

SW Engineering CSC648/848

Fall 2020

Code: “Coronafirus”

Section 02

Team 01 Members:

Thomas Abadines (Team Lead) (tabadines@mail.sfsu.edu)

Vito Gano (Project Manager) (vgano1@sfsu.edu)

Souhib Trabelsi (Github Master)

Junhao Zhai (Backend)

Amily Wu (Document Master)

Trung-Duong Pham-Vu (Front End)

Milestone 1

09/22/2020

Revision: v.1.0

(Submitted: 09/22/2020, Revised: N/A)

1. Executive Summary

Our team is building a web-based application that solves the issues that we face in California. Our application is called “Coronafirus”, and its overall functionality is to resolve the two most important concerns that California is facing now, wildfires and COVID-19. With web-based applications showing up, hoping to help people in need of information as well as evacuation routes to hospitals and shelters, it is necessary more than ever to have the right and proper application to help resolve these issues. Unlike other applications that are currently in the market at the moment, we dedicate ourselves in not only providing the latest updates in regard to COVID and the wildfires, but also make the UI functionality and the interface a lot simpler and easier for individuals. With these events taking the nation by storm, we are doing our utmost best to alleviate and potentially resolve the issues that ensue in the state of California. Although our web-based application is only confined within the state of California, we may also consider expanding our oversight of the concerns that we are trying to resolve in other neighboring states that face the same situation as us.

In the web-application Coronafirus, we aim to help the individuals who seek information as well as provide emergency services for those who are in need of not only evacuation from wildfires happening nearby them, but also hospitals for people who seek suspicions about their health and their potential contraction of COVID. In our web-app application, we are looking into providing up-to-date news regarding these two issues in the state of California, as well as provide an interactive map that will show where the latest fires are, the number of cases of COVID for each county, the nearest hospitals and shelter areas for wildfires, and finally detailed numbers pertaining to these issues like number of deaths in COVID or the wildfires, or the number of homes destroyed and such.

Our group, Team01, is composed of 6 SFSU students who seek to address and resolve the COVID-19 and wildfire issues that we are currently facing now. We are a multicultural group that have individuals who came from different backgrounds and different aspects of life, and our diversity helps us understand one another. Despite having zero experience in regards to having the in's and out's of how web-server based applications function, we are doing our utmost best to not only learn the methodologies for making great web-server applications, but also establishing an application that can not only cater to the many individuals who are in a constant need of up-to-date communication regarding these issues, but also allowing many higher authorities who have the information pertaining to COVID-19 and the wildfires to update the information so individuals can have the latest updates to these issues.

2. Personas and main Use Cases:

1. Counties Health Directors

A county health director is a person responsible for the overall management of public health care programs and organizations in their county. An important characteristic and skill for a county health director to have is the characteristics and skills of a leader: integrity, the ability to delegate, effective communication, self-awareness, flexibility, problem-solving, influence, empathy, courage, respect, organization, responsibility, and multitasking. County health directors also need a good understanding of business tactics and marketing. Their job consists of managing staff, implementing strategies and having a passion for planning programs that benefit the public's health, safety and well being. Currently, their goal is to inform, and advise to their public county the current health situation, by reporting the latest statistics relating to the growing/depleting cases of COVID-19 and asking the public to follow stay at home orders, wearings face mask when going outside, social distancing, and self quarantining. A pain point

for the county health director could be the metrics used for the statistics on input. They may want more variety.

Use cases:

1. County health directors are allowed to enter and update numbers of cases and deaths from COVID-19 onto the website. To enter and update the numbers, they need to login first.
2. County Health directors who are new to the website want to login and have access to updating the number of cases for COVID-19. To register, they need to notify/contact the administrators to receive their account. The administrators will hand them a premade account with County Health Director privileges and features.
3. County Health Directors who want to look up the different counties for COVID cases/Wildfires impacted areas/Hospital locations/Evacuation center locations can search it up the same way general/normal users can.
4. County Health Directors can determine whether a certain area/region requires a shelter-in-place. They send the instruction and information on where the shelter in place should take place. The administrators will receive the info and verify and then make the announcement go live on the website.

