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Digital Government During Crisis

Nova Scotia's Self Check-in Application

ANANDU NAIR · JONATHAN CRAFT

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Executive summary

The global COVID-19 pandemic served as a real test for digital government. It put on display how digital approaches could be put to use to help policymakers address unprecedented challenges, but also revealed some important limitations. This case study examines how the Government of Nova Scotia developed and implemented a COVID-19 related Safe Check-in travel application as part of its broader test, trace, and track strategy. Interviews with a cross section of staff involved with the app's creation and use reveal the strategic and operational choices that were required under extreme crisis conditions. It details the importance of having basic in-house digital capabilities along with foundational product and design components that can be quickly and effectively repurposed. Following the initial deployment of traditional phone and paper based responses for travel check-in, digital ways of working saw a quick initial Safe Check-in app built and iterated successively to meet rapidly evolving contexts. The typical digital government playbook has been well explored in other cases in this series and elsewhere. Interviews for this case revealed how well known digital approaches and practices were adapted given extreme time and resource constraints, and the fluidity of policy direction. Safe Check-in also demonstrates the challenges around securing effective coordination during a crisis. At a broad level it underscores the need to secure coordination between traditional public administration and digital ways of working and the importance of quickly establishing effective interdepartmental and interorganizational coordination. COVID-19 has provided a range of lessons learned for governments and citizens alike. This case concludes by highlighting how the effective strategy coupled with a strong human and digital government capacity lead delivered a quick and sustainable success in Nova Scotia during COVID-19. ■

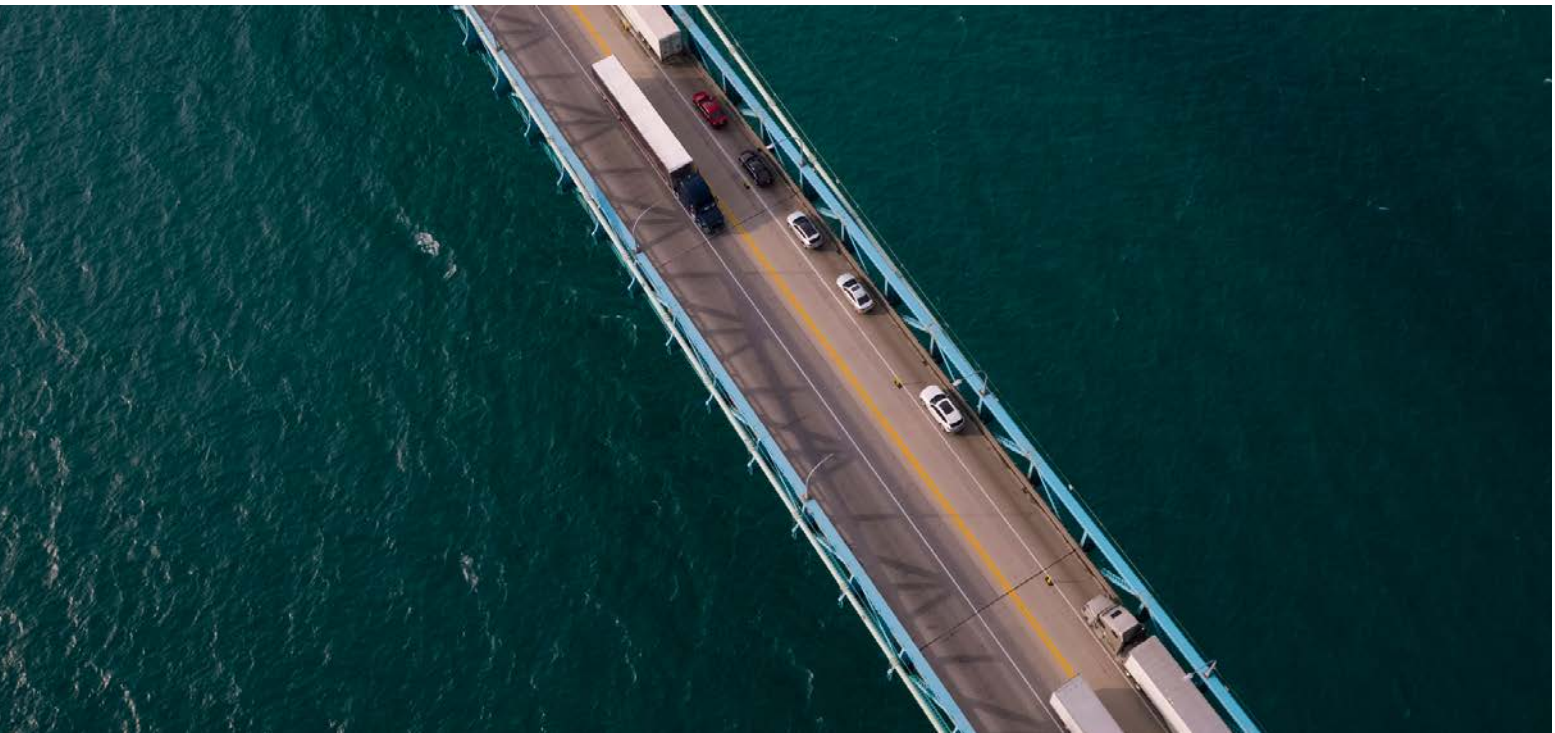

Image: Reese Lassman

Introduction

The COVID-19 global pandemic was a major challenge and potential catalyst for digital government transformation. It forced governments to move quicker than ever to stand up digital products and services, shore up data capacity, and deliver a range of programs and services to citizens, often through primarily digital channels. Some governments with well established digital government units and strategies were able to leverage existing infrastructure, personnel, and digital know-how; while others were forced to scramble or failed dramatically under immense policy and political pressure and limited delivery capacity (Stewart 2020; Jansen et al 2020; Clarke 2021; Roy 2021). All governments struggled in some way or another with their interventions, digital or otherwise, given the extraordinary need to respond to a multi-faceted global crisis (Boin et al 2020; United Nations 2022; OECD 2022). Government COVID responses provide an excellent case study for digital government with jurisdictions turning to digital channels for vaccination booking and administration websites and apps, integrating data on infection and transmission rates, and various health, social, and economic policies and benefits put in place for individuals and firms that often required adjustments as the pandemic evolved (Roseth et al 2021; Freegard et al 2020).

This case study explores the Canadian province of Nova Scotia's Safe Check-In application which was developed early in the pandemic as part of a suite of programs and services designed to support public health measures to control the transmission of COVID-19. The Nova Scotia Digital Service (NSDS) and cognate units within government were able to create a new digital tool in relatively short order, and coordinated across health, economic, justice, and educational sectors to ensure that the application was effectively supporting the policy aims of safe travel arrival and virus transmission management. They did so in the face of unprecedented challenges that saw a subnational provincial government effectively create a border security and management system where one had never existed. The team worked rapidly to iterate and adapt Safe Check-in in lock step with evolving public health contexts and policy directives, and as more information and experience was gained with COVID-19. Document analysis and interviews with 7 key public servants from various units directly involved with the project revealed that despite huge challenges, and some very real constraints, the Safe Check-in app was an extraordinary accomplishment. It was highly effective and worked largely as intended after its initial launch. It was strengthened and expanded over time through successive iterations and established itself not only as an exemplar, but also as a tool that could be expanded and repurposed to provide additional functionality for the broader government COVID-19 response.

