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Project Title: Technology Enablement for COVID-19 Pandemic Response

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THE STATE OF RHODE ISLAND IS A TRAILBLAZER

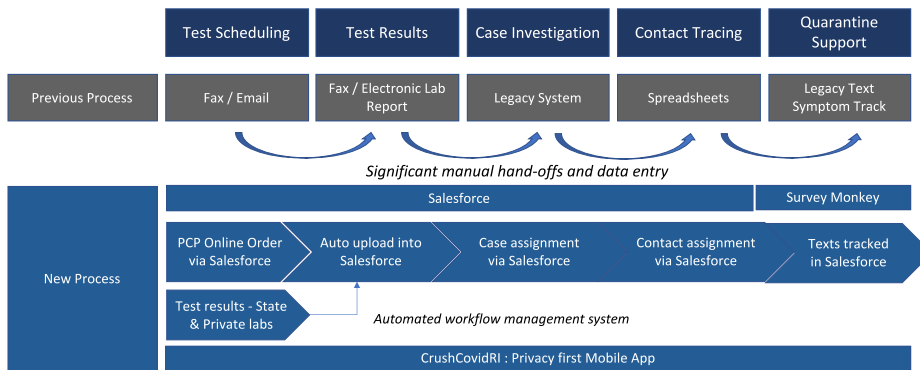
The State of Rhode Island is a Trailblazer in Testing and Contact Tracing Efforts

Executive Summary

In March 2020, faced with the emerging COVID-19 pandemic, Rhode Island acted quickly to innovate technology solutions to ensure a rapid and successful response to the pandemic. The Rhode Island Division of IT took the lead on the technology efforts needed to support the Rhode Island Department of Health (RIDOH) and Department of Labor & Training (DLT) in their public health and unemployment insurance response by setting up a **Technology Enablement Workstream (“TEW”)** redeploying a number of staff to support the development of innovative, cutting edge COVID-19 pandemic response systems with speed to execution.

RI Covid 19 Pandemic Response Platform

Technology – enabling speed to execution



TEW realized early on that while legacy systems existed across the State, they would not scale up at the rate that the situation demanded. Configuring and customizing them for daily changing needs from front line staff was impossible. Instead, of trying to search for legacy technology specialists, TEW decided to build innovative solutions at a rapid pace. These systems for RIDOH

enabled self-service test scheduling, physician portal, rapid test result communication, structured and comprehensive case investigation and contact tracing, automated symptom monitoring, and one-stop communication with the RI public.

For RI’s COVID-19 technology solutions contracts were successfully negotiated with purchase orders issued in as little as one week, and applications were deployed from concept to Go-Live in 2-4 weeks. Integrations that often take 6-12 months have been successfully completed in a few weeks. RI innovated an agile software development lifecycle to a superagile framework and user-centric design processes to deliver minimum viable products with a promise of continuous improvements and enhancements that have been delivered weekly.

Notably, many of the applications which make up the RIDOH COVID-19 Pandemic Response Platform (RCS), were developed and launched at no cost to the state. RI engaged in public-private partnerships with a clear vision to build innovative solutions that did not exist in the market for fighting a virus that was evolving daily. The RCS has been successful in supporting the RI state government response to the pandemic and has helped to prevent a second spike in infections after reopening began on May 18th. Key to this is ensuring continual engagement with the RI public. Technology has enabled a direct line of communication and engagement with residents through several key avenues: 1. *information delivery and empowerment through a mobile app*, 2. *quarantine and isolation monitoring through daily surveys*, and 3. *self-scheduling of COVID-19 tests for individuals with the highest exposure risk*. The technology solutions have enabled this engagement faster and for less effort than if it were attempted using human resources.

Project Narrative: Concept, Significance and Impact

CONCEPT

As March 2020 was rolling to a close, Rhode Island like many other states was facing an unprecedented disease, COVID-19. The novel coronavirus is highly contagious, and with each passing day and week tracking the virus' entry to RI became more difficult. The models quickly showed that the modest public health resources that conduct case investigations and contact tracing would be overwhelmed, and yet RI leadership knew that these public health activities were critical to slowing the spread. RI desperately needed technology to automate pieces of this process and ensure that there was consistency in the work effort and documentation as hundreds of helpers from the RI National Guard and additional staff were brought on board to assist the effort.

Governor Gina Raimondo pulled together a multi-agency team of staff to form different emergency workstreams including many from the Division of IT to form **Technology Enablement Workstream (TEW)**. This team ideated and implemented integrated technology solutions to address the new challenges faced.

