SW Engineering CSC 648/848
Section 02

www.ASOPF.com

A Song of Plague & Fire -
WWW Site for Public Safety (COVID & Wildfire) for California
Team 05

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HISTORY TABLE

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9/22/2020	10/6/2020

Executive Summary

2020 has been a very hard year for everyone, especially Californian citizens. They had to go through not only the COVID pandemic, but the wildfires. With all the chaos going on locally and globally, people depend upon a reliable source of information to keep them informed as to what is happening in the world around them. This is why we are very pleased to introduce you to *ASOPF*, a web application we are currently developing to connect the people to the data that they need. The *ASOPF* website is a dashboard that will allow you to follow the evolution of the COVID pandemic and the wildfires in California.

In order to make the data as reliable as possible, we will allow the various counties' Directors of Health and Fire Departments, hereby referred to as "superusers", to enter metrics such as the numbers of cases and deaths (for covid-19) as well as the number of fires in the county with respective levels of evacuation (L1, L2, L3).

Our website will organize and deliver this data in a way that is most meaningful and impactful to individual users (citizens of California). As a user, you will be able to access all the data via different means such tables and interactive maps. The intent here being to make what is normally very dense & dry information become easily digestible and recognizable. With the visuals we provide through the website, we hope to create an experience where the user can take one glance, and know exactly what is happening. Additionally, our website will set up a way for users to receive notifications directly via email or SMS, or any other method of communication they choose. Our goal is to ensure that everyone is armed with the information they need to keep themselves safe and healthy.

Our team consists of 7 students from the Computer Science department as San Francisco State University. **Ufkun Erdin** is our Team Lead, we then have **Alexander De Charry** as Back-end lead and Github master, **Siddhi Rote** as Front-end lead, **Nicholas Handy** as Back-end lead. Finally, we have **Huan Nguyen**, **Erik Loza** and **Mohammad Razavi** as FullStack Developers. Funding for our project will mean funding a much-needed service in the information age: condensing and dispersing information in a way that is easily digestible, understandable, and immediately useful.

Personas & Use Cases

Juan The Mechanic -

Persona:	Use case #1 :
Johnny works in an auto shop. He works with his hands and likes to open machines up to see how they work. He lives a very basic and regressive life and it suits him. Johnny has a wife and two kids. His goals are to work hard, put food on the table for his family, and to keep his family safe and happy. Financially, Johnny is considered low income and needs help, he is struggling to make ends meet. With covid and fires happening all around him he is scared. He is not up to date with applications since he has no technological expertise. The only way he is aware of what's going on in his county is by word of mouth or newspapers. Johnny is worried	Johnny lives in an area where many people are diagnosed with covid-19. After hearing about ASOPF from neighbors he gets help and installs the application on his phone. Having the application on his phone, he gets real-time alerts and warnings, about covid-19 and fires in his surrounding area. While on this page, johnny learns about covid-19 metrics such as numbers of cases, deaths, and number of fires in the county. Now fully aware, Johnny can act accordingly to keep his family safe. By inputting some basic information, johnny will receive messages according to his county. He does not have to check his phone every day for this information. If there is a covid-19 warning or a fire alert, johnny will be alerted promptly and will have time to prepare and act.

Tim The Accountant -

Persona:	Use case #2 :
Tim lives a very alone and secluded life. He likes to spend his time playing video games, and browsing chat rooms. He lives vicariously through online social networks. He makes enough money to support himself and be happy but is considered low income. He has no family. He is very knowledgeable and his technological aptitude is very advanced. He can teach himself anything behind a computer. He has a very advanced PC, a laptop, a cell phone, and many tablets. Tims goals are nonexistent . He wakes up, goes to work, comes home, eats food, plays video games, then goes to bed. Tim is happy.	Recently fire outbreaks have been spreading toward tims apartment complex and he has gotten very worried. Luckily he has heard of ASOPF from browsing the internet. Upon entering the webpage he registers basic information and has access to maps,data,cases of COVID019 and wildfire evacuation levels. Tim is very skeptical at first since he does not like giving his phone number out to new applications. But he witnesses that county Directors of Health and Fire Departments are providing the information solely to help the public; he feels much safer and completes the registration. ASOPF sends Tim alerts and warnings directly to his phone and since all of his devices are linked with the same account; he is able to see the warning about the fire near his house. ASOPF gave Tim proper time to plan his evacuation by showing the closest shelter or a shelter-in-place warning.

Sasha The Senior

Persona :	Use case #3 :
Sasha is 80 years old. She is an old soul, experienced, and mobile. She recently got out of the hospital and was checked into a nursing home. Sasha loves her family although they only come and see her once a month. Sasha has a very old flip phone that she only uses to call her family. She is a knowledgeable woman but technology is advancing too fast for her to understand. Sasha's goals are keeping her mind and body healthy. She does this by reading and exercising. The nursing home has a PC that Sasha has learned to use. Recently she was reading an article online and heard about the wildfires around her current location.	Sasha learns that by entering her Phone number into registration she can receive alert messages to her old flip phone that will alert her of the evacuation level of the county in regards to wildfires. She also feels safer seeing all the current cases of covid-19 in her current county. On the other hand, Sasha's family are worried that they will not be alerted if there are any fires or increased covid cases in her area. By inputting their phone numbers, Sasha's family can also get the same alerts as she does. Although Sasha is in a nursing home, she has a clear state of mind knowing important information regarding disasters in her county and local area.

