INFO310: Human-Centered Design Process & Methods

GDP1: Framing a Design Problem

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Team 6

INFO 310-901

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Section 1: Problem Space

Design Problem:

Based the recent events occurring from the coronavirus outbreak, many Americans have been forced from their normal lives into one of isolation and social distancing. In many cases, these events have caused those affected to struggle to find factual information, maintain social communication, practice healthy living, and support relief efforts, among other things. In extreme conditions, data reports increased suicide cases as a result of the isolation which results in countless number of lives lost apart from the coronavirus pandemic.

Due to the number of lives being lost, it becomes of the utmost importance to approach this issue and attempt to solve the problems by providing the societal community with information for such resources in order to sustain during this outbreak period. Additionally, since the coronavirus spreads through social contact, the system aims to provide users with resources that can sustain their social lives by substituting physical contact for virtual contact. With the Disaster avoidance Initiative through Virtual Objective Communication (DIVOC) app, those affected from the pandemic will be able to maintain a sense of normalcy in these uncertain times.

Unfortunately, due to the rapid spread of this virus, few solutions exist at this time and no environment tackles all of the issues, mentioned above, that Americans face during these times of trouble. While Google and Apple are developing apps in response to the coronavirus, these apps are made to share information about contact tracing after a person has already come in contact with someone testing positive for COVID-19. These apps fail to take initiatives to slow the spread, share information about preventative measures, or create a sense of normality in American lives.

In cases where some apps do attempt to take a step towards sharing information on preventative measures, they do so in a way that presents factual information in an untidy manner instead of providing the society with resources or suggestions to better guide themselves during such time. An example of such an application is a web-based program by Johns Hopkins University which tackles the spread of current, factual information, though the way it is presented is highly cluttered. This approach also fails any attempts to create any form of social interactions. The other issue that can be considered within the mentioned problem frame is the lack of communication between doctors to facilitate treatments or collectively identify characteristics of the virus to gain more knowledge on it. Hence, the user reach of the system can be expanded to not only accommodate the patients or the general public itself, but also the doctors or medical community as needed.

Bug List:
Google Contact Tracing Application:
- This application is used in response to the coronavirus outbreak. While stay-at-home orders were given by many local and state governments, some travel is necessary, such as that of essential workers or to food shop. This app keeps track of interactions between people. In doing so it does not take preventative measures.
- This application does not attempt to create normalcy while social distancing and isolating, but rather monitors if one has come into contact with someone with the virus.

- The app uses Bluetooth to record when and how people interact. This is an invasion of privacy, which is protected as Americans.

Apple Contract Tracing Application:
- This application too is in response to the coronavirus outbreak. This app works on contact tracing for improved record of who has tested positive for the COVID-19 virus and when. Thus, working in a containment manner, rather than a preventative manner.
- The application does not allow for interactions between two individuals to take place outside of a physical interaction.
- This app does not provide a means of informing the population on the current state of the Coronavirus pandemic.
- This application does not work to improve the lives of those currently in isolation and social distancing.
- The Bluetooth used to record when, where, and how people interact is an invasion of privacy, which is protected as Americans.

Apple COVID-19 Screening Application and Website:
- This web-based application is a tool serving primarily as a hub of information and a device to guide you in beating this virus, however no information is clearly displayed in this minimized layout leaving users to search several tabs for their information.
- The information presented does not display when the last update was. The application declares it is in partnership with the CDC. Since the CDC has been updating their guidelines, there should be a posting on when the latest information was posted.
- Navigating between different pages is clunky and difficult. For example, the application aspect allowing for guidance and screen takes you to a separate environment. In order to get back to the original page you must use the back button on your browser not the one provided in the window. Additionally, when navigating the information pages provided, you must scroll all the way back to the top to return back to the home page.

Johns Hopkins Coronavirus Resource Center:
- Shows the data of the spread of this virus through highly informative graphs and representations. These graphs can be seen as cluttered depending on the size of the screen it is being viewed on. A mobile view is provided as part of the system but is not integrated. A user needs to separately click on another link to visit the mobile view of the provided interactive graph.
- Interactive graph consists of way too many components and information for the user to comprehend. Distinct graphs indicating deaths, active cases, state-level data should be presented in a separate manner (one at a time) through the use of a dropdown menu selection or other components to separate data.
- Some national guidelines imposed by the government are not consistent or applicable to the state-level information provided in the news category; it causes misunderstandings and confusion. A new state-level page can be made (with

