Attend to Prevent

Proposal for CS 411 Project Tack 1

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I.   Summary

We propose *Attend to Prevent*, a web application dedicated to visualizing, analyzing, and interacting with COVID-19 spreading data in US. This application provides real-time maps based on the AWS COVID-19 data lake, data uploaded by users, and further the COVID-19 infection database provided by the hospital (if accessible) to help users assess the infection risk according to their current circumstances or trip plan.

As an addition, our application may also help the government and researchers to further track, analyze and predict the spread trend of COVID-19.

II.   Description

First and foremost, a vivid demonstration of pandemic situation around the user will be offered. It helps users wisely plan their travels and locate the optimal place to go to during the arrival of covid-19 heap.

Nevertheless, *Attend to Prevent* enables user to upload their personal COVID-19 health status data in real-time, which can support the tracking and the updating of COVID-19 visual maps, effectively assisting global

community, health departments, and research organizations in better understanding the spread of the pandemic and taking appropriate preventative and management measures.

III.   Usefulness of Our Application

Attend to Prevent is designed with greatly life-interacting usefulness. For instance, when an international tourist is going to visit US or a US domestic resident is going to travel to another place, the caseload in destination in the past few months and the death rate in that area can help them to manage their travel plan and be careful of any possible risks.

When a person caught COVID-19, he could also search on the tracking map provided by our application to see where the nearest available medical resource is so that he can get treatment at the first moment.

Creative distinction of our application

There do be applications providing the similar services, orientating users with official statistics, especially those offered by the governments all over the world in response to requirements of controlling the risk for further pandemic spread. However, to the best of what we have witnessed, there has rarely been a platform that allows users to upload their own experiences and situations and thus derive open and transparent statistics for pandemic evaluation and even further, personal assistance in common cases such as trip planning and medical support. *Attend to Prevent* will

change this occasion, making full use of power of the community for the very first time in order to enable residents way smoother and more peacefully live through aftermath of the pandemic.

IV. Realness of Our Application

Attend to Prevent will totally be built on our chosen Covid-19 datasets which are continuously up to date and carefully managed. The major database that the functionalities application rely on would be AWS COVID-19 data lake, which is a centralized repository of up-to-date and curated datasets focused on the spread and characteristics of the novel coronavirus. This data lake contains pre-processed, curated, and publicly readable data, ready for analysis by anyone and many of which is sourced through AWS Data Exchange.

Hosted on the AWS cloud, this curated data lake contains useful data sets such as COVID-19 case tracking data from The New York Times, COVID-19 testing data from the COVID Tracking Project, hospital bed availability from Definitive Healthcare, health survey data from the Delphi Research Group, and research data from over 45,000 articles about COVID-19 and related coronaviruses from the Allen Institute for AI. As new versions of the datasets are published and other reliable sources become available, we will update the data lake.

The data comprises various catalogs, including tables of vaccine allocation by US State, US Coronavirus Cases, Coronavirus Disease

Testing Data and USA Hospital Beds and CORD 19 Open Research Dataset Challenge, COVID cast Epidemiological Data, Tableau Covid-19 Data Hub and COVID-19 Prediction Models Counties and Hospitals. It also contains a knowledge graph on how all these tables are interrelated, as well as other global data for reference. There is a lookup table to support visualization.

Therefore, the realness of data including death rate, caseload and medical resources are guaranteed. All of functions offered by our application would be infinitely close to reflecting the authentic and broadest Covid-19 situation in US.

V. Functionality

As the unique feature of *Attend to Prevent*, we attempt to provide user login interface to allow users create their own accounts and log in. By filling in personal information, they will be able to complete their profile, based on which we can return personalized output.

Another idea of ours is that, if users provide their residences that are detailed to city or state, we can accordingly output a visualization of the infection risks inside the particular state or in the surrounding cities. Besides infection rate, medical resources will also be taken into account. This would be achieved by querying the data on same location, like city affiliated to same state, or hospitals in the same city.

Meanwhile, the information offered to the interface will include

following forms: personal basic information (gender, age, and place of residence), symptom information (date of symptom onset and severity), testing information (COVID-19 test date and results), medical information (whether treatment has been received, the name and address of the treating hospital), contact history, travel history, and other health conditions (whether there are underlying health issues). Our form will also provide a feature-rich form design tool to meet individualized usage needs. Additionally, with the user's consent to our privacy policy, the system can automatically fill in time, address-related information (modifiable), and repetitive information, making the data upload process more convenient.

Furthermore, developments on a bunch of extended functionalities that boosts the interaction among the community are definitely possible. An online posts room or even blog sites that are separated into different themes around the COVID assistance would dig the power of community even deeper.

Lastly, it is absolutely worth mentioning that our application will strictly comply with applicable laws and regulations, including those pertaining to personal health data. We ensure that user data remains private, and encryption is applied to both data transmission and storage to prevent unauthorized access. Access to and processing of uploaded data is restricted to authorized individuals and institutions only, thereby

preventing data leaks and misuse.

