

Utah COVID-19 Tracker

1. Utah needs tracing and tracking technology to identify how and where COVID-19 is spreading and deploy a "surgical" response to the threat, similar to South Korea.
2. This technology will include a mobile app that will allow Utahns to see hot spots for the virus, report symptoms, and receive messages and updates from the State while respecting user privacy.
3. This technology will also include a secure portal that allows Utah's public health officials to see "red and green zones" and better allocate testing and quarantines to defeat transmission zones, and allow lower-risk Utahns to be out of quarantine using social distancing best practices.
4. Local company Twenty Holdings, Inc. is one of the top location-based app builders in the world with millions of users throughout the U.S.
5. They have agreed to repurpose their technology to build v.1 for Utah within 2 weeks.

Utah COVID-19 Tracker

Collaboration with Twenty Holdings, Inc.

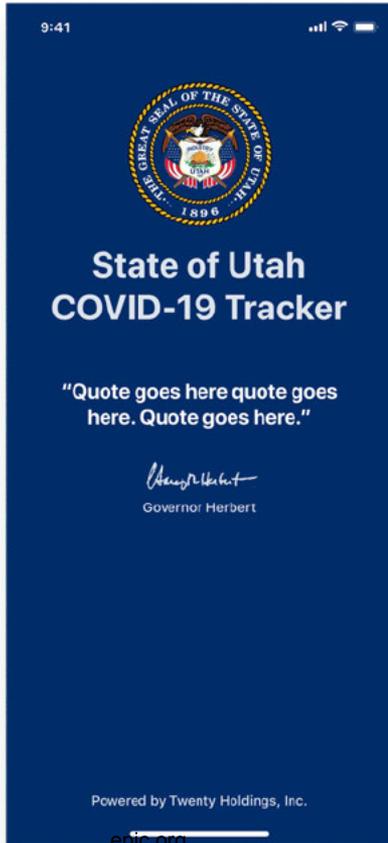
twenty

Problems to be Solved

1. Can we discover who's had contact with people who have tested positive for COVID-19?
2. Can we use technology to help state officials identify transmission zones and make decisions about where to deploy testing and containment resources?
3. Can we help Utah residents and businesses protect themselves and each other?

Mobile Applications

Registration



9:41



**State of Utah
COVID-19 Tracker**

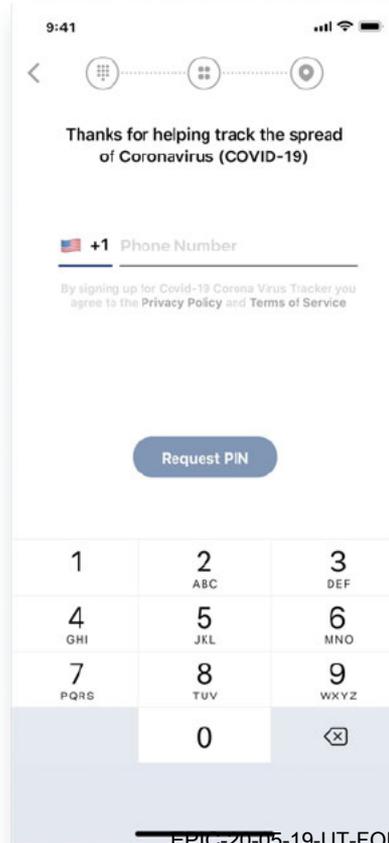
"Quote goes here quote goes here. Quote goes here."



Governor Herbert

Powered by Twenty Holdings, Inc.

epic.org



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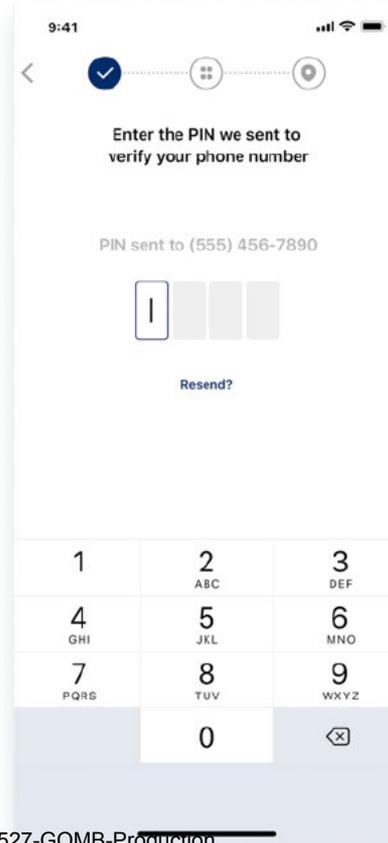
Thanks for helping track the spread of Coronavirus (COVID-19)

