SW Engineering CSC648/848 Spring 2023 Section 02

Application Title: Dooms Day Alert

Team 06

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Milestone 2

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History Table

Date Submitted	03/13/2023
Date Revised	

Functional Requirements - prioritized

The Dooms Day Alert website will be programmed by prioritizing its functions. In this part of the documentation, we present the priority levels and the associated functions. We have used numbers to indicate the level of priority, where 1 represents "must-haves," 2 represents desired functions, and 3 represents opportunistic ideas. We have also grouped the prioritizations for easy review.

Priority Grouping

Priority 1	**Priority 2**	**Priority 3**
1.1, **1.2**, **2.1**, **2.3**, **2.4**, **2.5**, **2.6**, **7.1**, **7.2**, **7.4**, **8.2**, **8.3**, **8.4**, **8.5**	**2.2**, **4.1**, **5.1**, **5.2**, **5.3**, **5.4**, **5.5**, **8.1**	**3.1**, **6.1**, **7.3**

Priority 1

Actor: User

1.1 Users have the option to create an account by entering their email, username and choosing a password. The account allows users to be able to get notifications or alerts for all the metrics such as covid cases, severe weather conditions, wildfires, and crimes.

1.2 Users are able to opt in as a government official, which allows users to grant access to add data to the metrics.

2.1 Users can search a specific city/zip code within the website's search features.

2.2 Users can search metrics in health/covid-cases within a county including number of covid cases.

2.3 Users can search metrics in weather within a city including temperature, air quality, and warnings.

2.4 Users can search metrics in wildfires within a county including warnings, and the areas that are affected.

2.5 Users can search metrics in security/crimes within a city including incident type and date/time.

7.1 Users can interact with maps to visualize the different counties within California.

7.2 Users can interact with the map and choose between Security and Wildfire to display on the map.

7.4 Users can search for the name of the fire.

7.5 Users can search for a specific incident type.

8.2 Users can access and view temperature, air quality, and warnings for weather.

8.3 Users can access and view incidents and law enforcement for security/crimes.

8.4 Users can access and view fire incidents, evacuation orders, or warnings for wildfires.

8.5 Users can access and view case counts, covid testing locations, and covid vaccination locations.

Actor: Admin

1.3 To opt in as a government official, it is required to provide documentation to prove their position. This is then reviewed by the website admin.

Priority 2

Actor: User

2.6 Users will stay in the preferred county when switching pages, if the users agree to allow the website to get users' location.

4.1 The website is able to adjust itself to different devices that users may use to access. Which allows the website to be more user-friendly no matter the devices that the users use to access the website.

5.1 Users can register for alerts or notifications for their county. The user will be able to choose between the weather, security, covid and wildfire of their county to have notifications on.

5.2 Users will receive an alert when there is a spike in covid-cases.

5.3 Users will receive an alert when there are severe weather conditions.

5.4 Users will receive an alert when there is a high risk of wildfires.

5.5 Users will receive an alert when there is an increase in crimes.

Priority 3

Actor: User

3.1 Users can choose specific information categories, such as health/covid-cases, weather, wildfires, and security/crimes. Within each category, users can toggle individual metrics on or off, depending on their preferences to provide a customization experience and interest for the users.

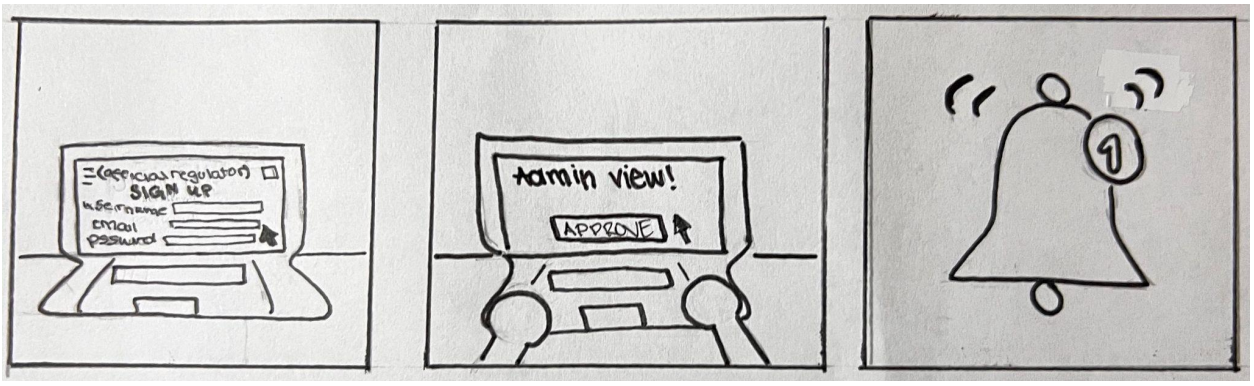
6.1 Users can view the trend of covid cases in different counties. The counties with the highest number of cases will be listed at the top, followed by the ones with lower numbers.