2. County Fire Directors

A county fire director is a person responsible for the overall management of the public fire safety services and resource management in the county. They are in charge of investigating and reporting the causes of the fires, preventing the spread of wildfires, and protecting life and property related to the fires. To ensure fire safety, they enforce fire-related laws in state-owned or operated buildings, investigating fires in California, licensing those who inspect and service fire protection systems, approving fireworks as safe and sane for use in California, regulating

the use of chemical flame retardants, evaluating building materials against fire safety standards, regulating hazardous liquid pipelines, and tracking incident statistics for local and state government emergency response agencies. Characteristics and skills that are important to a County fire director include: integrity, communication, flexibility, adaptability, tolerance, responsibility, selflessness, knowledgeable, problem-solving, and accountability. Pain points for County Fire Directors and could be the metrics used for the statistics.

Use cases:

1. County Fire Directors who want to add data related to fire in their respective country can do so by logging in to their account first then they can input the wildfire/fire statistics.
2. County Fire Directors who want to look up the different counties for COVID cases/Wildfires impacted areas/Hospital locations/Evacuation center locations can search it up the same way general/normal users can.
3. County fire Directors who want to look up the different counties for COVID cases/Wildfires impacted areas/Hospital locations/Evacuation center locations can search it up the same way general/normal users can.
4. County fire directors can determine where a certain area/region in the county requires an evacuation level. They send details of the wildfire/fire and select the evacuation levels based on their informed, professional judgement on the severity and danger that the active wildfires can bring to the public. The administrators go over it and then post the evacuation alert or level.

3. Administrators

Administrators are in charge of organizing and managing the flow of information coming into the website. Their goal is to ensure the accuracy and value of the information, deleting inappropriate messages/misinformation and protecting the environment and reputation of the

website from inappropriate users. Important characteristics and skills for administrators to have are organization, communication, teamwork, responsibility, supervision, management, delegation, fairness, problem-solving, and giving support and assistance. Due to the responsibility of this job like deleting users and items, it would need people who would qualify with all these characteristics. Pain points for Administrators can be the guidelines for deleting users and items or the methods to delete them is confusing or disorganized.

Use cases:

1. Administrators require an administration panel where they can filter which data to see.

This way it is more organized in an orderly fashion and reduces disorientation and confusion in the group.

2. Administrators can manage the data related to fire and coronavirus. All data/items/users need to be approved or modified by the administrator. This will allow a double check to confirm/verify the right information is going to be posted and settle any unwanted/inappropriate information before going live.

3. Administrators have the authorization to trigger alerts according to state guidelines.

Once again this is for minimizing the errors before going live. Triggering alerts have several alert options: Evacuation level, Evacuation center location, shelter-in-place, Hospital locations, and Overcrowded Health facilities.

4. Residents of California

Many residents of California will definitely rely on the information that is being passed in our application. The user base of the residents of California can vary, as there are many different backgrounds of individuals like working farmers, or even senior citizens who might want to have the information needed to tell their grandchildren and their families nearby. The goal for the residents of California is to ensure that the application is working properly and is working as

intended. The residents can also report issues that they find in the application to the developers.

In terms of skill, residents can be expected to have a tutorial on how to use the application as there could be a wide array of skill levels for individuals who might have no technological experience.

Use cases:

- Residents can search on our site if their county has fire issues.
- Users who want to report issues can fill out a questionnaire relating to the bug or problem

5. People whose relatives are studying in California

Relatives of these people may be studying at a California university. After the early COVID-19 outbreak, many international students may choose to stay in the United States to complete their studies. As the number of COVID-19 continues to rise, the living environment of their families in California is very worrying. With the occurrence of wildfire, the life of their family members became more worrying. They need to understand and keep track of their lives. If there is no similar software to help them understand their loved ones, they may have excessive mental stress. And this software can also help some parents decide whether to let their children come to California to study. If some parents can understand the progress of COVID and wildfire in California, they may feel more at ease to let their children come to California to study. This type of Persona is not only limited to international students, but can also be used by parents of children from other states. With these help, they can better care for their loved ones.