> ...the Safe Check-in app was an extraordinary accomplishment.

The defining characteristics of the NSDS team's approach to product development and management shined through in meeting the safe-check policy challenges. Demonstrating that while there is consensus on the foundations of digital government: human centered design, iterative and agile ways of working, user testing , and platform based and data enabled systems, these fundamentals had to be adapted in practice particularly given the unique circumstances

of the COVID-19 global health pandemic. Research revealed that the digital government playbook that is often used had to be modified for Safe Check-in. With norms and practices bent to meet the time, resource, and public policy challenges associated with the pandemic. As we detail below, this was most vividly manifested with virtually no user testing undertaken in the development and iteration of the initial application. This stands in stark contrast to the NSDS and typical digital government practices (Greenway et al 2018; Mergel 2019; Mergetl et al 2019). Interviews also revealed the importance of existing investments in basic digital government capacity and key organizational choices involving where and how digital was organized within Nova Scotia. These were vital to the ability of the quick and effective response with the NSDS with staff able to turn to in house design patterns, platforms, products, and leverage tools made available by the Government of Canada. It was clear too how the work was undertaken across a number of teams in various units and departments that did not have a deep history of collaboration. This required unique and resource intensive efforts to coordinate work, to allow for quick developments and releases of the initial app but also to meet the tightening and loosening of public health restrictions and the various types of travelers and user needs. We sketch out these and other key findings below to help more clearly understand how a relatively new digital government unit sought to balance user and government needs through quick iterations in a crisis context. ■

Image: Getty Images/Unsplash

Image: Laura Bilger

Background: Nova Scotia and Digital Government

Nova Scotia is one of thirteen Canadian provinces and territories with a population of just over one million residents as of 2021. It is densely populated and Canada's second smallest province geographically with an area of 55,284 square kilometers including its mainland peninsula and islands. The NSDS itself is relatively new and was formally established in 2019. Like many other government digital service units, it was created after a succession of reforms and reorganizations seeking to better leverage Information Technology and Information Management (IT/IM) resources and practices within government. In the case of Nova Scotia, this includes the Shared Services project (2014-2019) that sought to centralize IT delivery from across the broad public sector into the Information Communication and Technology Services branch of the Department of Internal Services. In May 2019, the Office of Service Nova Scotia and Department of Internal Services departments merged and the first Chief Digital Officer and Associate Deputy Minister was appointed. The establishment of the NSDS and the appointment of a Chief Digital Officer (CDO) were signals that the government had shifted from the traditional 'IT' approach to adopt a digital government approach that had responsibilities for:

- Delivering excellent services, built around the needs of users.
- Providing public servants with the digital services and tools they need to enable collaboration, add value and be effective.
- Supporting and enabling the Nova Scotia public service in how they can use new approaches to deliver better government in the digital era.
- Maintaining, supporting & protecting our technical infrastructure & applications for both core Government and Health Care
- CDO empowers and enable teams to think differently about their approach to delivering programs and services[1].

The NSDS has grown to include a range of senior staff and is, on paper, a larger organization than many other

[1] Provided to the authors in correspondence from the NSDS

digital government units as it includes the legacy IT staff that were previously housed in the internal services IT service unit. In 2021–22, NSDS's budget was approximately $180 million and included over 700 FTE positions. The unit served over 55,000 users in over 200 organizations in core government, health care, education, the justice system, and related public sector entities[2]. While these figures and resources are impressive, they can be misleading in that they represent legacy IT staff who were integrated under the unified NSDS umbrella in 2019. Staff that worked directly on the Safe Check-in app was described as much smaller with less than a dozen staff from the NSDS working directly on the project (while balancing other projects), supported by a larger and more ad hoc team that included staff from a range of departments and agencies to deal with enforcement and border issues, public health, economic development, communications, and a range of other needs. ■

Image: Getty Images/Unsplash

[2] Figures and official functions provided by the NSDS staff in correspondence with the authors

Meeting the COVID Challenge: Nova Scotia's Test, Track, and Trace Response

The government deployed existing resources with a range of staff including public health officers, sheriffs, correction staff, and even environmental conservation officers stationed at physical entry points.

Since tracing the first active case in Wuhan China in December 2019, the COVID-19 (SARS-CoV-2) virus has had a massive global reach with detrimental effects on economies, social wellbeing and healthcare. As of 2022, over 5.94 million deaths globally have been attributed to the disease along with countless other health, economic, and social impacts (Global Change Data Lab, 2022). Governments have had to act in a quick and decisive manner to control transmission and protect citizens from the lethal repercussions of the virus. Subsequent variants including Delta and Omicron have forced governments to impose a range of public health and emergency measures. The response from many governments has involved sizable investments in digital government operations and direct-to-citizen service delivery (OECD 2020). Early predictions suggested the pandemic serving as a catalyst for digital transformation on a large scale (OECD 2020), but two years later the evidence remains unclear and contested (Clarke 2021; OECD 2020).

Like many other jurisdictions, Nova Scotia faced an early decision related to its COVID-19 approach to control and suppress transmission. In March of 2020, the Government of Nova Scotia adopted a test, track, and trace strategy which raised three operational challenges including border management, the design and operation of a Safe Check-in service, and a compliance and monitoring capability to enforce public health measures (Groff 2020). Initially, the number of Covid19 cases in Nova Scotia was comparatively lower than in many other jurisdictions with only 150 active cases in March 2020 and stabilizing around 1085 by the end of August 2020 (Health Canada 2022). With this understanding, a focus was placed on those arriving from other parts of the country and international travelers in particular. By mid month the Nova Scotia government had, in response to the first confirmed cases of COVID in the province, implemented a mandatory screening and 14-day self-isolation protocol for international travelers (The Signal 2020). This created a series of policy needs around both border management as well as tracking and compliance for public health. The government deployed existing resources with a range of staff including public health officers, sheriffs, correction staff, and even environmental conservation officers stationed at physical entry points.

Image: oksanaphoto

These points of entry included land and ferry crossings as well as airports and required staffing 24 hours a day, seven days a week. The deployment of staff to entry points, and the creation of supporting public service infrastructure to make that happen effectively, created a border management system where one had never been. To make it happen, interviewees reported working collaboratively with teams from across several ministries including Justice, Environment, Service Nova Scotia and Internal Services, Department of Health and Wellness, and Communications Nova Scotia. Frontline staff were put in place to inform travelers of their obligations under the Public Health Order, and ensure that Safe Check-in processes were completed and appropriate government monitoring of arrivals could be put in place. The public service also pulled together existing resources and capabilities to ensure that the data management, monitoring, and compliance required were up and running. As we detail below, the initial Safe Check-in app process would evolve dramatically in terms of the processes and requirements for travelers, but also in how the government itself leveraged digital ways of working to build and deliver something that worked efficiently. By the end of March 2020, with a growing number of active COVID-19 cases, Nova Scotia declared a State of Emergency under the Health Protection Act. To prioritize the safety and well-being of citizens, this involved implementing additional restrictions including capacity limits to public gathering, encouragement to cancel unessential travel plans, closure of tourist attractions, and implementation of new physical distancing rules (The Signal, 2020).