7.3 Users can filter the map with the search bar.

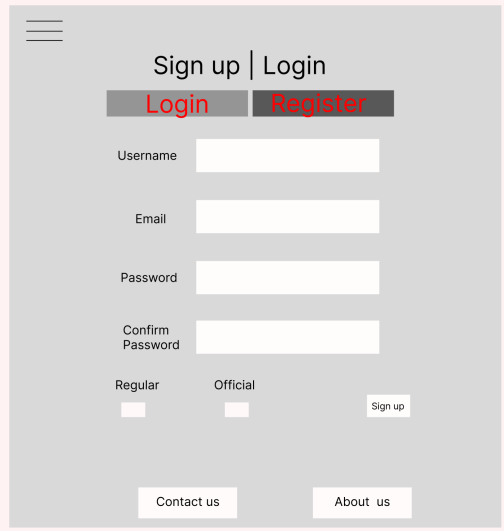
8.1 Users will have access to the government website and links for additional information with all the metrics.

UI Mockups and Storyboards (high level only)

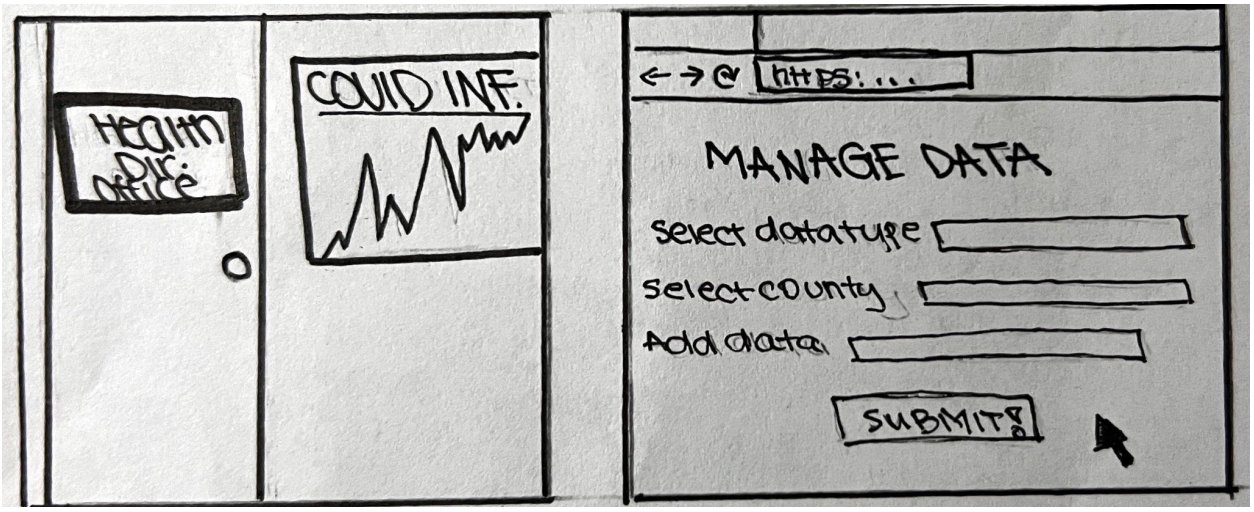
1. As we know Dooms Day Alert is open to the general public to search for information and find answers. If a customer decides to sign up for an account, they can declare themselves as a Regular or Official user. Official profile requests are reviewed and approved by the website administrator. Additionally, customers can sign up to receive real-time alerts based on their city preference.



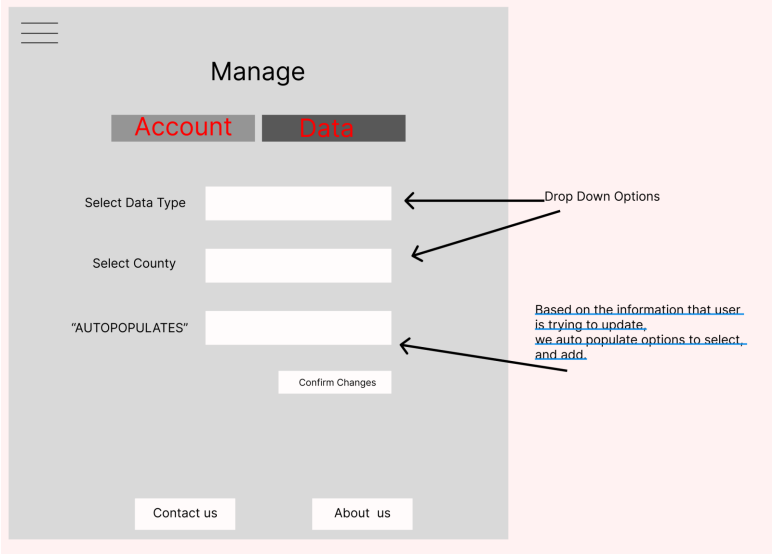
The Sign Up page interface enables users to create a username, email, and password. Additionally, users are prompted to declare themselves as either Regular or Official user. This information helps administrators determine which users have permission to add important data at a later time. See the image below:



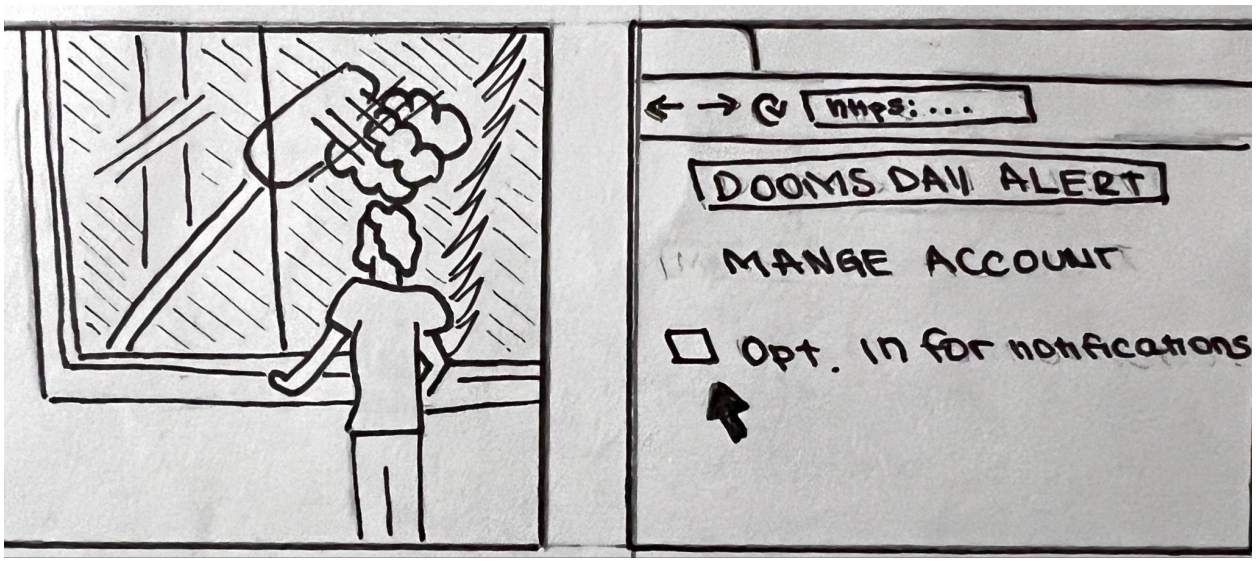
2. The Health Director of Contra Costa County has noticed a growing number of Covid infections and believes it is important to inform the public. As an official account holder, he accesses his bookmarks and launches the Dooms Day Alert. He decides to add the recent changes to the website and submits them for approval through the "Manage Data" section. The changes are then sent to the administrator for approval.



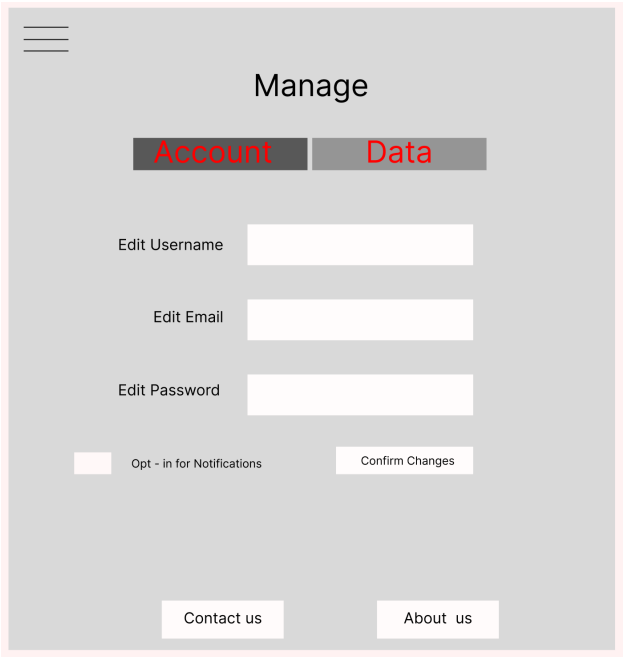
The Manage Data page is exclusively available for Official accounts and allows users to add information to the current data. This new data is then reviewed by the admin team before being added to the website. See the image below:



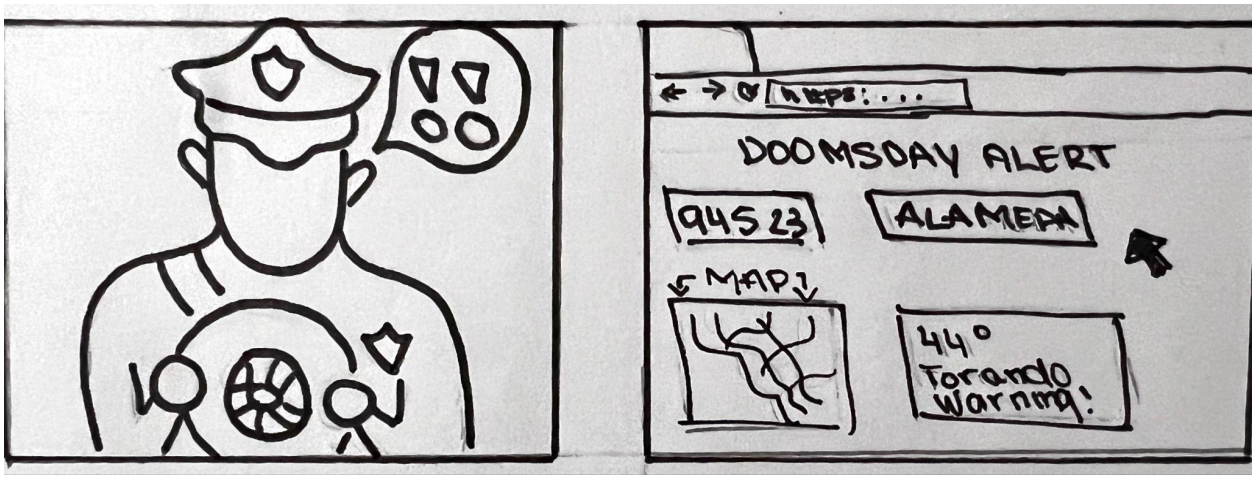
3. Governor Arnold is responsible for ensuring that his state is prepared for any potential crisis. He decides to opt-in to receive notifications of impending danger through the system, that way he can take prompt action immediately.



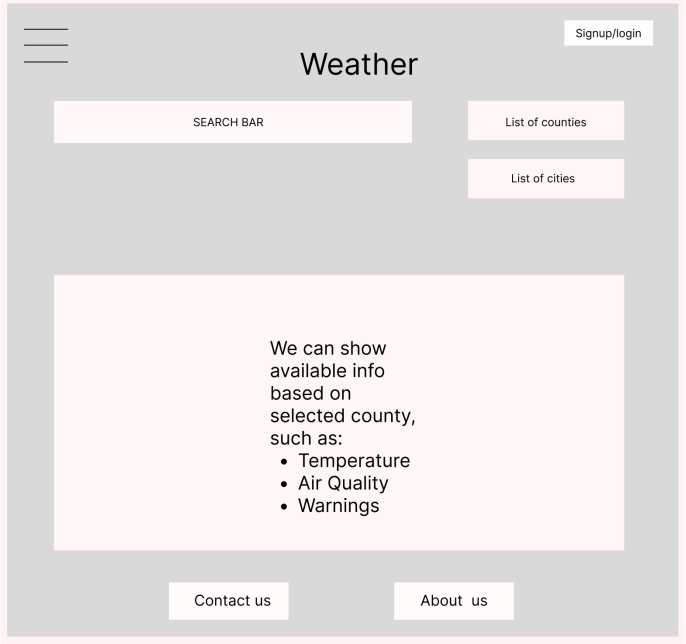
Users will be able to receive email notifications during warnings and emergencies. This feature will enable them to seek shelter promptly and stay safe. See the image below:



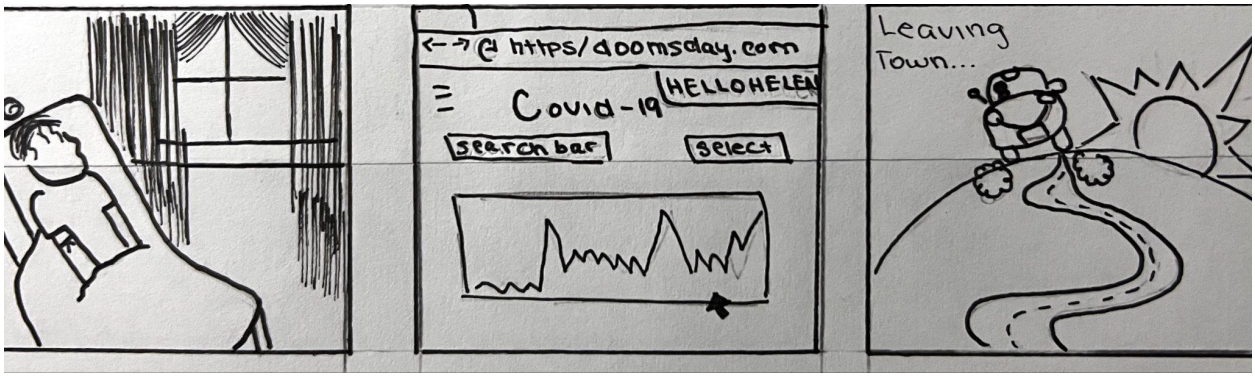
4. The Police Chief of a county is concerned about the weather conditions and wants to be informed if there are any tornado warnings. This will allow them to prepare a plan for the safety of drivers. To obtain this information, the Police Chief launches the Dooms Day Alert website and types in the city's zip code in the search bar. The website generates useful data for the Police Chief.



The weather page will allow users to search for a zip code or select a county to generate a list of cities. That way we will generate current information about the city's weather. See below:



5. Helen recently underwent an operation and wishes to explore California. However, due to her weakened immune system, she is considered to be at high risk for illness. Helen visits the Dooms Day Alert website, where she can access real-time information about Covid-19 in the county she plans to visit. This information allows her to make informed decisions regarding her health and associated risks.



The Covid-19 page will allow users to search for a zip code or find their city to generate the city's Covid status. That way we will generate charts to show the city's statistics. See below:

High level Architecture, Database Organization

Database organization

Info used and presented by the Dooms Day Alert application will be stored in tables in a database. The topics covered by the application include wildfires, Covid-19 cases, weather conditions, and security. Each of these topics will have its own table with its own items listed below the table title. Items in each table will have foreign keys for locations that link to the Locations table.

- Table 1: Locations
    - zip [int]
    - county [string]
    - city [string]
- Table 2: Covid
    - #id [int]
    - confirmedCases [int]
    - deaths [int]
    - recoveries [int]
    - covidVaccineLocation [foreign key: (name, address, openHours) references covidVaccineLocations]
    - covidTestLocations [foreign key: (name, address, openHours) references covidTestLocations]
- Table 3: covidVaccineLocations
    - name [string]

    - address [string]
    - openHours [String]
- Table 4: covidTestLocations
    - name [string]
    - address [string]
    - openHours [String]
- Table 5: Security
    - #id [int]
    - date [date]
    - time [time]
    - incidentType [string]
    - incidentDescription [string]
    - officerName [string]
    - badgeNumber [int]
    - incidentReportNumber [string]
    - address [string]
- Table 6: Weather
    - #id [int]
    - temperature [int]
    - AQI [int]
    - warnings [string]
- Table 7: Wildfire
    - #id [int]

    - name [string]
    - dateStart [date]
    - dateEnd [date]
    - warnings [string]
    - casualties [string]
- Table 8: Account
    - #id [int]
    - username [string]
    - email [string]
    - passwords [string]
    - account_type [string]

Media storage

We are going to use a database system. The main usage of this application is to provide its users with information relevant to what they are looking for. We are storing information on earthquakes, Covid-19, wildfires and security so we want media formats that are best suited to store these types of information. An example of an important piece of information would be location. A firefighter in San Francisco would not care about a fire in New York. Therefore, we would need a type of media storage to store GPS information. Tracking Covid-19 cases and trends, require our database to store information like dates, graphs, and excel sheets. These may be useful for health officials to be able to refer to. We will not be using any video / audio files.

Search/filter architecture and implementation

Search capability will be implemented on the page for each category. Users will able to search for specific incidents within selected category. For example, the Covid category will have tags such as number of deaths that the user can search for by location.

We will have a basic DB table for location that will have city names as foreign keys. Each category (Covid, Security, Weather, Wildfire) will have its own DB table, and the Covid-19 category will have sub-tables for covid test locations and covid vaccine locations. Once the user clicks on the category they want, for example wildfire, it will look through the wildfire table in the database and find the unique ID corresponding to the event, which will contain its city from the Location table. Then it will retrieve the information from the wildfire database and return it to the user.