Jackie The Student

Persona:	Use case #4 :
Jackie is an aspiring medical student. Her goals are to become a renowned doctor, and help all her patients. She is extremely knowledgeable, and is always informed. She is online and has twitter and facebook. In her free time she enjoys reading medical journals and world news online. Jackie is curious about all the new covid cases and wildfires in her area because it is affecting her education and livelihood.	Jackie knows there is a more efficient way to gather all the data she needs regarding covid-19 cases and wildfire evacuations. Normally she has to go on many different sites in order to obtain covid-19 metrics such as numbers of cases, deaths, and number of fires in the county. While browsing; Jackie comes across ASOPF , she realizes that all the important data regarding her county are displayed on one website. Since jackie is a student and does not always have a PC around to use, she is able to get live alerts on her phone, and link her Twitter and Facebook account to ASOPF. By receiving alerts via text/email, Jackie does not have to blindly search for critical warnings/evacuations.

Eli The Fireman

Persona :

Eli is a generous and respected fireman. He is recently divorced and very well off financially. He works in a new fire station that is technologically advanced so he knows his way around a computer or a tablet. He aspires to be Station Chief one day and have a team of his own. He likes playing tennis, and keeps himself conditioned. Eli's fire station has been extremely busy with the wildfires and covid-19. With all the extra work, Eli's station has had to cover multiple counties in california.

Use case #5 :

Eli recently heard about ASOPF and thinks the public can get informed faster and more efficiently by using this service. Having admin privileges, Eli is able to help identify areas of danger and input this data according to county. Eli can be on-scene at a wildfire, and be able to upload metrics of wildfires or infections via phone or tablet. Eli also has the ability to correspond with other directors of Health and Fire Departments so they can combine their data, and get the message out to the public. Eli can also edit the respective levels of evacuation in case there is a flash fire.

List of Main Data & Entries

Types of Users

- User
  - Holds information about the person who visited the website
  - Read-only access for site data
  - Data
    - User ID: integer
    - Email: string
    - Phone Number (SMS): number
    - Password: string
    - Home county: string
    - Subscribed lists: ???
- Admin User
  - Read/Write Access for Covid/Wildfire data
  - Data
    - User ID: integer
    - Email: string
    - Phone Number (SMS): integer
    - Password: string
    - Home county: string
    - Subscribed lists: ???
  - Admin ID: integer
    - Can access the management console to enter COVID/Wildfire data for specific counties

Data Items

- Persistent sidebar RSS feed
  - COVID cases & deaths per 100k
  - Wildfire cases
- Air quality forecasts
- Subscriber lists
  - Covid
    - State
    - County
    - City
    - Emergency notifications (high-alert)
  - Wildfire
    - State

- - - County
    - City
    - Emergency notifications (high-alert)
  - Counties
    - County Name
    - Population
    - Zip Codes within County
    - County Covid Stats
      - Cases
      - Deaths
    - County Wildfire Stats
      - Wildfire Status
      - Fire Containment Level
      - Evacuation Level
      - Evacuation Areas
  - State
    - State Name
    - Population
    - Total Covid Stats
    - Total Covid Stats

Functional Requirements

- COVID Stats (CA only)
  - (P1) Cases per 100k
  - (P1) Deaths per 100k
  - (P1) Cases & Deaths nationwide
  - (P2) Homeless impact
  - (P3) Stats on false positives & negatives of tests
- (P1) Search for county-specific
- (P1) Register to get alerts
- (P1) Wildfire stats
  - Num fires in county with respect to evacuation level
- (P3) Alerts app
- (P1) Administration Functions
- (P1)Authorization levels
  - (P1) Login System
    - County Health & Safety officer
    - Subscribers
- (P2) Registration Form
  - Required: Name, phone, email (for registration only), Password
  - Option: Zip Code, Phone provider (for SMS notifications)
- (P1) Back-end Analytics
- (P2) School closures/openings

- (P2) Reporting Requirements
- (P2) Current and historical Data
- (P1) Certification Requirements
- Send and request data to users, admin, public, country departments
- Able to receive content (ie, pictures, graphs, documents, cases, videos, blogs)
- System security
- Links to related systems/external databases

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 browser
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
5. deployment server.
6. No more than 1000 concurrent users shall be accessing the application at any time
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 e-mail 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)