The fast moving pace of the pandemic meant that as infections rose within Canada, the Nova Scotia government had to not only address international travelers, but also determine appropriate measures to manage potential transmission from domestic travelers too. By July of 2020, the Nova Scotia government and three other neighboring maritime provinces adopted an “Atlantic Bubble” policy. This allowed for travelers who had not been abroad to come and go freely between the four geographically proximate Atlantic provinces of Nova Scotia, New Brunswick, and Prince Edward Island, and Newfoundland and Labrador. It also recognized and validated a 14 day self-isolation that had been completed in one of the four provinces, effectively removing the need to self-isolate twice if you traveled between the provinces. This policy was adopted given the comparably low levels of infection in the region and reduced transmission concerns in this region and reflected a longstanding high degree of inter-Atlantic travel for work and familial reasons in the region. The bubble would burst in November of 2020 due to a second wave of COVID-19 cases across Canada. Further highlighting the need for Nova Scotia to be ready to ‘check-in’ all the travelers looking to enter the province from near and far. ■

Building Digital Safe Check-in: Crisis Mode & Leveraging Existing Digital Government Resources

While the need for a viable and practical response to ensure public health was clear, there was less certainty on how to make it happen. Interviews revealed that the initial reaction was to turn to traditional public service methods: paper based forms supported by in-person phone call follow ups for compliance. As one interviewee put it, "their first go to, on the implementation, was a piece of paper.

Their first reaction wasn't we should make this an internet era thing – it was we should get a form developed" (Interview 1). Given the relatively new status of the NSDS and a predilection for traditional public administration responses on the part of the government, this was not all that surprising. The response was to implement a questionnaire-style screening form to gather information about travelers as a quick tracing strategy. The initial screening of travelers entering Nova Scotia was a bare-bones affair with a limited number of questions designed to solicit information to clarify who was entering the province, informing people of the need to isolate, and ensure they were complying with public health protocols. Those interviewed recall the sense of crisis and uncharted territory in trying to implement something that had simply never been done before. The entire check-in process involved completing a check-in form (physical or pdf), adhering to a 14-day isolation period, accompanied with daily phone calls to confirm isolation and health status. Travelers with different profiles (e.g. emergency/rotational workers) were later subjected to different check-in processes and corresponding isolation requirements to accommodate their exceptional status due to their employment (e.g. emergency staff) or frequency of employment related travel.

The initial response of a pen and paper based screening form along with a pdf counterpart was implemented at airports and all land crossings to safely check-in travelers. The NSDS team recalls a lack of user-centricity and vague instructions causing confusion among travelers particularly around the use of pdfs. "It was just easier for people. When you're coming down an escalator into an arrivals area and you see two kinds of tables set up and someone in a uniform handing out papers, you're more likely to go to that person and ask questions", recalls one interviewee (Interview 2).

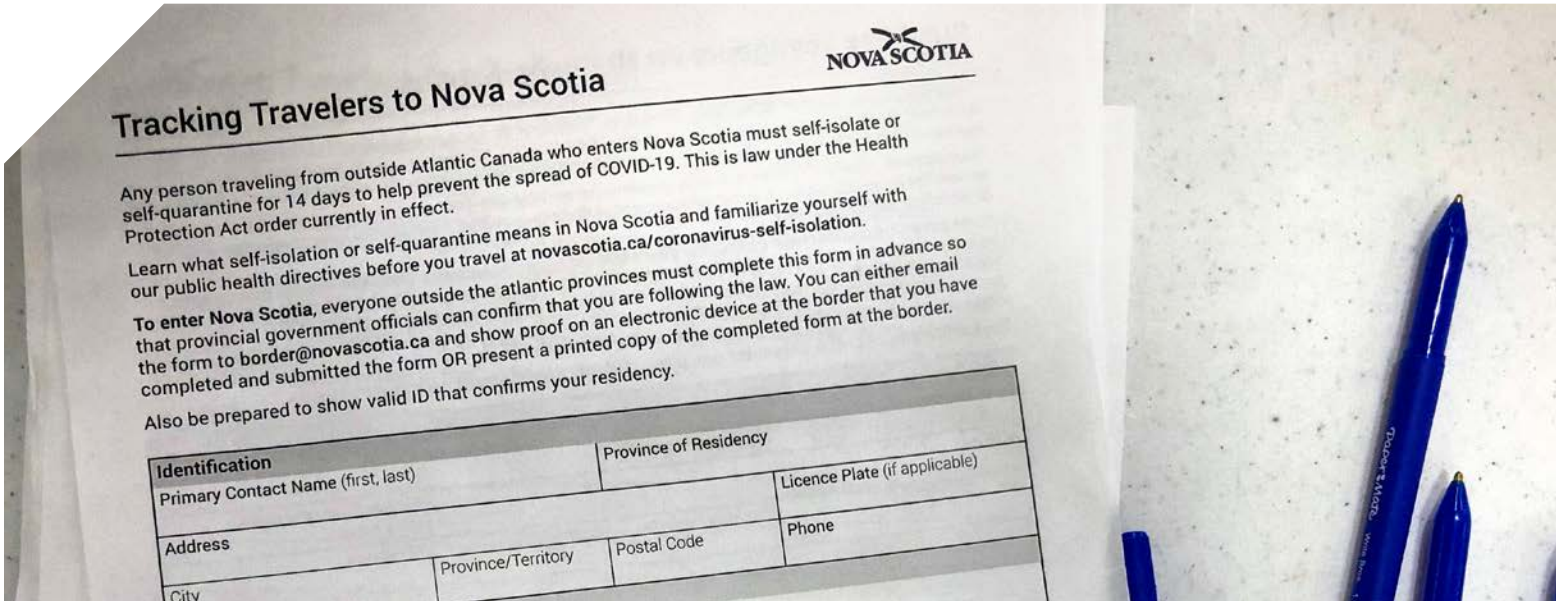

Image: Nova Scotia Digital Service

As a result, airport line ups to process the check-in forms began to increase and as with manual screening processes, sustainable information management (IM) and data collection became challenging due to the sheer volume of data. In addition, the early days of the paper based check-in process involved manually calling travelers by phone to verify their isolation and health status. One official explained that a government decision to manually phone individuals who were not compliant with the check-in requirements presented huge challenges. Government simply did not have the human resource capacity to do it given the volume of calls. Scrambling, officials called the NSDS parent department and after some discussion the very idea of a phone and paper based approach was put aside in favor of exploring a digital solution (Interview 7). Several interviewees emphasized that the choice of using paper based forms supported by phone call to conduct heavy compliance monitoring was a reflex. It represented falling back on the traditional ways of working where calls and call centers and paper based forms were the default. In short, the early days of the pandemic and Safe Check-in project were quick to surface manual check-in challenges. There were redundancy and complexity issues linked to the questions and a cumbersome and resource intensive compliance regime. Everyone involved quickly realized another solution was needed, a digital one.