Use cases:

1. Many Chinese Students were sent out to the US for college education because by their high school program, in order to monitor whether their living condition, air quality and COVID Risk, they need to log in to our website to find the info.
2. To better help students with deciding which county they can stay for a closer and proper distance to stay from their school so that they can reach school with a proper time that it takes to go to school
3. They also have access to their relative's account which means that they can push and remind their relatives of the weather changing and the increase of COVID-19 amount

6. Evacuation Centers/Hospital Directors

Evacuation center directors are in charge of organizing, coordinating, and providing an environment for first aid care and safe shelters and accommodations for victims of wildfires, natural disasters, and emergencies. Their job included working with staff in managing the centers. Hospital Directors are also in charge ensuring smooth operations of health facilities by managing staff, providing guidelines and protocols for the staff, and maintaining computerized records storing data, and reading reports. Important characteristics and skills for Evacuation Center and Hospital directors to have is: communication, critical thinking, problem-solving, cooperation, good judgement, instructing others, responsibility, integrity, and knowledge. Pain points for Evacuation center/Hospital Directors are waiting for their alerts to be updated in time for the users to see. Another sending information with more details to the general users.

Use cases:

1. Evacuation Centers/Hospital Directors can send notifications when their specific facilities are overcrowded. To do that they need to login first. Once they login they can access their user to send their notification
2. To register and login, they need to contact the administrators and the administrators will hand them an account.
3. They also have access to general/normal user functionalities. If they want to look at covid cases/wildfires statistics and shelters/hospitals locations they can do so by going to the search.

3. List of main data items and entities

County Health/Fire Directors

Administrators

People in charge of evacuation centers and hospitals

Residents of California(standard users)

Wildfire cases metrics

Wildfire Levels

COVID cases metrics : Amount, County, Suspected case, Confirmed case,

Health facility locations: name, location, County,

Shelter locations: name, location, county

Overcrowded Alert: level,

Wildfire Alert - Evacuation

COVID Alert - Shelter in place

Bug Report

Fire : Level, county, Zip Code

define main terms, types of users, data structures and “items” or “entities” at high or logical (not implementation) level (e.g. name, meaning, usage, and NOT how the data is stored in memory) so it is easier to refer to them in the document.

4. Initial list of Functional Requirements:

1. Covid metrics input: Directors will be able to enter covid cases by county - be able to enter covid deaths
2. Covid metrics input: Directors will be able to enter covid recovered
3. Covid metrics input: Directors will be able to enter covid infected
4. Wildfire/fire input - Directors will be able to input number of wildfires
5. Evacuation Level - Directors will be able to set levels of evacuation for county (L1, L2, L3)
6. Search - Normal users should be able to search statistics for counties
7. Register and Login - Normal users should be able to register for site and get alerts for shelter in place and evacuation orders
8. Notify Alerts - Administrator should be able to trigger alerts for shelter in place or evacuation
9. Modify/Delete items and :users - Administrator should be able to delete inappropriate items or users
10. Log/Track - Site should have log to track activities/modifications made by users
11. Posting items/data - items will need to be approved by the administrator before posting it online
12. Alert + Health center location - Alerts will show nearby evacuation center and hospitals

13. Notify when Evacuation centers are Overcrowded/Full - Will allow people who run evacuation centers and hospitals to send notifications when centers are crowded. This will allow people who are at higher risk for corona to avoid places that have a high influx of people.
14. Manual Search Options - Allows users to sort by zip code or city through manual search
15. View Interactive map - Users that are doing a search can see an interactive map that displays where the latest location of the fires are, the number of cases of COVID for each county, the nearest hospitals and shelter areas for wildfire evacuation.
16. View statistics - Users that are doing a search can also see a more finely detailed description and layout of the numbers pertaining to the issues related to the number of deaths in COVID, Wildfires, Numbers of areas/homes destroyed and such...
17. Bug/Issue Reporting - Users who come across bugs or other issues with the site will be able to fill out a questionnaire in order to inform the administrators about the issue.
18. Filtering data - Administrators will be able to filter through the data on the site through use of an administration panel
19. Linking multiple accounts - Relatives of users will be able to request to be added to a user's account and push notifications to that account. Relatives will be able to send personal notifications to that account only. Requests will be screened and users will be asked before accounts are shared.
20. Notification customization - Directors will be able to send forms to administrators with all information they want to be sent out on the alert, the forms will directly show administrators what the directors want to be sent out on the alerts.