+1 Phone Number

By signing up for Covid-19 Corena Virus Tracker you agree to the [Privacy Policy](#) and [Terms of Service](#)

Request PIN

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
	0	<X>



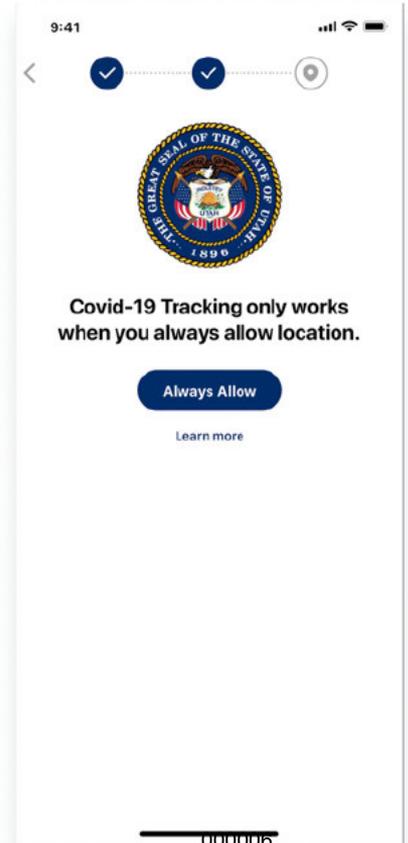
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Enter the PIN we sent to verify your phone number

PIN sent to (555) 456-7890

Resend?

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
	0	<X>



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Covid-19 Tracking only works when you always allow location.

Always Allow

[Learn more](#)

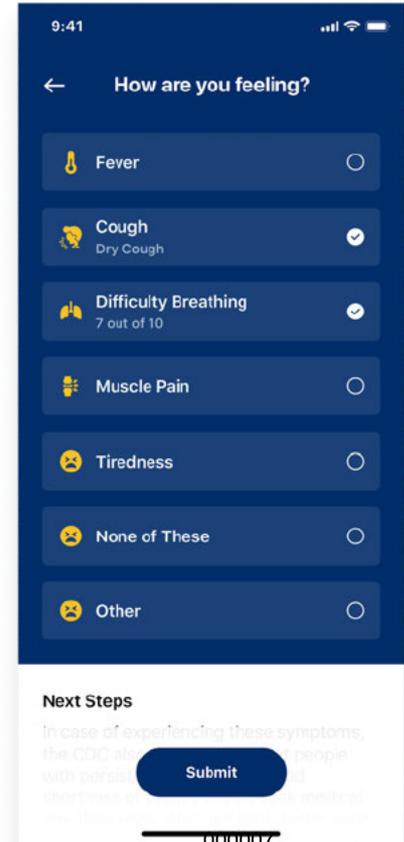
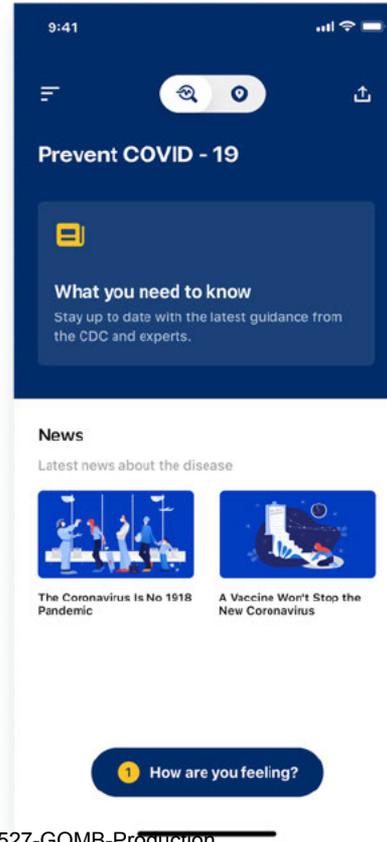
"How Are You Feeling?"

Ask users daily to report how they're feeling.