A three-pronged approach was taken:

1. Envision & create a backend platform (Salesforce, Survey Monkey, Integrations) for RIDOH: RCS
2. Create a privacy first public facing mobile app (CRUSH COVID RI app)
3. Innovate a new Unemployment System for DLT

RI leadership knew that the best way to slow the spread of COVID-19 in RI was to ensure that individuals who test positive can be quickly engaged and supported through isolation, and that any contacts of that individual can be rapidly placed in quarantine. To do this required a massive increase in human resources, a transition to fully remote case investigation and contact tracing, and a technology stack that could support rapid response workflows. While traditionally the State procurement and technology implementation processes take time, the TEW team of a little less than 10 staff was committed to delivering solutions before the anticipated peak of COVID-19 cases, about a month away.

Contracts: Governor Raimondo wanted innovative solutions at fast pace and reached out to business leaders seeking partnership with those who were eager to help RI get started and wanted to learn from the State. This also enabled the private partners to co-create brand new products. TEW negotiated contracts with vendors like Salesforce.com, SurveyMonkey, and Infosys in as little as one week, and platforms were launched as minimal viable products in 2-4 weeks.

Cost: The backend platform was innovated and created on Salesforce and the minimum viable product was pro-bono (\$0). Similarly, the CRUSH COVID RI mobile app was also developed pro-bono (\$0) by Infosys in the spirit of innovation and partnership. Since then State has spent approximately \$1M for Salesforce maintenance, enhancement and support and \$200K for Mobile App (through July 2020).

Privacy & Security: Further, information privacy and security has been carefully addressed throughout the entire development of this integrated COVID-19 technology solution. Salesforce Health Cloud is used along with Shield. User access roles have been defined and implemented, data are encrypted in motion and at rest. The CRUSH COVID RI mobile app that is public facing and has GPS location tracking capabilities has undergone rigorous security/privacy assessments to ensure data are protected as expected. All of the privacy and security approached have been communicated openly with the RI public through the Governor's COVID-19 press conferences.

Upon completion of the assessment, it is our professional determination that the overall privacy and security posture of the CRUSH COVID RI application, and the supporting organization, are sound and that the singular finding below regarding documentation policy does not in any way compromise the privacy and security of the CRUSH COVID RI application, and aligns with the low-risk appetite of the organization.

Compass IT Compliance

Approach: A superagile approach has been adopted and matured. The core RCS platform underwent 2 major releases every week to meet continuous demand of changes from the evolving situation. User-centric design

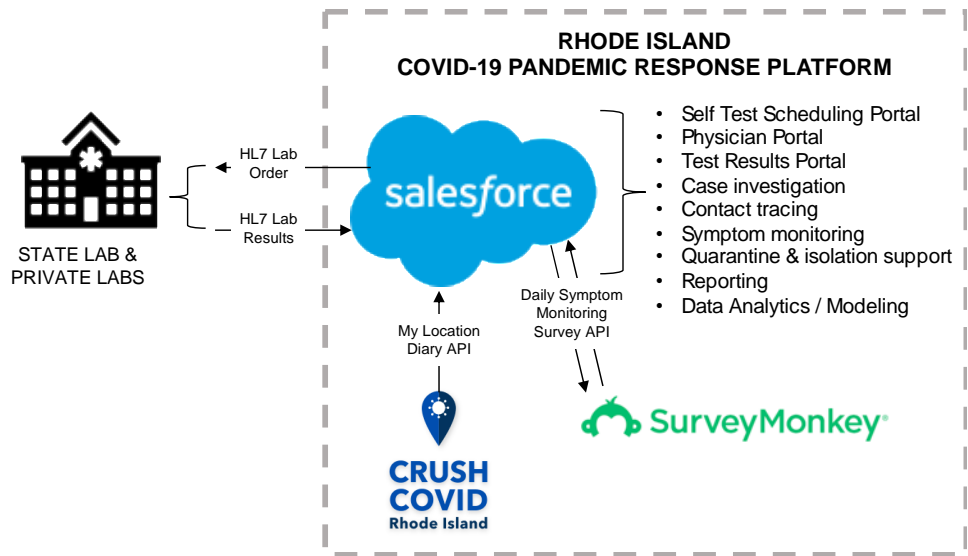
ensures enhancements and improvements come directly from the testing, case investigation, and contact tracing teams. As new enhancements are rolled out, users are trained by participating in user acceptance testing or webinars detailing the changes prior to deployment into production. To support the surge and ever-expanding staff at agencies, training sessions are conducted weekly.

