# CareConnect Technical Report

## Motivation

The motivation behind CareConnect stems from an increasing need for accessible and reliable healthcare information and services. In order to address this need, our team has decided to create CareConnect, which will be a website providing users with accurate and up-to-date information about illnesses, treatments, and medical providers. Our approach for these functions will be "Diagnose and Treat", where CareConnect will provide the connecting information needed to diagnose an illness, find treatments for the illness, and find medical providers for the treatment. With these features, we aim to provide users with the necessary tools to make informed decisions about their health.

# User Stories (Phase 2)

"As a user, I want to know possible side effects for each drug. I want to know the side effects of each drug, if there are any. If it depends on age, gender, weight, etc., I also want to know that information. I want to also know if the side effects are temporary or could be permanent in some cases." - We are actively trying to find data for these side effects through other APIs because we like this idea, but haven't been able to easily find any. We are unsure at the moment if whether or not we can actually do this even in Phase3.

"As a user, I would like to be quickly routed to a possible dispenser for whatever drug I'm looking for. I would like to be linked to possible dispensers/venders for whatever drug I want to buy. If it's prescription related, I can be routed to a CVS or Walgreens in my area. If it's over-the-counter, I can be routed to the closest store that would have it. If it's not available in stores or discontinued, I would like to be suggested alternative drugs or to contact a doctor for more information." - Our website is meant to provide healthcare providers you can go to in order to get treated for a certain illness or to be prescribed some medicine. This is the closest our website will get to drug dispensers.

"As a user, I want to see if there are certain illnesses I should be aware of that are "trending". I want to see if there are certain illnesses I should be aware of that are "trending", maybe based on seasons. For example, Covid-19 is currently a major illness that is spreading, so there would be quick information available for treatments and providers providing aid for people who test positive, etc. Another example is that it is currently flu season, so there would be quick information on where to get vaccines, etc." - We are actively trying to find out other APIs to scrape from if possible to obtain this information, but we are unsure if we will be able to find any. We agree that severity or trending is a nice attribute to have in our website and will continue to look into it.

"As a user, I want to filter my searches. I would like to be able to filter through drugs based on price, availability in my city, illnesses it can treat, etc. I would also like to filter through illnesses to find out which one I could have based on my symptoms. I would also like to filter through medical providers to see which ones are reliable or in close proximity to me." - We will add filtering and searching in Phase 3 as per project specifications.

"As a user, I would like contact information for healthcare providers to be available. I want to be able to either call or email them regarding more information for treatment. I would also like to know how each provider is rated on the healthcare provider page so that I don't have to click on each one to figure out which one is generally the better option." - Our API calls do not have information about phone numbers or contact, but by a simple google search of the healthcare provider linked to a drug or illness, users can easily find the contact.

# User Stories (Phase 1)

"As a customer, I want to learn know the health care plans available to me in my city. As a customer, I would like to have an attribute of location for the health care plans instances. I want to be able to filter them by city/county/state. It will also be helpful if I can get a best health care plan option for my city" - We are not in the aspect of health care plans, but rather illnesses, drugs, and healthcare Providors.

"As a customer, I would like to input any health issues I'm having and be recommended over the shelf medications that could help. Maybe even have nearby drug stores that hold these given prescriptions. Can filter using address or zip code." - We are actively working on filtering and sorting our health issues/illnesses and it will be ready for Phase3 as per project specifications.

"As I user, I would like to see the side effects of different drugs and their possible connections to illnesses" - As mentioned, we don't think we have the data through scraping our APIs to gether side effects, but we will continue to look into that for Phase3.

"As a customer, I want to search an illness and see related drugs needed. When I search up a certain illness, I should see a description of the top remedies, whether it is drugs I take or a certain treatment plan. I also want to see how many sources suggested each remedy. For example, for a common cold, a list of suggestions will appear (taking over-the-counter meds, resting, hospital visit, etc.) and the number of sources suggesting each remedy will be next to it. It would be nice if they are organized in descending order." - We are actively working on implementing searching and this will be ready for phase3 as per the project guidelines.

"As a user I want to be able to access the website on my machine. I would like to be able to access this project from a public website. As this project begins you will only be able to run the frontend code from your machine. As a user, I would like to see the production version of the application from my machine." - The website is now fully accessible by going to careconnect.works. At the time of this user story we had not yet started our website hosting.

# User Stories(For Developer Team - 10 total)

Cities Info - As a customer, potentially having some text on the city instances can inform me more about the city and some of its qualities. Some general information about the city can be good to have. The website looks great.

More pages - I think your website is very good in terms of design, layout, and functionality. The only thing I would like to see is more data scraped from API's to be put into your website. It appears that there are only 3 instances for each, but I think it would be fairly simple to scrape more from APIs and have more instances to get a better use of the website. Good Work!

Share Capability - I think the website has great implementation of API's, a neat design, and is following the requirements well. One thing I think you could add to MusicMap is the ability to share a card whether through the link or other integrations. I think this would require a share button with integration on share through which social media platform/just link.

More info regarding Artist - As someone who enjoys finding new music, I think MusicMap could have more information about artists. One of the additional pieces of information shown could be the best performing song of the artist. I like the popularity ranking shown of the artist.

More info on artists page - As someone who enjoys listening to music and discovering new artists, I think that the artists page could potentially have more information about the artist after clicking on the card. This can let users find more information about the artist and potentially go to their concerts. I like the song preview feature of the website.