APIs

The APIs we will use are the standard: Google Maps, earthquake data, COVID-19 Statistics, and Active Forest Fire APIs. We will not be using a self made API on this assignment. We will be using the Google Maps API for their map and location data. The Earthquake Data API will be where we retrieve earthquake data depending on where the user requests the information. The COVID-19 Statistics API will be used to retrieve covid related data that the user asks for. The Active Forest Fire API will be used to retrieve information regarding wildfires. The Crime Data API will be used to retrieve criminal activity data.

Describe any significant non-trivial algorithm or process

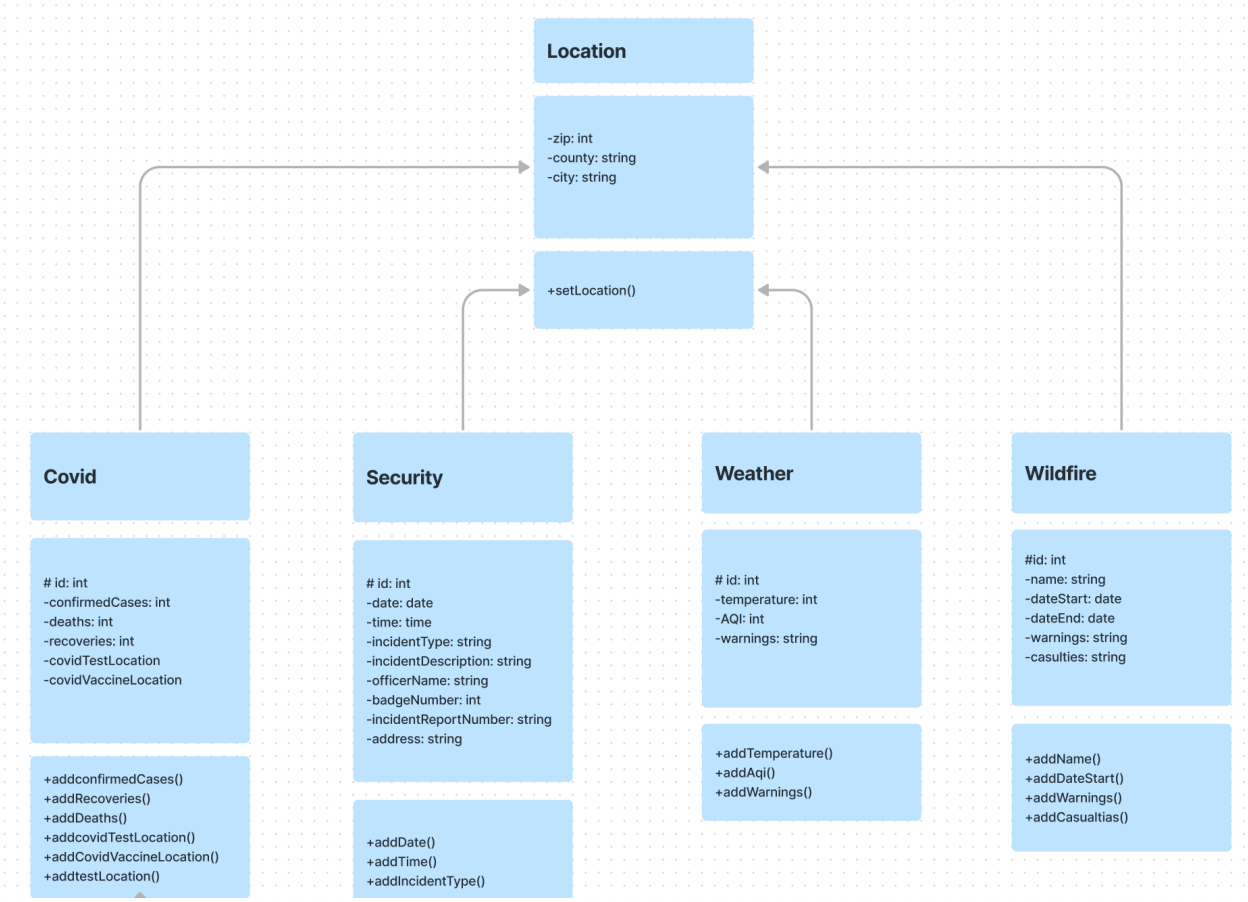
A non-trivial algorithm that we may introduce is having the most recent news or information available to the user and have it updated as more news comes out. We want to be

