User Requirements Document

Project Team:

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Project Context, Expected Deliverables, and Scope:

1.

a.

The high level motivation of our project is to create a web dashboard that provides local and relevant COVID-19 information targeted for users who are 65 or older. The modern news and media sources can often be difficult to keep up with for the younger generations, but especially more so for older citizens who are not as fluent in multimedia technology. As one of the groups most vulnerable during the pandemic, it is essential that people 65 and older receive accurate updated information about the state of the virus in their communities that presents in an easily understandable/accessible format. Overall the high level benefits of this project would be the disruption of the constant barrage of information that is normalized in our society by providing succinct summaries of recent news and aiming to lower disinformation as well as increase user interaction with a demographic often forgotten.

b.

Our web dashboard design will be uniquely designed for our intended user base: the demographic of American Residents who have access to the basic internet and are of the age 65+ in Michigan. Our project will simplify the process of gathering news relevant to our user base, both in age and locality, delivering the information over an intuitive interface that is accessible to the hearing and visually impaired. These include features such as text to speech support as well as large fonts and focus driven displays. While there are few lower level competitors in the COVID-19 data aggregation market, we are unique in the level at which our product will curate the information for our select user base as well as our level of dependence

upon regulatory agencies such as the CDC in order to maintain as unbiased information as possible.

2.

a.

Our initial deliverable will consist of two components, our web dashboard frame implementations and our data aggregation pipeline. These two components of the deliverable will form the important structural basis of our project. Our web dashboard frame should be fully implemented and coded within Github Pages such that it has functionality to take in user input and display concurring information. Our data aggregation pipeline will consist of a set of web scraping models and data structuring models in order to comprise the database of COVID-19 information that will populate the website. Once this important deliverable is complete, the rest of the project consists of the fine tuning and joining of these components to achieve a final realized web dashboard. Here is a more detailed deliverable design framework

<u>Initial Deliverable</u>

1. **Web Dashboard Frame**
    a. Implemented in Github Pages with HTML, CSS, JS
    b. Has four User Selection Boxes for user input of [age, location, health_status, gender]
    c. Has functionality to return tailored information on page given differing User Input
2. **COVID-19 Data Source ETL**
    a. Have four web scrapers built to be tailored to our four web sources [explained in part d]
        i. Each web scraper adds feature data, ‘keywords’ for text data corresponding to user selection boxes above.
    b. Have web scrapers output structured website text and relevant ‘keywords’ to single aggregate csv.
        i. Preliminary Data Columns [Date, Title, Location, Text, Keywords, Permanence]

b.

Our potential stretch goals largely follow the added functionality of our web dashboard.

Our initial design includes local information for the state of Michigan, however given the opportunity to stretch, we could increase this functionality for our user base in other states. Additionally we could continue to add features, such as email updates, or easy print exports for the information to continue to make the product more comprehensive for our user base. The final stretch is to implement updates to the website's database of information in real time which would involve degrees of web hosting and higher level web scraping models

c.

Our current scope of the project is very much within our level of expertise and time allotted for the semester. Our Web Dashboard will largely focus on displaying information, with the interactive element being user selection boxes to narrow the focus of information towards the user. Our UI design will consist of simple and easy elements to implement such as less crowded information on each screen, or larger font sizes. Our database itself will rely on well documented primary web sources [explained in part d] scraped for very specific information and keywords that apply to our users such as 'senior', 'elderly', etc. We aim to fine tune these product features rather than extend the scope further in order to vastly drive the quality of the final product rather than the quantity of numerous additional features. Current topics that are out of scope for this topic involve the use of high level computing power and/or machine learning in order to scrape websites in real time and tailor information to each specific user beyond the normal [age, location, health_status, gender] user input variables. Additionally we do not have the funds to host our own website/servers and Github Pages thus has limitations on the creative freedom of the website design.

d.

Initial Study and COVID-19 Database sources for Deliverable

The Literature and sources that we are scraping for COVID information are all direct governmental sources, chosen for their access to information and lack of bias.

Our initial and largest source will consist of the Center for Disease Control and Prevention's page for COVID-19 [5]. The CDC excels at delivering updates and information with regards to COVID prevention, symptoms, vaccination and testing from a *human-viral biological sciences scope*. As such, there is ample information and further links to their literature in which we can obtain detailed information on the procedures and science behind testing, quarantining,

maintaining social distance, etc [5]. such that they are being performed to their highest level of efficacy. In addition, the CDC website excels in tracking case data (case counts on the homepage with their own inbuilt data tracker) as well as specialized COVID info for ranging demographics/locations such as Children, Health Care Professionals, Public Transportation, etc.