VI. UI Mockup
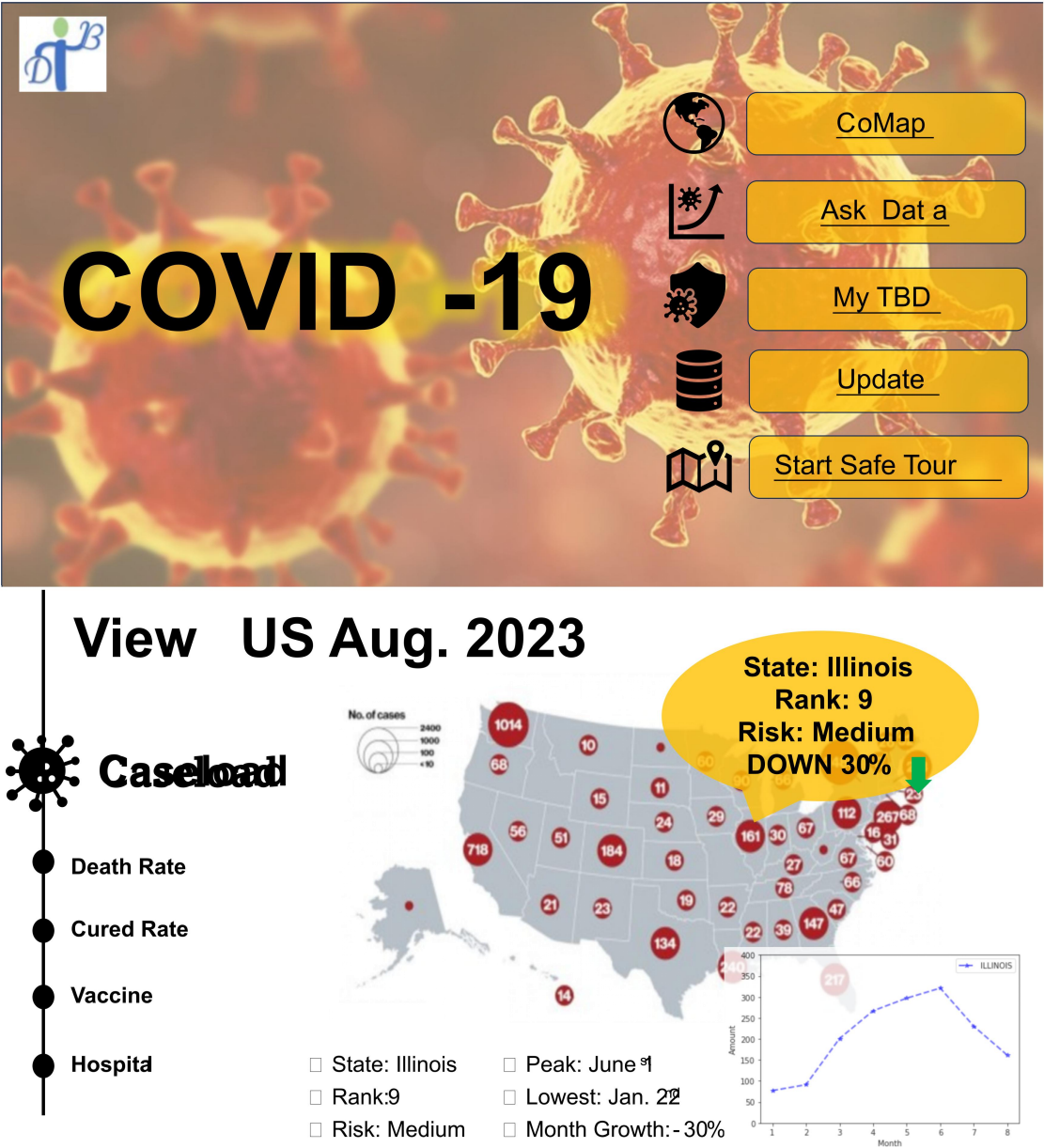
The cover of *Attend to Prevent* contains five main entries according to five different applications. User can click on them to access "View US Covid-Map 2023", "Get Firsthand Data", "Manage User's Own Database", "Update Users' Health Condition" and "Plan Risk-Free Tour"

separately. After clicking on any of them, another website will be displayed for further searching. For example, the website above is behind CoMap. Left side is a list of commands. If the first one is clicked on, Covid-19 caseload will be presented on US National Map. If user continues to click on State Illinois, it will display more details including its rank among all states, the trend of caseload in the past few months and so on.

VII.   Work Distribution

Since sticking to a particular sort of work will probably lead to a higher efficiency, we are for now supposing to make everyone stick to works that are particularly related. For both designing and impleting the database, Jiayu (jiayu9) will take care of how our application is going to make use of the select datasets, Haotian(hz75) will implement the detailed texts, core operation codes, and UI, while Qi (qilong2) and Bingjun (bingjun3) will be responsible to design and implement the interaction between users and our application, as well as determine how UI will be looked like. Our group member will demonstrate both works that they are responsible for and how their works are interacting with others, thus a systematic and detailed demo of our application will be offered.