Users who aren't feeling well report specific symptoms.

High-risk people can be told to quarantine, seek testing, medical attention, etc.

Private response data will be used to highlight probable "hot-spots" in the Official Portal.

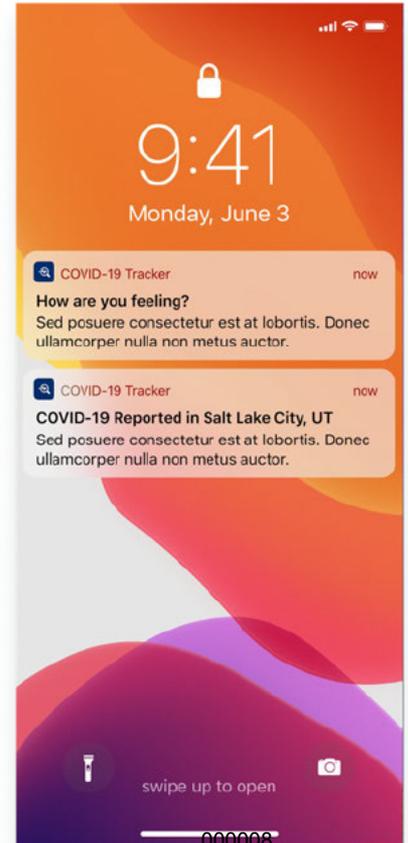
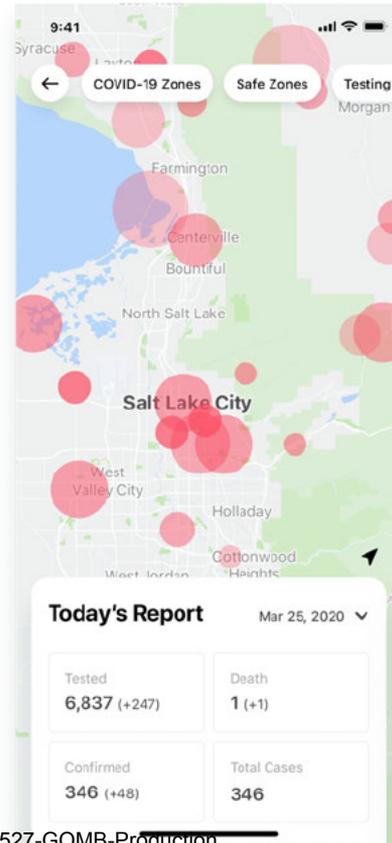


Tracker and Alerts

“Hot-spots” will be at a zoomed-out level for end-users to know generally where to take extra precautions while respecting user privacy.

Integrate and display latest case numbers reported by the State.

Alert users if we detect that they may have been exposed to COVID-19.

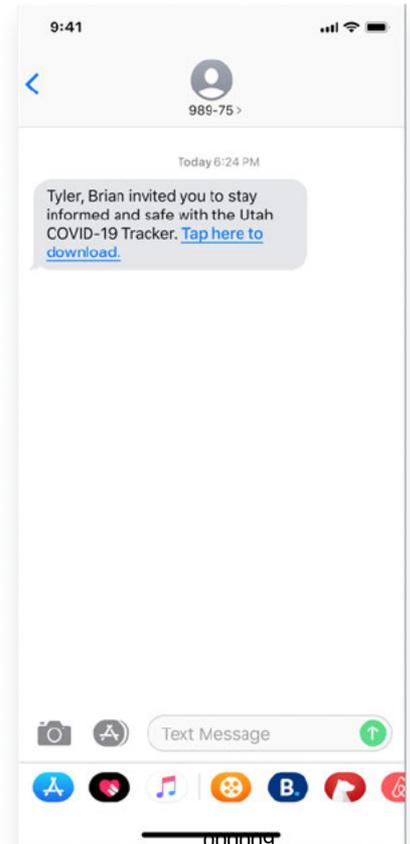
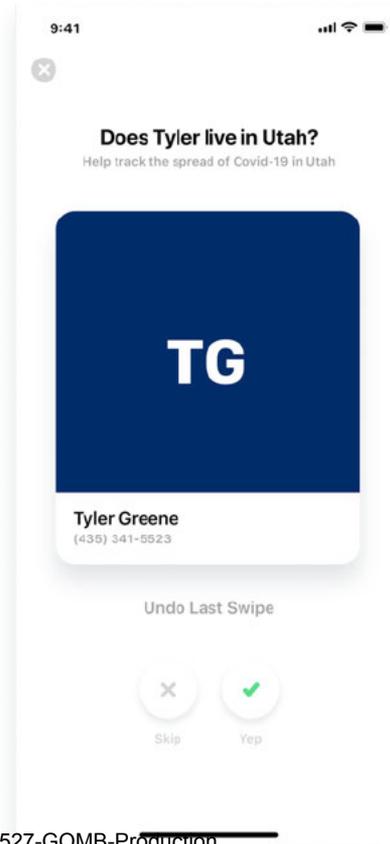