Staff interviewed noted that work on the Safe Check-in app began almost as soon as the paper and phone calling approach was flagged as problematic. In collaboration with Public Health, the NSDS team began working on a digital product in July of 2020 which was deployed in parallel to the existing paper based approach. The NSDS created a simplified version of the questionnaire hosted through a web platform, supplemented with an e-mail reminder system that would contact travelers during their isolation period to verify their isolation status. Working with public health, the NSDS was able to get the online form to ask five or six basic questions, often with binary yes or no choices, to provide essential data to provincial authorities. The challenge was transforming a long

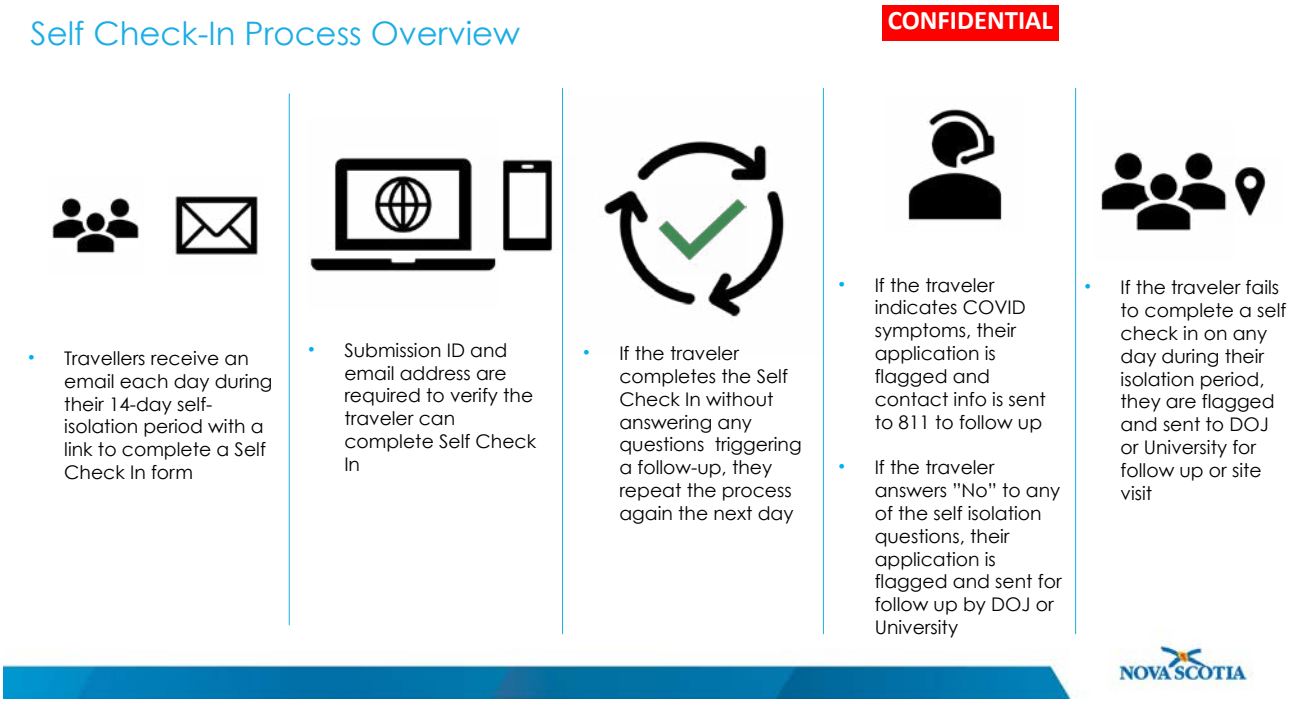

Image: Nova Scotia Digital Service

Figure 1: The Digital Government Nova Scotia Check-in

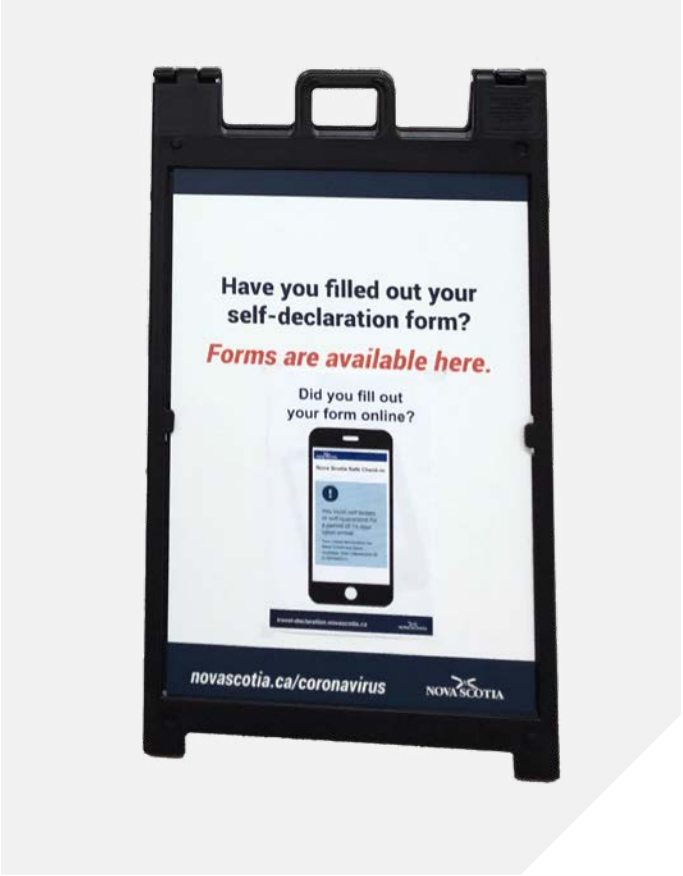

Image: Nova Scotia Digital Service

winded script that was used by phone to a set of approximately six questions and getting it to work well for a wide range of individuals trying to enter the province. The new app mirrored the paper-based check-in process with five key steps as set out in **Figure 1** that leveraged technology both on the front-end of arrivals but also to facilitate improved data collection, management, and ultimately compliance.

The paper based approach remained but long lines in airports and land crossings for travelers who had not checked in combined with capacity issues for manual phoning and data capture from paper forms were big incentives to move travelers over to digital channels. As one staff explained "In our late August [2020] iteration we had to make it more enticing to use the digital option. At the airport we created a fast lane, if you had your Safe Check-in done and we created more signage at the airport, QR codes up, you got to go through the fast lane. If you had paper it was going to take you longer. That worked so well that our fast lane became our slow lane because there were so few people doing paper" (Interview 5).