Competitive Analysis

Feature	Fire.ca.gov[1] (Link)	LA Times[2] (Link)	Covid19.ca.gov[3] (Link)	ASOPF
Covid-19 Stats (Infected/Dead)	X	✓	✓	✓
Stats for Specific County	X	✓	✓	✓
Wildfire Stats	✓	X	X	✓
Live Alerts	X	X	X	✓
Analytics	X	✓	✓	✓
Input Metrics From Personal	X	X	X	✓

   Currently the market is saturated with many government and privately owned websites that specialize in the monitoring of the fires or Covid-19 cases in California, with many having implemented our planned features in terms of displaying and organizing our data. However, ASOPF is distinguishable by the website's focus on presenting data from both topics, active alerts to registered users, and ability to receive data from approved individuals about updates in their area. A two-in-one application for both

[1] https://www.fire.ca.gov/
[2] https://www.latimes.com/projects/california-coronavirus-cases-tracking-outbreak/
[3] https://update.covid19.ca.gov/

problems facing California will offer more convenience for the user than two separate sites to gather information. Also, our alerts will appeal to the users that want periodic updates ranging from Statistic updates, fire progression, and evacuation orders from their phone. The option to input additional data will be geared more to user's in the fire and health administration fields so as to allow a direct means of informing individuals, giving them more incentive to use our website.

High-Level Architecture
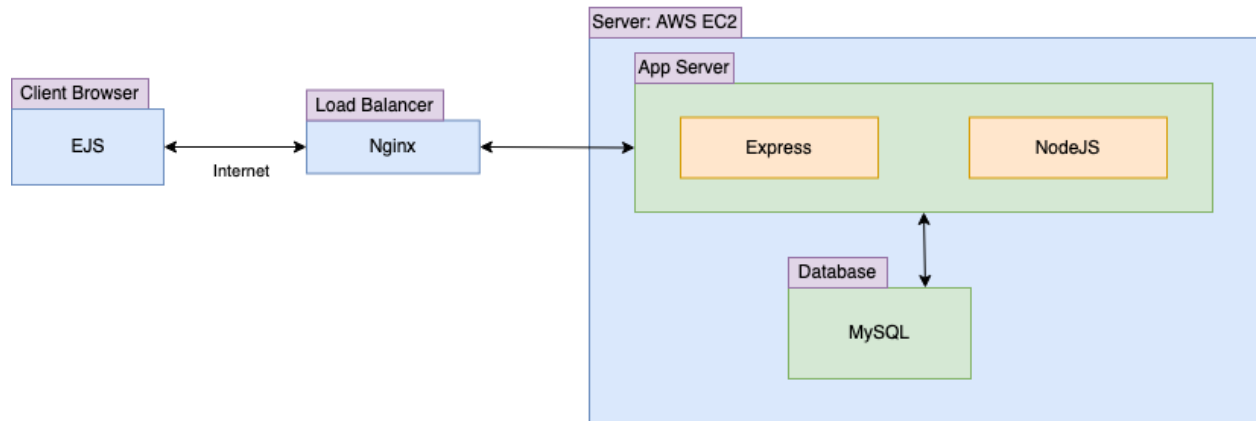
Tools and Systems

The system uses a customized stack that can be compared closest to a MEAN stack in structure. The main difference is the use of EJS as a templating engine instead of AngularJS and MySQL in place of MongoDB. The stack includes MySQL, ExpressJS, EJS, NodeJS. An additional component to this stack is the Nginx load balancer that sits in front of the NodeJS application servers.

- MySQL Database
  - A multi-threaded, multi-user, sequential Database Management System (DBMS).
- ExpressJS
  - Express is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications.
- EJS (Embedded Javascript)
  - EJS is a simple templating language that lets you generate HTML markup with plain JavaScript.
- NodeJS
  - An asynchronous event-driven JavaScript runtime, built on Chrome's V8 javascript engine.
- Nginx
  - An open source software for web serving, reverse proxying, caching, load balancing, media streaming, and etc.

Software Components

- Server Hardware
  - AWS Ec2
  - OS: Ubuntu LTS 18.04
  - Type: t.2 Micro 8gb
- Database
  - MySQL

- App Server
  - NodeJS
    - Frameworks
      - Express.js
    - NPM Dependencies
      - Express-session
      - Express-ejs-layouts
  - PM2
- Web Server
  - Nginx
- Templating Engine
  - Embedded Javascript (EJS)
- Frontend Frameworks
  - SCSS / CSS Framework (TBD)

Team and Roles

Name	Role
Ufkun Erdin	Team Lead & Document Master
Alexander De Charry	Back-End Lead & GitHub Master
Nicholas Handy	Back-End Lead & Database Master
Siddhi Rote	Front-End Lead
Erik Loza	Developer
Mohammad Pavi	Developer
Huan Nguyen	Developer

Checklist

ITEM	STATUS	COMMENTS
Team found time slot to meet outside of class	DONE	
GitHub master chosen	DONE	
Team decided and agreed together on using the listed SW tools and deployment server	DONE	
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	ON TRACK	
Team lead ensured that all team members read the final M1 and agree/understand it before submission	ON TRACK	
Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)	DONE	