User-to-User Sharing

Allow the community to easily share the Utah COVID-19 Tracker.

Invites are targeted to people who live in Utah.

People inviting friends and family builds credibility, trust and organic growth.



Official Portal

Decision Dashboard

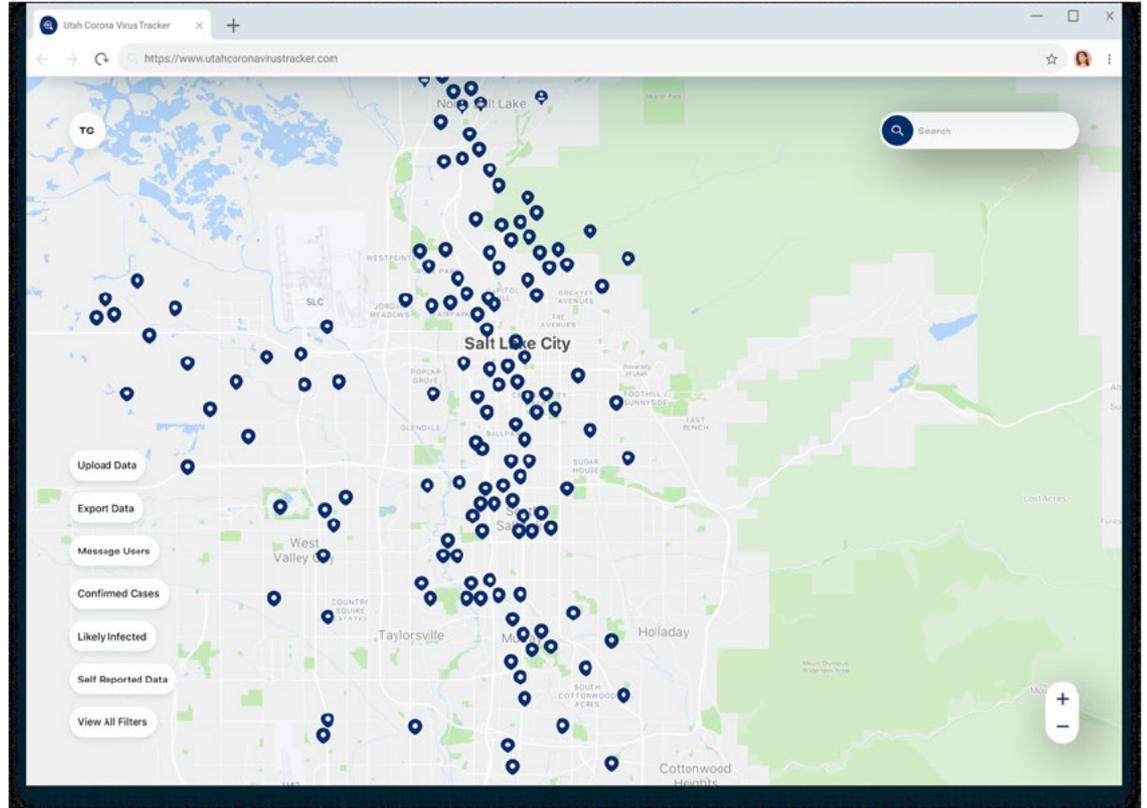
Secure login

Import test data

Export user location data

Export user symptom data

Securely display testing data
on the map over time



Tech Stack

Tech Stack (already scaled to millions of users)

Twenty existing technology:

- iOS and Android native application infrastructure
- Real-time mapping and location service with special Apple permissions
- Django/PHP API
- User management database
- MQTT/Erlang communication service

Third-party services (dynamic scaling/cost):

- Hosted on AWS
- SMS invites powered by Twilio/Nexmo integration
- Custom map powered by Mapbox

10-Days (16 engineers, designers, data scientists, product leaders)

- iOS and Android mobile applications with user registration, location data sharing, basic map visualization, user-to-user sharing, best practices info or links out on how to stay safe.
- Automated alerts for users when exposure detection occurs.
- Official Portal with the ability to authenticate official users, import official COVID-19 test data, export raw user location data, and the map-based visualization of location check-ins of infected users with "green zones" and "red zones."
- Basic back-end user analytics reporting and load testing.