The NSDS team recalls their vision for a Safe Check-in app being a simple one; simplify the process of complying with public health regs when traveling to Nova Scotia, reduce lineups at airports, as well as gather pandemic related data such as demographics of travelers, app usage and reason for travel. In subsequent iterations the team would add vaccination status and a more sensitive triaging function to serve the various exceptions and user types that would be picked up in operation, all while adhering to security and privacy requirements. From initial design to prototyping, digital products can take several months but this luxury was not possible during a global health crisis. In order to meet urgent demands, the NSDS leveraged existing patterns of development, existing source codes, eligibility funnels, accessibility criteria and hosting platforms to create the Safe Check-in app.

This creates circumstances where minimum viable products (MVPs) are launched that forgo many critical aspects of product development (e.g. user research, persona mapping, needs assessments, visibility, accessibility and user testing) and are rapidly rolled out into production and iterated over time based on feedback. A truly agile development approach, that includes a discovery design and rigorous testing are no longer feasible in a crisis, since digital responses are needed rapidly. Interviews revealed that the NSDS capitalized heavily on pre-existing IT infrastructure and products. Staff noted that they looked to previous digital products and services which were already live and had gone through rigorous user research and tests; possessed understanding of how data pipelines, eligibility funnels and web analytics could be incorporated; and accelerated development by building on/retracing existing user journeys. TAs one staff member put it, "Because we were moving so quickly, we weren't able to do the user research that

we would typically do in a discovery phase. Something had to just get done. We could make some fairly educated hypotheses about the product because we did have reusable design patterns and we had some reusable pieces from other services. So our user feedback would be in real time" (Interview 1). This gave the developers more confidence prior to launch to withstand the incoming initial wave of users.

A second key feature of the NSDS response was leveraging other digital government platforms and services. The team recalled the abundance of value gained from leveraging the Government of Canada's GC Notify platform developed by the Canadian Digital Service (CDS) to carry out mass communication targeting incoming and isolating travelers. As one interviewee put it, "At certain points of the year there could be upwards of 7k people in isolation needing to be emailed every morning. We leveraged that tool to do that and that also gave us the ability to send text messages if we needed to. We also used it to send targeted communications, like rotational workers, if there was a policy change that would affect them" (Interview 2). The use of GC Notify took the available human capital and put it to work in more value added areas. Based on the United Kingdom's version, where the National Health Service team was able to utilize

GOV.UK Notify platform to help with new healthcare service rollouts and mass communication efforts (Eaves and Lombardo 2021; Stewart 2020). The partnership with the CDS allowed the NSDS to utilize the notify app to implement a different compliance model that allowed for a digital daily check in. It also provided additional functionality to 'push' communications out to those self-isolating and increased targeting ability to reach out to particular cohorts or groups or isolating individuals. Call center staff were reprofiled to call only those who failed to use the digital channel for their check-ins. Not only does this further emphasize the importance of reusable capabilities but also underscores the importance and impact of digital governments working in the open, and ensuring that products or their source code are readily available for others to use. In doing so, governments are able to build on existing services and leverage the cross-functionality of IT infrastructure to respond in a quick manner to emerging needs. While the initial build was completed for a generic user type, it soon became clear that a range of factors were prompting continued iteration to meet COVID-19 challenges. ■

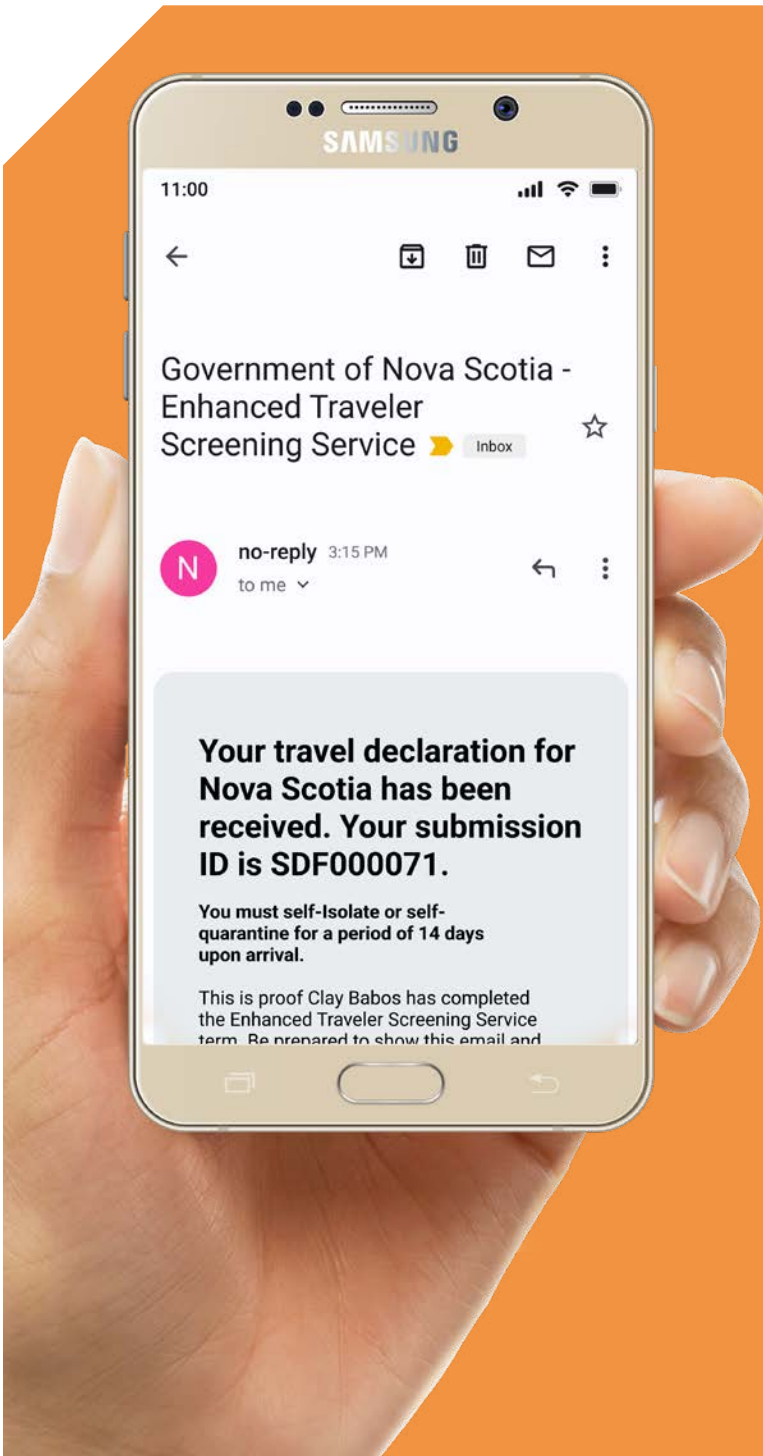

Image: Nova Scotia Digital Service

Shifting Policy Direction, Iterative releases, and Meeting User Needs

The initial success of the Safe Check-in app meant that there was now quantifiable data retained from those using the app, and feedback from front-line staff to point out design gaps, and unmet user needs. The reality of the crisis meant the NSDS team found themselves facing the ever changing circumstances given shifts in public health policy. At this point, original efforts around developing and fielding a MVP meant redefining design guidelines to accommodate the need for additional functionality stemming from policy demands and operational needs. In particular, segmentation of the features and process involved going through the check-in based on the nature of the visit or visitor. Many officials were quick to point out that several thousand international and out of province post secondary students arriving in the fall was a major catalyst to the iteration of Safe Check-in. An interviewee recalls "initially, the travel categories only included one option but the categories began expanding based on changing circumstances such as students returning to Nova Scotia after the summer or the large rotational worker population that needed to frequently travel for work" (Interview 1). Others noted that this was the first time that usability research had been completed as NSDS staff had breathing room to reach out to students and universities, but that again was far less comprehensive then it would have been in a more typical operating context. As one staff put it:

> To be honest it did not have the level of research I wanted it to have. Creating personas, archetypes wasn't something we could do. In the first round of usability testing in August [2020] we really focused on students. That gave us a really good insight into the overall student experience. For other types of experiences we really relied on our staff that were on the front lines at the airport and at the border. We had weekly meetings with them, probably more than weekly to check in what we are hearing, how many people are doing the paper versus the digital, what are the kinds of problems you are having (Interview 5).

Depending on the responses of travelers, the app's recommendation on required guidelines would vary. For example, rotational workers or emergency first responders would be subjected to modified self-isolation or testing requirements appropriate to their travel purpose or frequency. Iteration of Safe Check-in and the creation of additional 'pathways' for travelers to check-in reflected increased operational and policy recognition of implications for different traveler profiles that were exceptions to the norm, such as compassionate/business travel exceptions (funerals, end of life visits, work/school related travel, or child custody requirements). In such circumstances, the Safe Check-in app evolved as it was able to more fully respond to a diverse set of user needs and as policy needs and changes were introduced. The adaptive nature of the NSDS team was reflective through the app design, where constant iterations would be needed to match shifting public health guidelines and feedback from stakeholders. An interviewee stated "we would host daily calls with over 100 economic association's representatives to determine process functionality, public health order impacts on economic sectors, possible gaps, solutions to those gaps, business traveler needs and expectations, communication needs, and how a combination of these factors would affect the Safe Check-in development" (Interview 4).

However, interviews revealed that this cut both ways. Digital projects are often complex and policy can be informed by the constraints or experiences of implementation. More than one staff noted that the experience of implementing and iterating Safe Check-in meant that there was a dialogue between the digital product and the policy intent. As one staff put it "The data from the app impacted the public health order around articulated exceptions to Safe Check-in, where we had to develop a manual process to triage and line up with the public health order and then a process to work with the individual with the exception. It also had to connect back to the app eventually because that's what the people at the airport were facing" (Interview 4). The NSDS team also recalls adding/deleting travel categories; customizing to reflect the COVID testing requirements; rewording of the questionnaire for clarity/simplicity; and making user experience and interface improvements based on feedback from testing and surveys.

With each iteration and additional functionality added to the Safe Check-in app, the team was also able to offer dashboards that served to inform senior decision makers and operational staff, as appropriate, of the current usage of the app. **Figure 2** below provides an example which highlights the large number of total travelers and includes a variety of subsegments of users. Additionally, it points to the utility and high-usage of the Safe Check-in app and website along with the push and pull notifications that were part of the regular daily check-ins required to satisfy the policy requirements.

Figure 2 also demonstrates the high number of interactions and uses involved for Safe Check-in. There was little doubt that a high volume of check-ins were occurring given the public health order and the app provided much needed capacity to enable the front-end processes of declaring. Additionally, the compliance and follow-ups were required to ensure the system was effective. Data provided by the government indicates the app was highly effective, during the time period of August 22, 2020 to April 6, 2021, Nova Scotia Safe Check-in sent 909,308 emails and reported over a 90% compliance rate.