Prong 1: RIDOH COVID-19 Pandemic Response Platform (RCS)

Traditionally the disease investigation and contact tracing workflow has been mostly manual with some data entry into a reportable disease system. This protocol was sufficient to respond to most infectious disease scenarios but was not established with the idea that hundreds or thousands of cases would be entered daily. To ensure that RI was prepared for a large outbreak, a new, innovative, end-to-end technology system was deployed using Salesforce.com’s Health Cloud product integrated with labs and other applications. This system manages nearly all of the data entry and automation to support case investigation and contact tracing. Along the way, the team identified that success would be measured by reaching 100% of positive tests and associated investigations documented in the platform.

The RCS supports functionality that starts with test scheduling, which can be initiated by a healthcare provider or by the individual resident through a web-based test-scheduling portal. Lab results for the largest participating labs get fed directly into the system,

where a positive lab test initiates a case investigation. A case investigator is assigned the case and calls the individual and documents all case information (symptoms, medical history, places the person has been, and any people they were in contact with). If the individual who tested positive had RI’s mobile app, CRUSH COVID RI, the individual can share a unique app ID from the app with the RIDOH so that the case investigator can click a button



to be able to view that entire location history. Lastly, the case investigator signs the individual up for automated symptom monitoring. Symptom monitoring has a complex logic based on a variety of data points and which considers cohabitation and daily symptom status. The daily symptom survey is triggered and tracked out of Salesforce but sent via text message through an integration with SurveyMonkey.

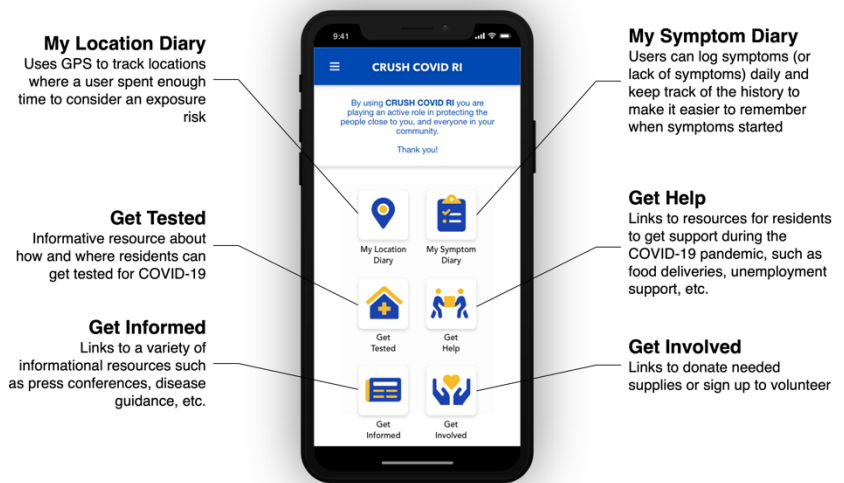
After the case investigation is complete, all of the direct contacts entered into the RCS are added to a work queue which is managed by the RI National Guard and civilian contact tracers. The contact tracers then take on the job of calling each contact, talking through the need to quarantine, screening for symptoms, and placing the individual on automated monitoring through SurveyMonkey. If any individual in isolation or quarantine needs additional support, such as food delivery, housing, other supplies, etc., those requests are passed from SurveyMonkey to Salesforce and then delivered to the United Way of RI to help connect the individual to the supports that are needed.

The data collected in the RCS, including symptoms and symptom onset, exposed places or contacts, race-ethnicity, insurance, etc., is provided for the reporting and modeling teams to keep up with the daily reporting of new cases and other statistics used to determine if reopening RI’s economy can proceed or needs to be dialed back.

Prong 2: CRUSH COVID RI Mobile App

One important priority for the Governor at the beginning of the pandemic was to create a “one-stop” place where residents could go to quickly and easily get information important for them. This was the idea that prompted the development of the CRUSH COVID RI mobile app for Android and iOS. The team wanted to develop a privacy-first app that could also empower residents to do their part and help during the pandemic, which led to the development of “My Location Diary” and “My Symptom Diary,” where residents can submit data to the RIDOH to help support the response. These tools essentially help Rhode Islanders jog their memory and assist tremendously during a positive case investigation.