30-Days

- Update to iOS and Android mobile applications to include Daily Symptom Reports to capture how users are feeling.
- Update Official Portal to include visual display of Daily Symptom Report data, indicating hot-spots on the map where COVID-19 infection is likely.
- Update Official Portal to allow officials to export raw Daily Symptom Report data.
- Client-side analytics and reports.

45-Days

- Update to iOS and Android mobile applications, and to the Official Portal to support State-to-User communication. The system will allow state officials to target updates, alerts, and messages to individuals and communities of users.
- Update iOS and Android mobile applications to display testing center locations on the map.

Cost Estimate

Initial (iOS, Android & Official Portal)

- License & Development Cost: \$2.75M

Ongoing Support (Length of term TBD)

- \$300k estimate for maintenance/month including hosting & external licenses (price is variable based on number of users and additional features, functionality and services)
- Additional features, functionality, and services priced and built as agreed

*Twenty will work with the State of Utah to ensure functionality complies with applicable law (and if required, the parties will agree on modifications to functionality as appropriate). This proposal is non-binding and subject to Twenty and the State of Utah entering into a definitive legal agreement.

Thank You

Healthy Together App – Requirement Document

Overview

To help citizens and public health officials tackle the challenges of dealing with COVID-19, there is a need to swiftly identify infected populations, the point of origin of the infection, who it may have spread to and establish standardized quarantine protocols to protect against further spread. Currently, the process of contact tracing and investigation is manual and labor intensive. It requires skilled investigators trying to jog the memory of people.

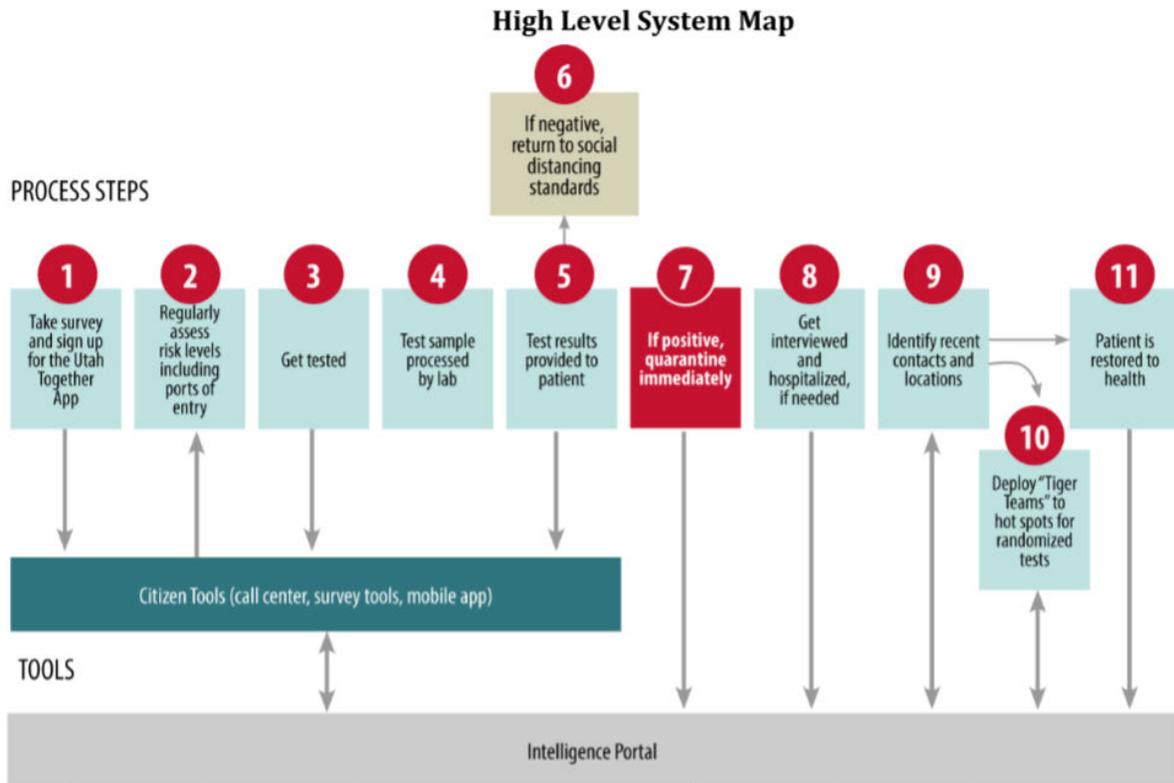
The State of Utah response to COVID-19 relies on scaling up testing, tracing, quarantine and treatment operations. This requires three critical questions to be answered that can be aided by mobile technology:

1. Who are all the people who have been in contact with an infected person?
2. Where all has an infected person been in the 48 hours before they tested positive?
3. Where are emerging hotspots based on symptom, infection, and location tracking data?

Answering the first question allows the investigators to contain the spread by isolating or quarantining the potentially infected contacts. The second question allows investigators to identify transmission networks. The first question can be answered by using Bluetooth and/or location tracking technology. The second question, which is equally, if not, more critical to opening the economy, requires location information of the users. The third question requires data aggregation and analytics. An end-to-end intelligence portal that leverages the latest mobile technology, location services, data visualization and analytics can help citizens and the state of Utah to work together for a return to normal work and household patterns.

A key tool in the toolset that will be deployed is a mobile app which provides value to the users and helps in creating large scale collaboration for the state and the citizens.

Value of the App to the COVID-19 response efforts



The App, once adopted widely, provides the following benefits to the COVID-19 response for the State of Utah:

- **Shorten Time from Symptoms to Isolation:** By using the daily check-in function of the App, users experiencing symptoms, or change in symptoms, can quickly get directions for testing and subsequently follow appropriate protocols such as isolation or medical care. The shortened lead time will reduce the risk and exposure of potentially spreading the virus the longer it goes undetected.
- **Simplify Contact Tracing:** By the answering questions 1 and 2 above in an automated fashion the App provides the investigator with powerful information to help conduct the interview. This should help exploit the capacity of the investigators (the constraining step) in the above process.
- **Simplify Follow-up:** Ensure tracers have a direct and convenient line of communication to those using the app – especially those at risk. The App can also help streamline the process for investigations and monitoring with messaging capability that can help setup appointments, get the user well prepared for an investigation interview and get basic monitoring information on an ongoing basis.
- **Identify Emerging Hotspots:** Combining symptom, test and location data can help identify emerging hotspots and focus limited state and local health resources.
- **Identify Superspreader Situations:** There are professions and situations (nursing care facilities and healthcare workers in these facilities) that have the potential to cause large scale transmission of the virus. It is extremely valuable to find these superspreaders and design safety protocols that help mitigate the risk. With the contact tracing and location history, the App will be able to identify these

situations for state and local health authorities. This capability will be critical to businesses and the local and state government to open up economic activity while providing reasonably safe working conditions for employees and customers. Once the economy resumes normalcy, the App will continue to provide the mechanism to monitor any emerging risks.

Value of the App to the citizen

In order for the App to be successful in achieving the objective of scaling up the testing, tracing and quarantine operations it will need wide-spread adoption. Users will have to find value in downloading the App and using it. In order to obtain higher levels of engagement the App will also support the following:

- **Self-Assessment:** Using the app, individuals can take daily personal health assessments, determine their level of risk, and obtain next steps for testing or isolating. Users are able to find their nearest testing center or healthcare provider. The App will have integration with the state data systems so that the users can be informed on their test results as they come in.
- **Hub for information:** The App will be a central platform for the health officials to communicate best practices, latest updates and guidance to citizens.
- **Contact Tracing:** Users on the App can also get notified if they come in contact with positive cases. This can help users modify their behavior and prevent further spread. The App can expedite contact tracing of positive COVID-19 cases by helping users get better prepared for their interview with the investigators.
- **Communication during quarantine:** People in quarantine are required to self-monitor and report symptoms to state and local health authorities. The App will allow this communication to happen with the convenience of text messaging.
- **Risk and Prevention information:** Real-time (aggregate) community-transmission data places the power of knowledge into the hands of people to make more informed decisions about their behavior and how to protect themselves and those they come in contact with to deter the spread of COVID-19.