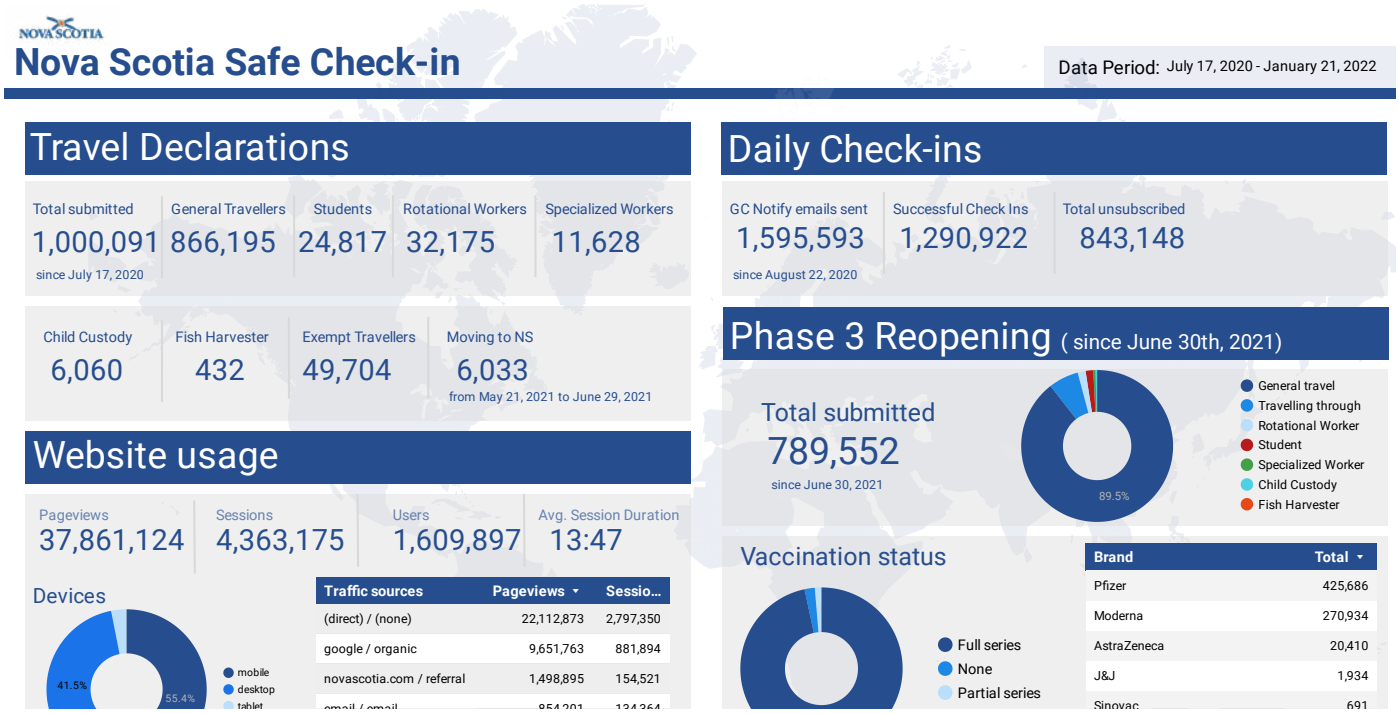

Figure 2: Dashboard of Safe Check-in Data Analytics

Image: Nova Scotia Digital Service

Coordinating Digital Government Crisis Responses

Early analysis of governments responses to the pandemic, in Canada and beyond have dwelled at lengths on the central challenge of coordination (Schnabel et al. 2021; Gomes et al. 2022; Lecours et al 2022). In the case of the Safe Check-in app, it was clear that overall the coordination was satisfactory. It was meeting the needs and the unique situational context of responding to a global pandemic and rising to the challenge of securing land and air transit hubs without a border service in place. While many noted that coordination worked well and matured as the Safe Check-in app was created and additional functionalities were brought on stream, others did note that it was "clunky" (Interview 3). The ad hoc and incremental approach of muddling through a lot of the coordination resulted in some inefficiencies and the nature of the crisis meant that senior staff were often on late night calls working through issues or developing strategies to facilitate digital work to alter or expand the functionality of the Safe Check-in app.

There was widespread agreement amongst those interviewed that while not perfect, the coordination of the response effort on the safe-check-in app was strong, though often ad hoc and sorted out on the go. The various players in the system, digital and otherwise, were able to effectively land on a strategy and bring together and apply the various personnel and other resources to deliver. Given the nature of the problem, coordination was needed on two fronts: to bring together a disparate set of teams and resources that typically do not work closely together; and, to determine how best to use digital government to complement other approaches and traditional public administration occurring to meet the broader COVID-19 objectives. From a safe-check in perspective, this was first vividly demonstrated as boots on the ground were needed at land crossings, ferry terminals, and airports. The in person front line staff had to be coordinated with a check-in process that was able to manage and leverage digital tools to meet the volume and functional needs of the government. Many of those interviewed noted there was a sense that a makeshift Department of COVID Response was taking shape. The urgency of the problem coupled with the quick responses needed meant that it was all hands on deck and interviewees noted that resources and capabilities were drawn in from wherever they were needed to make things work. New teams and staff from justice and environment were now working closely with public health, NSDS, and communications staff to turn public health orders into a public facing service that was easy to use, while integrating and leveraging the data from the app in service of broader COVID response goals.

Coordination evolved, quickly, with staff using various tools and resources including ad hoc meetings, Microsoft Teams channels, and regular senior staff phone calls at night to deal with the quick pace of policy change and coordinate operational requirements. To make this happen, it was clear from interviews that digital had to become more integrated into the senior level decision making and operational tables around government. When the decision was made to move from a paper based to a digital channel and application, it required a strong coordination of how policy goals would be realized through digital code. As one respondent put it "they were debating a policy. If you want the digital service delivered on Tuesday we need to make the policy decision today because whatever code is in the service come Tuesday morning is going to be your policy. Policy is code and code is policy" (Interview 1). Scaffolded coordination involving senior officials working through strategic and cross departmental issues in concert with the Premier's office and public health guidance

were coupled effectively with operational coordination by working level staff (Interview 7, Interview 1)

An early coordination challenge was noted to involve NSDS not being around decision tables. As the same staff put it, "Those traditional hierarchical programs and policies are in those rooms but digital is not. Interestingly, as time went on, and Safe Check-in evolved to include vaccine credentials, digital was in those rooms" (Interview 1). Others noted that a major issue was related to the coordination of timing. Decision making was happening rapidly and frequently with several staff interviewed noting that the demands and pressure were unheard of. In some cases with announcements made publicly about policy changes, for instance requirements for check-ins or durations of quarantining for various segments of the public, that would need digital solutions developed within days and sometimes hours. As one staff put it, "One thing we tried to get ahead of and I think with lukewarm success, was to inform not the policy direction but the timing of it. Because we want to find the balance of a pandemic and we'll do everything it takes to manage our staff's burnout so they're not working 24 hours a day 7 days a week because there's a commitment and another commitment" (Interview 3). Coordination thus spanned the what to do – with public health leading but informed by the practicalities of operational requirements at points of check in along with the working of the app, but also the coordination of resources and capacities to deliver under extreme pressure.

The digital ways of working adopted by the NSDS, and in particular the use of design sprints, whereby products and work are completed in short cycles and tested, were not only essential to the iteration of the Safe Check-in app, but were also a crucial tool for coordination. Some staff noted the use of regular standups and product showcase sessions to ensure that work was progressing and that various players were being brought together to effectively

Interviews also revealed that the recent organizational decisions had a big impact on how Safe Check-in coordination worked.

integrate public health, economic, and service delivery aspects along with identifying potential issues and solutions. Interviews revealed these were particularly important, and more frequent during the initial build and deployment, with less need as major choices and socialization of digital ways of working had happened (Interview 2). Staff recalls that regular demos to a larger set of relevant staff were used as a moment to announce and help coordinate new features that were linked to changes in policy such as customization of user bases (e.g. rotational workers, students) or app functionality. It was coordination in the sense that it served as a way to link together a policy change or feature development with government operations that may extend beyond a single government unit to deal with the COVID response.

Interviews also revealed that the recent organizational decisions had a big impact on how Safe Check-in coordination worked. The first was the small core team structure at the NSDS itself with about 30 FTE working within the NSDS on various COVID products and services and an even smaller handful of NSDS staff developing and launching Safe Check-in. The small size was credited with facilitating a tight team and reduction of unnecessary hierarchies and approvals, but was widely acknowledged to be unsustainable

in the long term with staff struggling to meet the pace of requirements. A smaller size of government more generally was also highlighted by several participants from within and outside of the NSDS. It enabled effective safe check in related work as staff knew who was leading other pieces and there were small degrees of separation between teams which could be closed and integrated rapidly. Coordination for Safe Check-in was also greatly empowered by the recent reorganization of key IT/IM staff in the province which saw NSDS and the broader IT/IM resources were all folded into a single organization. As one respondent explained, "There's no way in hell we would have been able to deliver this. The bun fighting that would have happened between those two organizations – why are you doing this? What do you mean you need to deploy this fast? It would have had to have been more committee meetings or something" (Interview 1). Others when pressed to describe whether there were any constraints or challenges working with IT/IM staff in government, the responses reported very positive and strong working relationships and coordination. The DevOps capacity within the broader NSDS was seen as crucial and the working relationship was widely praised. As one staff explained "Meanwhile we have this great DevOps team who is ready to go. We knew that in this crisis they would be able to get something up and running for us in the time we needed. We'd be able to reuse technologies we've used before so that we don't have to go through this rigorous process of any new technologies you're using and getting approvals. I would say they were also our biggest enabler, being able to work with us and work quickly (Interview 5). Another staff noted there was some resistance from the IT/IM staff in the ministry of health on questions of data flowing from testing and its integration into the NSDS data and services being used as part of Safe Check-in (Interview 2). Staff noted that this was resolved quickly given the pressing priorities to build and deploy and iterate the check-in app and its reliance on data flowing from public health testing. Data governance and the coordination of data within governments can make or break successful digital government work and in the case of Safe Check-in it was essential. ■