Another source compiled from scientific literature is the Coronavirus page of the Environmental Protection Agency [6]. The EPA provides an additional interesting side of information largely focused on the *scientific, non-human factors of COVID*. The page comprises updates as well as articles/literature on topics relating to the interaction of biotic and abiotic environments in COVID. For example, the EPA page currently contains directives on Disinfectant Use, instructions on how to filter and clean Air from COVID, virus concerns with water/wastewater, and updates on antiviral products/materials [6].

In order to obtain more specialized location specific sources of COVID literature and information, we also look to local governmental websites such as Michigan.gov [7]. These sites are very well suited for the most recent information and updates for COVID spread/strategy on a local level. In addition, these sites excel and disseminate structural and legislative information that would pertain to our project consumers. Michigan.gov currently shows recent updates on vaccine deployment in Michigan, more details into gathering guidelines/ quarantine orders, as well as relevant directions on how to get locally tested/vaccinated [7].

Finally, our final source for live COVID information comes from the University of Michigan itself, being both a hospital system directly in charge of testing and vaccination, as well as a public academic source of information. Michigan Medicine's webpage for the Coronovirus excels at not only delivering local directions for covid concerns, but also directions for proceedings in the perspective of a health system [8]. They are a primary source of vaccine deployment and thus their vaccination scheduling estimation is very accurate. On the page there are many specialized COVID articles regarding pregnancy, instructions after receiving the vaccination, how to care for someone with COVID, and symptom/treatment information [8]. This source will be invaluable as a final reference for COVID information in our dashboard.

Web Dashboard Technology and Solution Concepts for Deliverable

Web dashboards are graphical user interfaces that efficiently deliver information to a user. The data visualization and progress reports a dashboard provides will be essential in minimizing confusion with elderly users that use our website. It will be important to develop a solid

dashboard because it has the ability to generate detailed reports that show new trends, the ability to consolidate all reporting into one location, and the ability to gain total visibility across all informational sources instantly [9]. In doing so, users will require less clicks in order to navigate around the website and discover relevant information that pertains to them. Because the dashboard is the first impression a user will have of our web application, it needs to be as receptive and informational as possible.

In recent times, several existing products that employ web dashboards for coronavirus information have been developed which fall under the same category as our project idea. Examples of competing products include the Johns Hopkins coronavirus tracker [10] as well as UK government coronavirus tracker [11], each of which employ a unique approach to relaying updated information regarding the coronavirus.

A quick first glance at the Johns Hopkins website shows that the most crucial and relevant information is all displayed on the first page without the need to scroll. This includes categories of information such as new cases today, total cases globally, total cases in the U.S, and total deaths. There is also an option to click a link which provides a 60 second summary of today's covid situation in video format, as well as an option to query the latest covid data in a user's personal country or state. The colors are clear and the overall display is minimalistic but easy to navigate. With our own product, similar to the Johns Hopkins dashboard, it will be important to have the most relevant information on the front page as well as a small number of links that open up to other important pages. To improve upon this competitor product, our dashboard will ideally place more emphasis on directing users to pages that have geographically relevant covid info as well as pages with information regarding vaccinations which the Johns Hopkins page does not include.

Looking at the UK government website, it is easy to see that once again all of the most important and up to date information is displayed on the front page without the need for additional scrolling. Unlike the Johns Hopkins website, the UK page does prioritize vaccination information such as the total number of people who have received the first or second doses. What our product will do differently from the UK site is put more emphasis on easily directing users to information about how they can receive the vaccination wherever they are located instead of focusing on vaccination statistics about the general public.

The design process of the dashboard will be an important part of the development cycle and building upon existing products such as the previously listed websites will aid in our efforts. We hope to create a dashboard that is as effective as the existing dashboards available on the web while also catering to the specific goals that we have set forth.

User Demographic Information with Academic Literature for Deliverable Design

Conducting research for this project demonstrated how necessary an informational website aimed at older users is. As of April 2012, 53% of adults aged 65 or older were online [1]. It seems safe to assume that this figure has only remained constant or increased over the past decade as computers and the internet have continued to permeate every facet of our culture. Additionally, over three-fourths of seniors own a desktop computer [2]. The notion that older people are not on the internet or do not want to be is simply false. The largest problem preventing seniors from engaging online is poor design made by typically much younger developers who either prioritize aesthetics over a smooth user experience or are unaware of seniors' needs. As a result, over 70% of seniors feel "less than comfortable" using technology [2]. As members of an increasingly digital society, it is important that older adults have resources that they feel confident using. Luckily, some best practices for this type of interface design have already been determined. For example, color contrast on a webpage should be maximized for readability and shades of blue or purple should be avoided [3]. Additionally, all text should be at least size sixteen font [4]. Even a glance at the COVID-19 informational page on the CDC website, found at https://www.cdc.gov/coronavirus/2019-nCoV/index.html, shows many shades of blue as well as rather small text (some of which changes from black to blue when hovered over). Clearly, this is not meeting the requirements of senior users. Our team feels confident that we can construct a better website with an interface meant for older users. Our relevant skills are listed in a later section.