RI was able to quickly identify the opportunity to partner with Infosys, which has a local design and innovation center located in RI, to develop the app. From the beginning the RI team recognized the importance of putting privacy first in this app, and unlike similar apps from other states and countries, the team decided this app should collect no personal information at all. The decision to share data from the app, such as a daily symptom survey or the location diary, is completely in the hands of the user. Anyone who feels uncomfortable submitting data can simply choose not to.



Prong 3: DLT Unemployment system

The COVID-19 public health emergency caused widespread economic shutdown. The resulting surge in unemployment and Unemployment Insurance (UI) benefits claims threatened to overwhelm the 40-year-old legacy systems State workforce Agencies rely on to collect, process, and pay claims.

Anticipating the constraints of the existing system, our organizations partnered to develop a strategy for offloading the collection of Pandemic Unemployment Assistance (PUA) claims and weekly certifications from the COBOL-based mainframe system to a new cloud solution, so qualified claimants would be paid quickly and accurately.

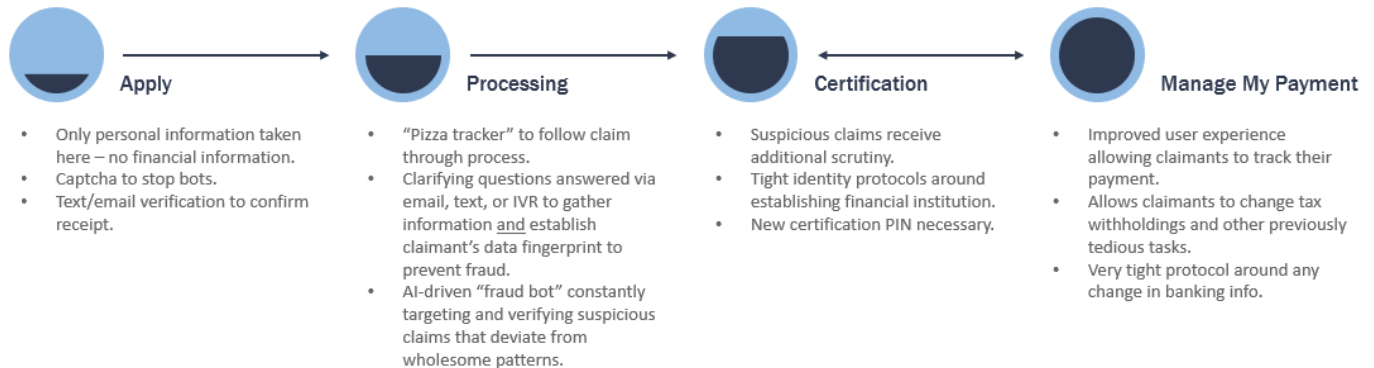
RI developed a scalable cloud solution to collect Pandemic Unemployment Assistance (PUA) claims robustly and securely. These claims are part of a new program created under the CARES Act that extended Unemployment Insurance benefits to independent contractors and gig-economy workers.

A state-of-the-art solution on AWS and Amazon Connect was implemented replacing a legacy UI IVR/IWR solution. A cloud-based contact center solution now exists with ability to expand call certification capacity. Our new system was developed, tested, and deployed within ten days following the passage of the CARES Act, making Rhode Island the first state in the country to collect, validate, and pay Pandemic Unemployment Assistance claims. A cloud-enhanced interactive voice response system was deployed a week later to handle the corresponding surge in weekly certifications for continuing unemployment benefits (March-April 2020). In addition to enabling timely payment of qualified benefits, the application achieved significant cost savings through its ability to verify adjusted gross income with the Division of Taxation and to allow claimants to correct invalid bank routing numbers without manual outreach or intervention.

Username
Password

Don't have an account? [Create one.](#)
 Forgot your username or password?

DLT | UI Online



As of June 11, 65,701 Pandemic Unemployment Assistance claims had been collected and 50,605 (or 77%) of these were successfully matched to adjusted gross income in 2018 or 2019. The alternative to automated verification was to collect and manually review paper or electronic documentation of adjusted gross income from claimants.

SIGNIFICANCE

RIDOH COVID-19 Pandemic Response Platform (RCS)

The importance of the RCS technology solution cannot be overstated – RI’s public health workforce would have struggled at responding to the need for testing, case investigation and contact tracing without the technology to support them. In turn, the RI public could have been much more severely impacted by the spread of COVID-19.

This unprecedented and community-supported technology effort has made it possible for RI to stay on top of the pandemic and implement aggressive isolation and quarantine protocols to help reduce the spread in RI. The privacy-centric approach has built trust with the residents of RI so that they feel comfortable participating in the testing and contact tracing process.