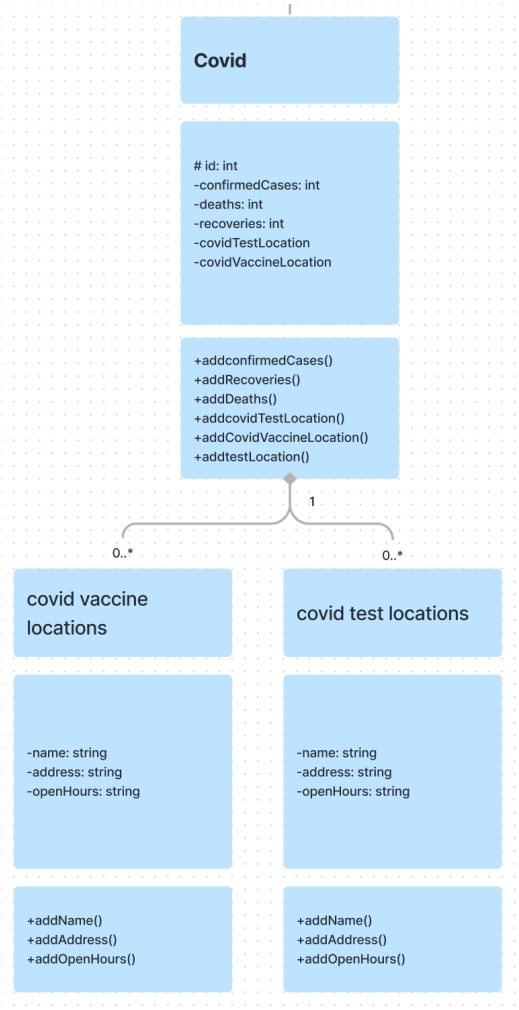
able to give the user the most up-to-date information regarding earthquakes, covid-19 cases, wildfires, and criminal information.

SW tools and framework

We have not added any new SW tools and / or framework. We are still using React for the Framework and IDE, Github, Terminal, and MySQL Workbench for the Tools.