High-level, Prioritized User Requirements Table with Target Values:

User Requirement	Priority	Specification	Measurement	"Not You"
Interface usability effectiveness	3	Success rate of 90% or higher	Task success rate will be measured by number of successful attempts / total attempts	Yes (user effectiveness tests will be determined by people not in our age range)

Interface task completion time	3	Average task completion time less than 10 minutes	Tasks will be measured in minutes and seconds for successful task completion	Yes (user effectiveness tests will be determined by people not in our age range)
Satisfaction	5	Average user score of 4.5 or above	CSAT (Customer Satisfaction Score) of users using the web application between 1 and 5	Yes (customer satisfaction score will be determined by users outside of our age range)
Bug Free	4	Average of 1 bug crash every 20 uses or less	Report any application breaking bugs among users, taking the total crashes / total uses	Yes (customer bug testing will be determined by users outside of our age range)
Software updates	2	No site breaking bugs before and after updates to interface and backend	Run unit tests before and after update	No (updates to the website will not involve feedback of target audience)
Error management	2	90% or above of site breaking bugs must generate an error report	Calculate error messages / total bugs to ensure bugs are documented	No (bug handling will not involve feedback of the target audience)

Project Management Strategy and Plan Update:

Project Management Strategy Changes:

We currently don't see any need to make major changes to our project management strategy. However, there are several smaller changes that we feel can help aid the development

of our project in a way that can maximize our output. The first change that we want to make is regarding our team organization. We plan on having the entire team work on the User Requirements portion of the project. We found that this provides us with a better understanding of the user experience that we want to create and will prove beneficial for all members come development time. The second major change that we expect to make in the coming week with respect to our team organization is the role of the Infrastructure team. We plan on bringing all of our members on board to the infra team so that everyone gets a solid understanding of the underlying infrastructure on which the application is based. Of the two new members to the infra. subteam, Dhanuj Gandikota will only spend a small fraction of his time (~10%) working on infrastructure related tasks and Chandramouli Krishnan will be using a higher percentage of his efforts on the infra team (~50%). This is because we wanted to give Dhanuj an intro to Cloud Infra. and also leverage Chandramouli's background doing industry projects at Amazon Web Services to help get the technical side of the project kicked off.

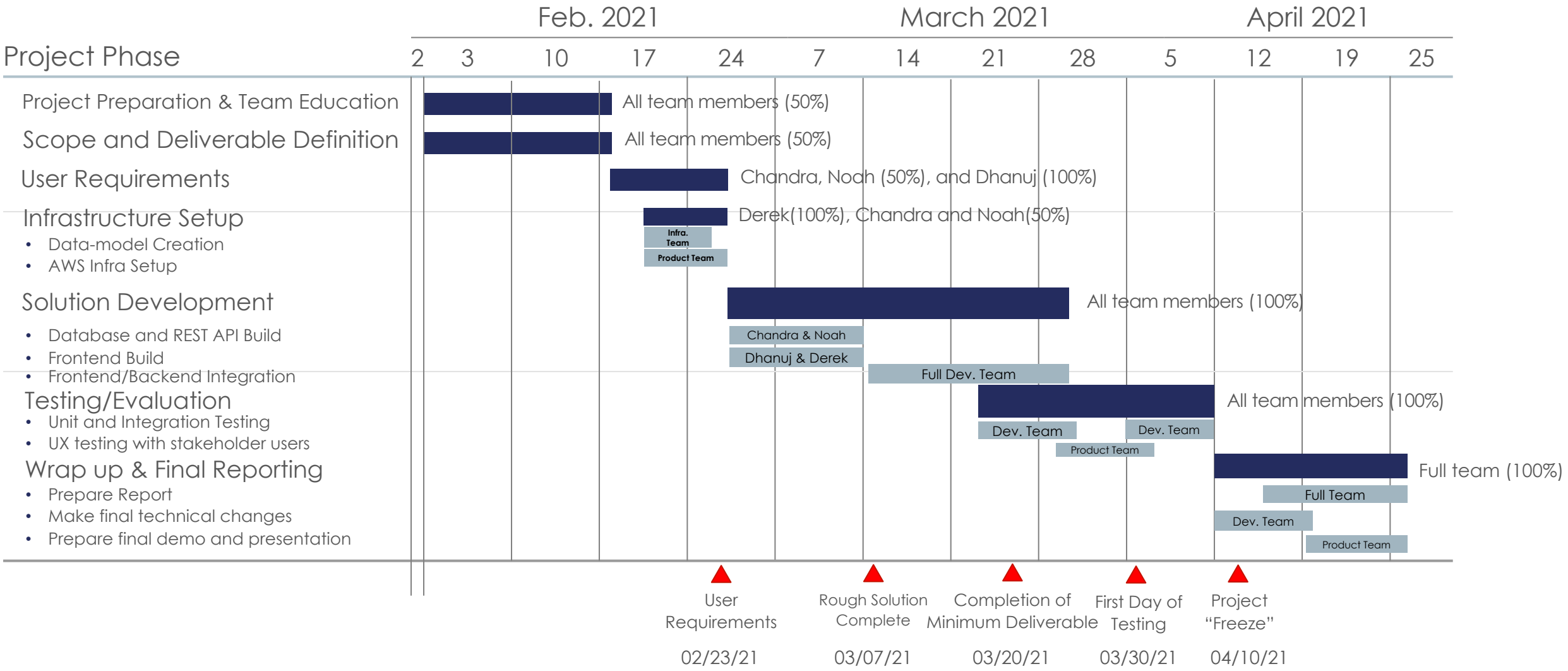
With respect to the roles and responsibilities of each team member, we wanted to make one slight change to incorporate changing skill sets in our team. From this point forward, the two immediate goals of the team are to get the infrastructure up and running and to curate content for the project. Hence, we will be shifting Chandra to the infrastructure team for 50% of his time as mentioned above. His background with AWS should prove to be useful in establishing the infrastructure for the application. We will also be having Dhanuj work 90% of his time curating content for the website. This will help to offset the burden of shifting Chandra to Infrastructure for half time.