5. List of Non-Functional Requirements:

1. Application shall be developed, tested and deployed using tools and servers approved by Class CTO and as agreed in M0 (some may be provided in the class, some may be chosen by the student team but all tools and servers have to be approved by class CTO).
2. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of two major browsers
3. Selected application functions must render well on mobile devices
4. Data shall be stored in the team's chosen database technology on the team's deployment server.
5. No more than 1000 concurrent users shall be accessing the application at any time
6. Privacy of users shall be protected, and all privacy policies will be appropriately communicated to the users.
7. The language used shall be English.
8. Application shall be very easy to use and intuitive.
9. Google maps and analytics shall be added
10. No email clients shall be allowed
11. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.
12. Site security: basic best practices shall be applied (as covered in the class)
13. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development
14. The website shall prominently display the following exact text on all pages "SFSU Software Engineering Project CSC 648-848, Fall 2020. For Demonstration Only" at the top of the WWW page. (Important so not to confuse this with a real application).

6. Competitive analysis- make table and 1 paragraph

<https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

<https://www.sfchronicle.com/projects/california-fire-map/>

<https://covid19.ca.gov/>

<https://www.fire.ca.gov/incidents/>

Features	Coronafirus	CSSE Dashboard	San Francisco Chronicle	Covid 19 California gov	Fire California gov
Contains data about Coronavirus	++	++++		+++	
Contains data about fire	++		+++		++
Contains a map and charts	++	++	+	+	+
shows a progress of the coronavirus	+	+			
shows a progress of each fires	+		+++		
Sends alerts to users	+				

Coronafirus stands out from other solutions currently available by mixing on the same website information related to fire and coronavirus in California. Users will be able to visualize data through multiple charts and a map and receive alerts with state guidelines. California County Health Directors and County fire Directors will have the possibility to update data through an

administration panel. In addition, even local level governments that are under the counties can also update the info as well catering to the local people as well.

7. High-level system architecture and technologies used:

Listed below are software technologies that our team has decided on. These may be subject to slight change in the future, but will stay mostly consistent to continue to provide a solid experience for the end-user.

Server-side Technologies:

- AWS Services (through AWS Elastic Beanstalk)
 - AWS EC2 t2.micro (1x vCPU, 1gb RAM)
- OS - Ubuntu Linux 18.04
- Web Server - Python Flask 1.1.2
- HTTP Server - Apache 2.4.46
- Database - MySQL 8

Front End Frameworks / Additional Technologies:

- React.js 16.13.1
- React Bootstrap
- Google Maps API
- D3.js
- Google Analytics
- Lets Encrypt SSL

8. Team and roles:

- **Co-Github Master/Project Manager:** Vito Gano
- **Document Master:** Amily Wu
- **Front-End/Team Lead:** Thomas Abadines
- **Front-End:** Trung-Duong Kaimi Pham-Vu
- **Back-End/Co-Github Master:** Souhib Trabelsi
- **Back-End:** Junhao Zhai

9. Checklist: either **DONE** or **ON TRACK** or **ISSUE**

1. **[DONE]** Team found a time slot to meet outside of the class
2. **[DONE]** Github master chosen
3. **[DONE]** Team decided and agreed together on using the listed SW tools and deployment server
4. **[ON TRACK]** Team ready and able to use the chosen back and front end frameworks and those who need to learn are working on learning and practicing
5. **[ON TRACK]** Team lead ensured that all team members read the final M1 and agree/understand it before submission
6. **[ON TRACK]** Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)