Privacy Policy

Any technology that can track movement of individuals creates risks that the privacy of the users may be violated. To address the concern of information privacy, the State of Utah, along with its private technology partnerships, have made the following salient, firm commitments:

1. The information gathered with the App will be the property of the user and will not be used for any other purpose except in the management of the COVID-19 crisis. The information will not be shared with any commercial enterprises or government agencies that are not directly involved in the management of the COVID-19 pandemic.
2. Individuals “opting-in” to voluntarily participate will have the option to “opt-out” at any time.
3. When the crisis situation ends, all the collected data will be completely anonymized and only made available for research purposes.
4. We have made the commitment to our users that all location data will only be stored for 30 days. After 30 days all location data is deleted.
5. Users also have the right to delete all of their personal data (including all location data) at any time by just pressing a button.

We have reviewed the privacy policy with legal experts and they have endorsed the approach. In fact, we expect that this privacy policy will be a model that other states will emulate to help citizens become willing partners in the fight against the spread of the virus.

Requirements for the App

Digital Health Self-Assessment:

1. The App health assessment must be identical to the health assessments at other State of Utah sponsored efforts (like TestUtah.com) and must be in compliance with Department of Health guidelines for testing
2. The App must provide an easy way for the user to select the most convenient testing location
3. The App must be integrated with the healthcare providers workflow to get tested. In the case of TestUtah.com this should include an integration with the scheduling capability and the use of QR codes to get tested
4. The App must be able to display test results as they become available to the state
5. The App must have a mechanism to validate the PII before showing test result
6. The App must display instructions for people with positive or negative tests that are in accordance with Department of Health guidance
7. The App must provide the user with a history of their past assessments and their changing risk levels
8. The App must have a daily health assessment that only asks those questions that can change on a day-to-day basis. This assessment should follow UDOH guidelines

Hub for Notifications and Information:

1. The App notifications must be in accordance with UDOH guidelines
2. The App notifications should include indication of the urgency and importance so that they can drive the user to take the right actions
3. The App must indicate the color-coded threat level system of the state at the county level and the accompanying guidelines for citizens and businesses
4. The App must display the current key metrics - Hospital utilization, Case Counts, points of origin/clusters,etc.
5. The App must be able to send notifications to users based on the county/zip code they are in and the threat level at that location
6. The App must provide in context contact information and facilitate making these contacts through the App

Contact Tracing:

1. The App must have the capability to alert the user if they have come in "contact" with someone who is positive for COVID-19 or later turns positive for COVID-19

2. The App must provide a checklist to the user for the purpose of preparing to be interviewed by the health investigators
3. The App must allow better coordination for scheduling appointments with the investigators
4. The App must allow the user to decide if their location history and contact history can be shared directly with the investigators

Communication during quarantine:

1. The App developer must ensure that the App is not used directly in monitoring the users during quarantine
2. The App developer must provide an SMS based messaging that allows the state/local health authorities to communicate with the user for compliance during quarantine
3. The App developer must ensure that all messaging to the user in the quarantine period is in accordance with UDOH guidelines
4. The App must notify the user when quarantine protocols are complete

Risk and Prevention information:

1. The App must have capability to provide the users with aggregate risk level information based on data analytics that can help the users navigate with personal choices that prevent spread
2. The App must have visualizations or heat maps that inform users of changing patterns of spread by location

Requirements for the App Portal

Shorten Time from Symptoms to Isolation:

1. The App portal must provide metrics on a) User Engagement, b) Users taking Health Assessment, c) Time to get tested d) Users following up with the recommendations e) Users scheduling appointments with investigators

Simplify Contact Tracing:

1. The App should provide the user with a form/checklist to fill before the interview with the investigator and this form should be downloaded to the investigator in the App Portal
2. The App portal must allow investigators to message the user in order to schedule time for a phone interview
3. The App portal should have the capability for the investigator to enter information about a positive test, and with user permission, to get recent location history and recent contact history from the user
4. The App portal provides analytics-based risk assessment for every contact
5. The App portal must be able to initiate communication with contacts who may be at risk of infection
6. The App portal provides analytics-based risk assessment to determine likely point of origin