Our primary working time has mainly been independent of our regular group meetings. Our workflow typically involves us meeting in a group setting and then quickly dividing up tasks based on the strengths that we listed in the project planning document and the teams that are listed both above as well as in the project planning document. After this the primary work is done independently of the overall group with regular check-ins during our working sessions every 30 minutes and general check-ins every 3 days. We typically will have a wrap-up meeting before a big deliverable where we will spend several hours bringing together everyone's independent work. This process is something that I don't see changing much over the course of the upcoming project. Something that we do want to begin to integrate into our working process is the idea of paired programming. We believe that we can accomplish this using both Visual Studio Code's live share function as well as a robust code review process.

Since we haven't begun the bulk of our development work yet, our primary accountability structure has been our group working sessions as well as the deliverable wrap up meetings that

we have at the end of each deliverable. In these sessions we were able to make sure that everyone is contributing evenly to the project and that the work being delivered is of high quality. So far, this has been made easier by the fact that our deliverables have been primarily written documents so we've been able to measure the amount of content and thought put into each of the paragraphs written by the different individuals.As we shift towards the development portion of our project there are two main methods that we want to use to ensure accountability and communication. The first is that we want to establish a high-quality agile process where we break down major objectives into individual stories which people will be able to develop and then commit into our Git Repository. This ensures that everybody is contributing to the project in a fair and equal manner. to ensure that we are maintaining the highest standards when it comes to our development process we will also be implementing a code review process. We will do this through GitHub’s built-in CR tool which will allow teammates to review each other's code and make sure that it passes high standards before it's merged into the production branch.

EECS 497 Project Plan and Milestones (User Requirements Doc)

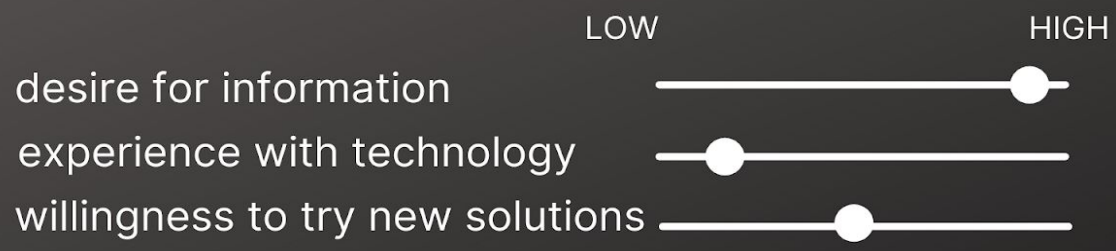


Primary Persona

Senior Citizen

- 65+
- lives alone
- unvaccinated against COVID-19

KEY ATTRIBUTES



GOALS:

1. Acquire up-to-date COVID-19 information
2. Find vaccination options in their local community
3. Maintain a sense of independence and personal agency

BARRIERS:

- Vision impairment
  - farsightedness, glaucoma
- Unversed with technology
  - discomfort with typical web interfaces

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