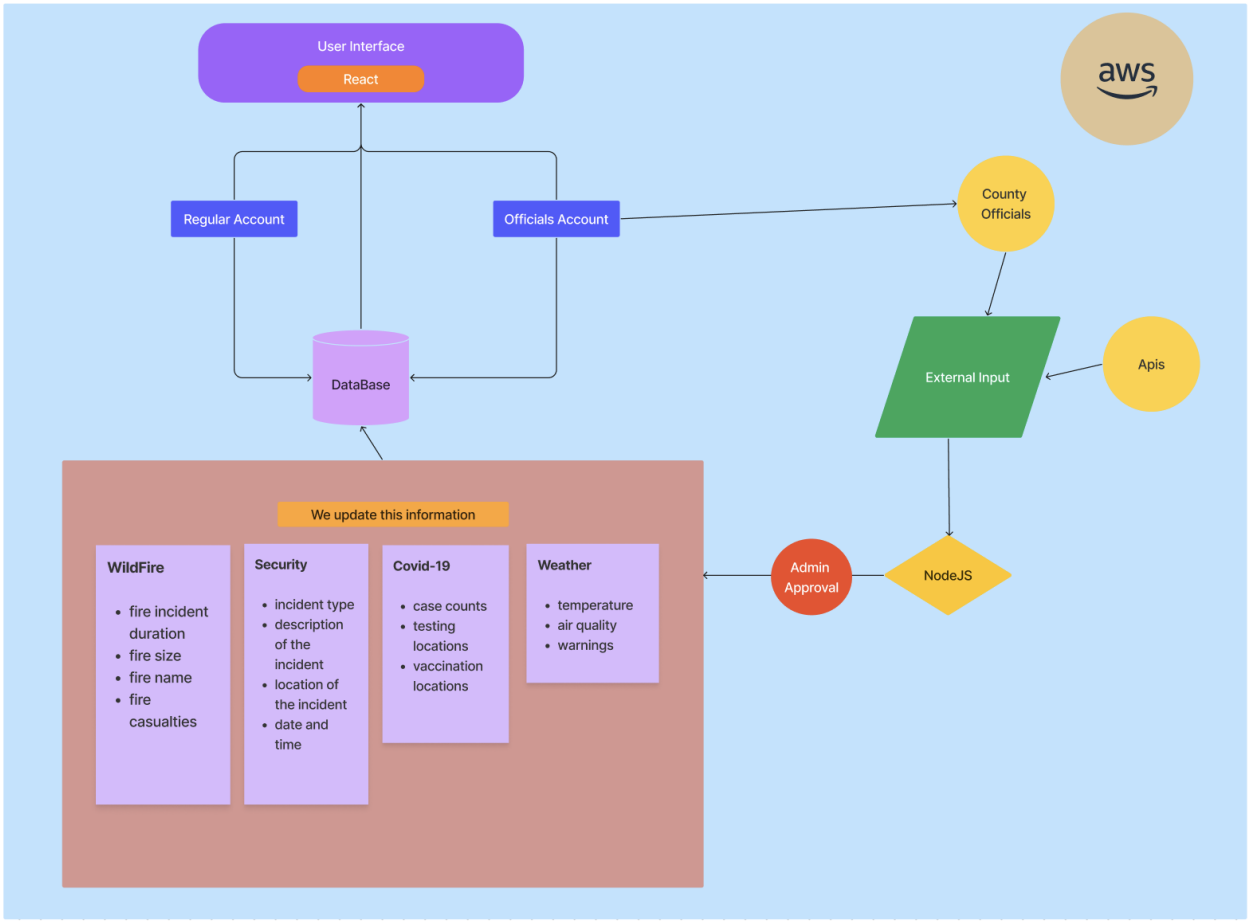
High Level UML Diagrams





The Location Table serves as the parent class for a range of child classes, including Covid, Security, Weather, and Wildfire, each of which contains pertinent information relative to its title. Within the Covid subclass, Covid Vaccine Locations and Covid Test Locations exist as subcategories with a composition relationship to the Covid class, signifying that they are entirely reliant on the Covid class for operation and data accuracy. While other child classes, such as Security, Weather, and Wildfire, may have differing relationships with their respective classes, they too are essential to organizing and providing precise information. By categorizing and structuring data into relationships, the Location Table and its subcategories furnish a valuable

resource for numerous industries and organizations, including emergency response planning, public health initiatives, and disaster management, among others.



This is a UML component and deployment diagram plan for our web application, which is deployed on Amazon Web Services (AWS). The application is designed to provide information on Covid-19, Weather, Security, and Wildfire events. It is also accessed by county officials and regular account holders. The application receives external input in the form of data from county officials and various APIs. The APIs are used to pull information on Covid-19, Weather,

Security, and Wildfire events from external sources. County officials can input information about Covid-19 cases, security updates, weather, and wildfire events. Once the external inputs are received, an admin checks and sorts the data to make it easier for users to access. The admin verifies the accuracy and relevance of the data, organizes it into categories, and assigns priority levels to each category. Officials and regular account holders can access the information through their user interface. The user interface displays the sorted data in a clear and user-friendly manner. It may have tabs or menus for different types of data, filters to search for specific data elements, and alerts or notifications for important updates.

Identify actual key risks for your project at this time

- Must determine whether the API we plan to use is legal, contain the correct information, and will work with our application.
    - Solution is to test each API with our web application and databases to ensure that each API provides the correct information for our databases.
- Search bar integration with the data that is being extracted using API. Information could be constantly changing, which could be false at the time user is accessing it.
    - We can extract the information from API every hour to provide up to date data.
- The planned product may be difficult due to our inexperience with APIs
    - Team members are constantly researching API's and their integrations.
- Time shortage is a critical risk factor for the project. It is difficult to find matching time for the team members to work with each other.
    - We break down the tasks in between smaller teams that can meet and solve those tasks.
- Team members are lacking skills on Database.
    - Team Lead will be assisting to Back-End team with database questions.
- Creating an interactive UI that is capable of adding data to the database from "Official" accounts will be challenging.
    - We are actively working on resolving these issues and hope to deliver a seamless user experience for our users.
- Despite having knowledge in various programming languages, each member lacks knowledge from the other's expertise.
    - We use Javascript because it balances out everyone's skill.

Project management

Effective project management involves ensuring that different team members work on various aspects of the project to produce a fast and efficient product. The responsibility of a Project Manager lies in proficiently dividing the work between the team members. In this particular project, we have allocated specific roles to each team member, including the Document Master who will oversee the outlining and design of the paper documentation, the Back End Lead who will manage the database and back-end information, and the Front End Lead who will be responsible for planning the design and interface of the website for future milestones.

Regular meetings are held between team members, both in and outside of class, to encourage collaboration and brainstorming. When milestones are assigned, the team collaborates to break them down into subsections, utilizing the project management tool - Trello to separate sub-tasks and assign them to individuals or groups. By setting deadlines well in advance of the actual deadline, there is enough time for the team to review progress and make any necessary adjustments before submission.

Effective communication is essential in ensuring project success. By providing regular updates and identifying potential roadblocks, the team can work together to ensure that the project is completed on time and to a high standard. That being said, this provides an opportunity for the team to produce a superior product that meets all project goals and objectives.