Simplify Follow-up:

1. The App developer must ensure that the App is not used directly in monitoring the users during quarantine
2. The App developer must provide an SMS based messaging that allows the state/local health authorities to communicate with the user for compliance during quarantine

Sprints of the App and the App Portal

Release 1 - Scheduled Release Date: April 22nd , 2020

- App
 1. Users can set "Privacy" protection and select opt-out/out based on user's preferences
 2. App provides assurance that data is only used for COVID-19 and will be depersonalized for research after
 3. Users are able to deactivate and/or delete account
 4. Health survey available to App users and ongoing daily assessments
 5. App displays testing location and selection available as well as directions, contact info, hotlines for scheduling, etc
 6. Users have the ability to invite others from their address book
 7. Notifications to users in the app
 8. Save checkup history in-app
 9. Users can share checkup history via PDF
 10. EpiTrax is integrated to receive test results and communicate the information with the user with the right messages (NOT TURNED ON YET)
 11. Notification tab displays Governor's Letter, FAQs, Get Informed
 12. Feedback channel in app
 13. SMS messaging to users when push notifications are turned off

- Developer's List/Others
 1. Dynamic content for survey and all app copy
 2. healthytogetherutah.com website available to the public
 3. CMS to manage all content, users, surveys, testing centers, notification management, etc
 4. App update management such as Maintenance mode, Forced update, Suggested update
 5. Bluetooth tracing enabled

Release 2 - Next Upgrade

- App
 1. Spanish language in App and notifications in Spanish
 2. Integrate scheduling / QR code with healthcare providers' (Intermountain, UoU, DOH)
 3. If user is tested "positive", allow user to choose consent to unlock data in portal and provide instructions for getting ready for the call with an investigator
 - Post-test instructions and guidance available for users to follow
 - Checklist to the user for the purpose of preparing to be interviewed
 - Allow user to decide if their location and contact history can be shared directly with the investigator
 4. Alert users of change in their risk status if they have had a moderate risk event
 5. Displays Red, Orange, Yellow, Green Risk levels in the app
 6. Accessibility including sound, enlarged screen, etc

- App Portal:
 1. Display data analytics on a) User Engagement, b) Users taking Health Assessment, c) Time to get tested d) Users following up with the recommendations e) Users scheduling appointments with investigators
 2. Build a list of "moderate risk" events for the person visible to public health
 3. Built a list of significant location check-ins for the person visible to public health
 4. Pareto of moderate risk events by location (1 main analysis, map view, root cause analysis)
 5. Test a set of pre-defined hypothesis (2 main analysis)

- Developer's List/Others
 1. New UI for businesses to open a business account and display business guidelines. Allow businesses to accept guidelines and share guidelines with their customers.
 2. Integrate Apple/Google API when available
 3. VoIP calling from investigator to user
 4. Qualtrics integration for survey and scheduling tests

In Queue

- App
 1. Users can select and provide consent about the quarantine protocols being followed
 - Assurance that App is not used directly in monitoring the users during quarantine
 - SMS based messaging that allows the state/local health authorities to communicate with the user for compliance during quarantine
 - Notification that quarantine period is complete
 2. Public facing heat map that inform users of changing patterns of spread by location
 3. Daily or real time notifications through the app that include:
 - Urgent and important state/UDOH messages with guidances or actions required
 - Color-coded threat levels and accompanying guidance for citizens and business
 - Specific threat level notifications at the local or zip code level for targeted individuals
 4. Display current key metrics - Hospital utilization, Case Counts, points of origin/clusters, etc.
 5. Display context contact information (such as 911, health authorities phone numbers) and facilitate making these contacts through the App

- App Portal
 1. Monitor quarantine protocols
 2. Integrate with survey / conversational API / Common login with the survey

 3. SMS or virtual scheduling function with the investigator for phone interview
 4. Upload/download function of checklist for the investigation

5. Capability to initiate communication with contacts who may be at risk
6. Virtually transfer scheduled appointments to testing centers, medical providers, and State
7. Monitor capacity and recommend closest testing at a location (information on insurance provider)
8. Visualization of the interactions and heat map of intensity at a granular level for the state
9. Reporting on Superspreader and communicate to targeted users through the App on changing behaviors/protocols