redirection in place) to segregate national released orders with state-level ones as part of the news feature.
- Dashboard page consists of multiple cue-card components which require the user to scroll down to be able to see the different features offered within the system in terms of data presentation. These different topics listed on the cue-cards can be included in the menu bar so that it's simpler for the user's navigation and ease of access to information.
- Dashboard page consists of three different buttons on the interactive map which navigate to the same animation or map, this increases repetition and redundancy which is unnecessarily introducing complications to the webpage hierarchy when it can be simplified. Hence, it should be reduced to a single button which navigates to the specified page rather than having three.
- Users need to scroll down a lot on the dashboard page to get a glimpse of the COVID-19 basic information for prevention. Since this information is important, it needs to be at the top of the page, so that it captures the user's attention at the first glance and gives them prevention tips as needed. This information can be displayed in a scrolling panel component in the sidebar with each separate tip redirecting to a different webpage with more information provided.
- The system offers the users a capability of subscribing to different newsletters which would let them know of any newly announced information. The process of subscription includes scrolling down to the dashboard page and navigating through three different web pages to subscribe to a service. This should be reduced into a one-step process (which is mentioned as part of the top menu-bar of the system) where a user can simply click and subscribe to a thread and fill out the information as needed to receive updates through email/phone.
- Links and information for live events that are mentioned for user involvement and participation are somewhat hard to find. As mentioned before, to increase user interaction, the link or information to such events should be as part of the dashboard landing main page which captures the user's attention on the given events.
- This application is primarily a means of displaying data through the use of graphs and bar charts. The user-interactions offered in the system are very limited which mostly just change the data which is displayed. Rather than just providing users with information only, the system can aid people in interacting socially by providing them with other resources such as fitness for well-being, entertainment, and online consultation with a doctor or therapist if needed.
- This application does not include groups other than patients or the general public. The importance of including doctors in the given system is an important one since it would allow doctors around the world to communicate with each other about the effectiveness of different medications or treatments or even share characteristics discovered about the virus which can build upon the shared knowledge in the community. Discussion forums can be implemented within the system to facilitate such interactions. A new user profile can be introduced which allows doctors to sign-in and creates a space where doctors can refer to each other's advice to devise a protocol for effective treatment.

Section 2: Data Gathering

During the current times, in order to gain proper information about the current essential needs of Americans during this unprecedented time, we plan on using several data gathering techniques. As the DIVOC app will be primarily used in a social distancing setting and current governmental orders restrict unessential travel, our means of data gathering will be limited to that consisting of virtual communication and correspondence. To ensure that our application is applicable to both the individuals and groups, we will be allowing participants to submit their responses individually in addition to as a group.

With efforts to include other user groups as part of the system as well (to enhance the user interaction), we would design two different questionnaires/interviews that allow us to separately identify potential interactions that can take place for the use of the general public and the doctors as well. A few doctors' opinions will be consulted as part of the process to identify how the interaction between the medical community could be reinforced through the use of this system. By developing a better understanding of the needs of these different user groups itself, we would be able to construct a platform which would also benefit from user interactions as a whole through the doctor's provided first-hand information and the general public.

As a way to gather information from an individual, we will be creating a survey that can be answered either directly by the participant or in the form of a virtually conducted interview. This method will give participants the ability to share what they personally expect and require from the app without interjections of anyone. Since the DIVOC application will be used primarily by individuals over groups, this method of information gathering will prove itself vital. In attempt to gain the most information possible from the participant, surveys will be conducted both as forms and interviews. In the interview setting, those conducting the survey will be able to ask a participant to expand on their reasoning to their response. Surveys would consist of responding to data which would help us better understand how the current systems are responding and what sort of interactions they are missing which can be incorporated. The form will be a method for those that may feel more comfortable expanding on their reasoning in the form of writing rather than conversation. Due to COVID-19 currently limiting communication to forms of video calls and text conversations, we find that both methods of data gathering on the individual are justified.

In order to gather information on groups that would be using the DIVOC application, as well as providing a space for ideas to be passed around and developed, we will be also conducting focus groups. Similar to individual interviews, we will be creating virtual meetings through use of Zoom, Google Hangouts, or similar software to conduct focus groups. We believe that in using this method we will directly see how effective current virtual communication software is used and what improvements can be made when developing the social aspect to our application. Additionally, it is our belief that in focus groups, participants may be reminded or feed off of other ideas within the group.

Section 3: Individual Contribution Breakdown

Brandin Bulicki:
- Section 1:
  - o Design Problem:
    - Amount of Contribution: 60%
    - List of Contributions:
      - Composed the majority of the problem statement
      - Developed the reasoning behind the DIVOC application and how it is a necessity
  - o Bug List:
    - Amount of Contribution: 50%
    - List of Contributions:
      - Found the Applications used to create a bug list
      - Identified 'bugs' in the Google application and the Apple Applications
      - Aided in the 'bugs' found within the Johns Hopkins Application
- Section 2:
  - o Data Gathering:
    - Amount of Contribution: 60%
    - List of Contributions:
      - Composed the majority of the Data Gathering techniques section
      - Developed the reasoning behind the methods decided upon
      - Further explained the information gathering from individual users and group users

Harsh Sharma:
- Section 1:
  - o Design Problem:
    - Amount of Contribution: 40%
    - List of Contributions:
      - Added upon the mentioned problem of the coronavirus and how it is affecting the society
      - Described the problem in terms of the lack of information or approach provided within the existing systems
      - Briefly defined how a new system can be designed in order to address the mentioned failures and improve user interaction such that the system can be used as an information tool and on a daily basis by users
  - o Bug List:
    - Amount of Contribution: 50%
    - List of Contributions:
      - Described the Johns Hopkins system and how it currently addresses the coronavirus pandemic situation

- Identified stylistic and design related issues within the system which could be improved to enhance interaction
- Devised a plan of how a new user role could be incorporated within the system to maximize interaction and involve different individuals
- Section 2:
  - Data Gathering:
    - Amount of Contributions: 40%
    - List of Contributions:
      - Added upon the mentioned data gathering techniques and briefly reasoned on the choice
      - Described how the survey/questionnaire data gathering technique would be executed under different user roles to effectively gather a list of user interactions

Section 4: References

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