Adapting the Digital Playbook During Crisis

A theme that quickly emerged in interviews was a universal sense that the traditional playbook or approach of digital government had to be adjusted. For those working in the digital government services unit, this meant that the pace, shifting needs of government, and changing contexts required some adaptation of the traditional digital government playbook. In a sense, the bare bones or essential elements of digital government were brought to bear with the intent of additional rigor, functionality, and more advanced and comprehensive work to follow. Given the context of the crisis, this is unsurprising but nonetheless reflects a departure from most accounts of digital government initiatives. NSDS staff and others consulted within the system were clear that there were major demands for quick start up and subsequent iterations that precluded the typical approvals, digital milestones, and saw staff adapting existing approaches and leveraging key products, platforms, and working with policymakers as policy was developed and tweaked.

> "Because there was no rule book. You didn't know what rules you were breaking because the rules had not been written yet. With Covid-19, there was just a public health order and it kept changing, as long as we were following the health order we were good. And the health order was vague. We just followed

> that loosely and there were some things open to interpretation and some judgment calls. Some of them are judgment calls and I said to my boss 'am I writing health policy now by designing this? And he said, well I think you are kind of informing it because no one else is going to decide. If you decide these are the options we are deciding and they say it is okay, then that's the decision." (Interview 5).

As noted above, the lack of large-scale user research in the initial development of the App was also widely recognized as unorthodox. The Nova Scotian government needed an urgent digital response and this led the staff to turn to existing design patterns and repurpose existing in-house products to field an application quickly. When NSDS staff were asked about how user research and feedback shaped the initial designing and iteration of Safe Check-in, they were clear that there was no initial user testing in the traditional sense. The rationale was two fold: that patterns, products, and platforms being used had already been user tested and could reliably be rolled out, at least initially. Again the existence of a stock set of resources was a key contributor to the speed with which a response could be mounted, but also a key contributor to the viability of it, given it had been used in reasonably comparable scenarios. Some staff noted that they did conduct some usability testing, notably with university students and with universities as they iterated towards subsequent versions of the app. This was to at least ensure some views had been canvassed but it was only later that user feedback was formally undertaken and integrated.

Additionally, the traditional digital playbook was adapted to rely much more heavily and iterate based on feedback driven by front-line staff experience rather than actual users. The staff noted that they were in regular contact with a range of front line enforcement officers and workers at key travel points which resulted in a good understanding of what was and was not working in terms of specific and general Safe Check-in functionality. This included feedback from ECC compliance officers at Nova Scotia's points of entry, and feedback from employees who were making outbound calls to people during their isolation. While the spirit of digital government involving iteration, refinement and expansion of functionality was based on data, it was not user driven immediately. As noted above, there were other sources of feedback as well from a range of other key user segments as those became more important in developing exceptions and appropriate triaging of Safe Check-ins based on rotational workers, and exceptional circumstances.

The role of show and tells and stand ups – regular meetings where work was demonstrated or problems surfaced for action – took on particular importance in the Safe Check-in case. Staff noted that these were even more crucial than usual, particularly in the early days of the pandemic, to ensure that other public servants less familiar with digital ways of working could be socialized. As one official put it, "We would still be working with some teams that are still in the old ways of working or old ways of thinking, it takes time to educate people to have everybody on board. Some things you wished could go this way but it doesn't because you have to go through those old processes" (Interview 6). Stand ups and show and tells served as key vehicles to secure buy-in from others, and in some instances were also how big changes were announced as new functionalities were introduced based on changes to public health policies. One respondent explained, "In the early days we were constantly showing what we were doing, demoing what we were doing, getting feedback and tweaking it before we rolled anything out. We would have these big show and tells to say this is what is coming, this is what we are planning on doing. We'd had that back and forth to try and get buy in" (Interview 2). Several others noted that adapting the digital playbook in a crisis was primarily driven by the compressed timelines. One staff explained "What

Image: Jason Goodman

gets dropped in a crisis is the sequence and the order of magnitude of alpha beta live. We kept the spirit of user research, of alpha, the spirit of private beta, public beta, live was always going to be there. It forced us to not think of this as a linear process. How much we can do in the midsets has to be fit for purpose because we have until Thursday or every minute we're ticking we're leaving users behind" (Interview 3).

As noted above, a major challenge has been the ongoing need to recognize and modify Safe Check-in to deal with the categories of travelers. Initially a large influx of students and subsequently a range of health and essential workers along with an array of exceptions such as child custody arrangements. The NSDS revealed that of the more than 105,000 Travel Declarations received through the Safe Check-in application the vast majority, approximately 70,000 were from general travelers, while over ten thousand were post-secondary students, and more than sixteen thousand were from rotational and specialized workers. Ensuring that safe check in worked for these users reflects the broader evolution of the provinces COVID-19 response and attempts to balance the public health and broader societal and economic needs of various sectors in society. ■

Conclusion and Learnings

Undoubtedly many lessons learned and best practices will emerge from the digital government response to Covid19. The Safe Check-in case provides a window into how digital ways of working were applied in a crisis and how traditional public administration and digital government operated in parallel and, in this case, complemented each other. Interviews revealed that the unique crisis context was a major factor in expediting the Safe Check-in response, and the question still remains as to if and how digital government will blossom in the absence of a continued crisis of that scale. Interviews and document analysis revealed a shared set of learnings from the Nova Scotia Check-in, including:

- Governments need to be stewards of a baseline of digital government capacity. Safe Check-in's success was in large part due to the existing digital government human resources and existing digital products, services, and infrastructure in place.
- Interoperability and integration are essential. The initial and sustained success of Safe Check-in was in large part due to the reusability and interoperability of existing service and product components and platforms. Ensuring products and services are built on common patterns and platforms facilitate a rapid response and expansion and iteration. Similarly, using the Government of Canada's GC Notify was a clear benefit.
- Digital first responses are not always possible or may have to operate in parallel with traditional 'analogue' (physical, paper/phone based) approaches. A big part of Safe Check-in's work involved building public service and public buy-in to digital approaches. Boots on the ground at border crossings and phone calls were however an essential part of the overall government response.
- Dogmatic approaches to digital ways of working, particularly during a crisis, are not always optimal. Flexibility in how the intent and methods of digital government was essential to releasing quickly and iterating and using digital techniques more fully as time and resources allowed.
- Coordination was essential in the Safe-Check case. It required considerable effort to bring together teams that did not often work together, to implement digital ways of working where it was not common, and to attempt to provide enough lead time for fast paced policy direction to be turned into operational reality via the App. It was facilitated by a shared sense of purpose by committed and professional staff, and over time by more formalized structures and supports. ■

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