Enable link under the artists tab to find more info - As a user who goes to many cities and concerts, I enjoy this website because I am able to find new artists and concerts in the city that I am visiting. However, I did not like the website's links to concerts and cities under the artists tab as I was unable to find any information through these links. If these issues were fixed, I think I would frequently visit this website to find concerts in cities near me.

More sorting/filtering options for the the models. I am a user who struggles to sort through a lot of information on my own. I enjoy using your site, but I notice that only the artists tab has a filtering option. If both the concerts and cities tabs also had sorting/filtering features my experience on the webpage would be a lot better.

Display Project Information on 'About' Page. As a customer I want to be able to get an overview of the website using the about page. Additionally, I would like to be able to see team members and GitLab statistics. I would want to see it in an aesthetically pleasing tabular format with team images, introductions, and statistics.

Images Loading - As a customer who is looking for artists and concerts/events, I am very passionate about creativity. Everytime I load the website the pages take a very long time to load, especially the images. This almost makes me not want to continue using the website. Please consider loading the images first/faster for a better loading time.

Homepage/Landing Page - As a customer, I think the homepage for the website can be tweaked a little bit to be made more professional. Overall the images are good but the information on the sliding banner with 3 pictures only has text on one of them. I think this could be changed to be on all three of them. Additionally, I think the website is almost small enough to not be scrollable, but is barely too long. Consider adding some more information at the bottom of the home page or reducing some information in order to avoid the slightly scrollable aspect of the website.

## RESTful API

The RESTful APIs being used are the WHO Athena API for illness information, the FDA Drug API for treatment drug information, and the NPPES Medical Provider API for treatment provider information.

Postman Documentation:
https://documenter.getpostman.com/view/25858087/2s93CEvG3i

The above documentation contains information on the endpoints, descriptions of what they return and how they work.

## **Models**

We have three models for the website:

Illnesses
- Estimated Instances: 150
- Attributes: Description, Year, Region, Country, Value, ID
- Media: Images, maps, news
- Connection to other models: Drugs that can be used and health care providers that can provide care

Drugs
- Estimated Instances: 700
- Attributes: Company name, dosage form, brand name, marketing status (prescription, over the counter, tentative approval), id
- Media: Images, social media (twitter) or text
- Connection to other models: Illnesses that can be cured and health care providers that provide care (including pharmacies)

Healthcare Provider
- Estimated Instances: 1000
- Attributes: Taxonomy description, Individual Providers, Organizational Providers, Name, City, State
- Media: Google Reviews, Images, Google Maps
- Connection to other models: Find specialists for illnesses that can prescribe drugs

**Tools**

The tools we have used in this project are Bootstrap, AWS, Docker, Postman, React, Gitlab

We used AWS in two cases. One was to host the website using Amplify, and the other was to deploy the backend using EC2 and use amazon rds for the database.

We used React as our main framework for the front-end of our application and it has enabled us to create a much better looking app than Phase 1 due to the in built css and js functionality with React.

We also used GitLab as our repository and tied it with continuous integration in AWS for constant updates. We utilized different branches for different aspects of the project. We also made and closed issues as per the project guidelines.

We used Bootstrap to help us with the front-end portion of the project and utlitized many of its tools to make it easier to create the front end as well as make it more clean than basic html/css.

We used Docker to create our build image and it is currently up and running and available to view on our gitlab.

We used Postman to create the documentation for our API as well as testing some other aspects of API functionality and input/output.

WHO API - The WHO Athena API is a web-based API provided by the World Health Organization (WHO) that allows authorized users to access information about medical products, including medicines and vaccines. Athena stands for "Adverse Events Terminology Harmonization and Management".

OPEN FDA API - The goal of the project is to create easy access to public data, to create a new level of openness and accountability, to ensure the privacy and security of public FDA data, and ultimately to educate the public and save lives. The concept was to index high-value, high priority and scalable public-access data, format and document that data in developer and consumer-friendly standards, and make that data available via a public-access portal that enables developers to quickly and easily use it in applications.

NPPES Medical Providor API - The NPPES Medical Provider API is a RESTful API (Application Programming Interface) provided by the National Plan and Provider

Enumeration System (NPPES) which is a public registry of healthcare providers in the United States. This API allows authorized users to access data about healthcare providers such as physicians, dentists, and nurses, including their NPI (National Provider Identifier), taxonomy codes, addresses, phone numbers, and more.

## Hosting

The site is hosted on Amazon AWS Amplify and our backend is deployed on Amazon EC2. Our domain was acquired through name.com and set up using Amazon Route53 Nameservers.

**Phase 2 Features**

The main things we did during phase 2 was to actually scrape the data from the above mentioned APIs and store them in a database. We used flask to create our own API endpoints and functionality. We also used a mysql database on amazon rds to store the data that we scraped. For pagination, we have added two query parameters to the https://api.careconnect.works/drugs, https://api.careconnect.works/illnesses, and https://api.careconnect.works/healthcare-providers endpoints : page and perPage. If the page query parameter is specified and the perPage isn't, the api returns a default value of 12 instances. Apart from the backend, we also switched our hosting from s3 buckets and Route53 to Amplify with an automated Route53 and now our front-end automatically gets https certificates and deploys as we commit changes to our branch continuously.