The vision and realization were so successful that Salesforce launched their work.com product in May and attributed the same to Rhode Island. This is innovative thinking at its best where Government IT was able to pave the way for a large product company.

This project has met all of the NASCIO 2020 State CIO TOP 10 Priorities, and not because it was used as a reference. The RI Division of IT has established a structure to enable RI to be successful at achieving all 10 priorities in any efforts through process, workforce development, and the pursuit of excellence.

CRUSH COVID RI Mobile App

The CRUSH COVID RI app was one of the first COVID-19 apps released by a US State when it was launched, and the most privacy-minded of all. It integrated the communications, symptom reporting, and GPS features unlike any other app, living up to the vision of a “one-stop” place for RI COVID-19 information and action. The app has been developed, launched, and improved for less than \$300,000, a small fraction of the cost of similar apps from around the country and the world.

DLT Unemployment system

We designed a scalable cloud architecture to meet five key needs for successfully tackling the Pandemic Unemployment Assistance claims surge and providing accurate and timely relief to thousands of people in crisis.

These needs were to: (1) securely collect claims over the Internet, (2) securely store and process the submitted claims, (3) clean and correct claims for input to the legacy system, (4) verify claims in a timely and cost-effective manner, and (5) handle the corresponding surge in weekly certifications for continuing claims.

Cloud solutions can augment legacy systems by offloading processes that are more efficiently handled in modern scalable systems, reserving the limited resources of legacy systems for what they were originally designed for. This agile use of combined technologies allowed Rhode Island to deliver timely Pandemic Unemployment Assistance benefits.

IMPACT

RIDOH COVID-19 Pandemic Response Platform (RCS) and CRUSH COVID RI Mobile App

Technology has truly enabled the State of RI to respond rapidly and effectively to the pandemic. Despite being the smallest state, RI:

- has consistently been in the top 10 states for the most testing per one million population,
- has not yet seen a second uptick in positive tests¹.
- has now been able reach 87% of positive patients (case investigation) in 24 hours post receiving results
- has 73+% contact tracking completed within 24 hours
- can automatically receive 96% of test results in system (this previously took 24+ hours from receipt and required manual data entry)
- has 65,000+ mobile app downloads in first 2 months of app launch (RI total population ~1M)
- has sent 20,000+ symptom monitoring surveys for quarantine and isolation patients in a month (May 2020)
- has 22.8% of Rhode Islanders tested vs. 10.2% US average
- has met all KPIs for Phase 3 reopening (June 2020):
 - Hospital Capacity: Less than 20% of beds filled
 - New Hospitalizations: Consistently fewer than 15 new hospitalizations & declining
 - R value: ~0.6

Mobile App: <https://health.ri.gov/covid/crush/>

Self-Test Scheduling Portal: <https://portal.ri.gov>

Physician Scheduling Portal: <https://schedulecovidtest.ri.gov>

Self-Symptom Checker: <https://covidselfcheck.ri.gov>

Salesforce/Marc Benioff crediting RI innovative vision: <https://www.cnbc.com/2020/05/04/salesforce-benioff-says-rhode-island-governor-inspired-contact-tracing-tools.html>

Rhode Island testing success: <https://www.bostonglobe.com/2020/06/22/metro/rhode-island-reports-five-deaths-25-new-cases-coronavirus/>

Successful Reopening plan & declining cases: <https://www.cnn.com/2020/06/28/health/us-coronavirus-sunday/index.html>

Salesforce customer success: <https://www.salesforce.com/customer-success-stories/state-of-rhode-island/>

DLT Unemployment system

The system collected 10,950 Pandemic Unemployment Assistance claims within 12 hours of the launch on April 7, with no reported errors. The certification solutions, both web and telephone, were deployed the evening of April 18. Sunday, April 19th, the two channels accepted 74,830 certifications.

Legacy system had ability to handle 75 concurrent calls whereas new Amazon Connect based system can handle 2000 concurrent calls.

<https://pbn.com/over-10k-file-for-pua-benefits-in-r-i-on-first-day-ui-claims-pass-100k/>

<https://www.governing.com/work/Cloud-Helps-Rhode-Island-Manage-an-Unprecedented-Surge-in-UI-Claims.html><https://www.nytimes.com/2020/04/30/upshot/unemployment-state-restrictions-pandemic.html>

¹ <https://coronavirus.jhu.edu/testing/individual-states/rhode-island>