APPLYING DIGITAL WAYS OF WORKING:

Redesigning Ontario's Environmental Registry

POLICY READY

Digital Government
CASE STUDY SERIES

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UNIVERSITY OF TORONTO

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Digital Government
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Launched in 2020 this series takes an in depth look at a range of digital government practices and impacts in Canada and abroad. It provides rigorous and comprehensive accounts of successes and failures, and highlights the real world work of digital government.

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Contents

EXECUTIVE
SUMMARY

In October 2019, Ontario Digital Service (ODS) won the Amethyst Award for its work modernizing the Environmental Registry of Ontario (ERO). This was no small feat; the Amethyst Award is the highest order of recognition for excellence to recognize outstanding achievements by people, not programs, in the Ontario Public Service (OPS). What is involved in an award-winning digital government work? Established in 1994, the ERO was one of the first digital public consultation services in the world. Yet, by 2017, the "bulletin board system" upon which the ERO was based was outdated, and the Government of Ontario embarked upon the process of building a new registry from scratch. Working collaboratively, the ODS and the Ontario Ministry of Environment and Climate Change (MOECC) were the first to fully apply the Ontario Digital Service Standard (DSS) —a 14-point suite of best practices developed by the ODS in 2017 to guide digital government practitioners in their work. The story of the 2017-18 ERO redesign offers valuable insights regarding the real world of digital government implementation, as well as lessons about how best practices surrounding digital transformation in government may be formulated and improved. Based on interviews and a focus group with key officials involved in the ERO redesign, this case study provides a detailed account of the players, novel processes and digital ways of working that were applied. Analysis is also provided of the ultimate outcomes and major lessons learned for organizing digital teams, working with partners in and around government, and the constraints and limitations of digital government. While the ERO project helped galvanize the ODS and DSS, the future of both is unclear. Although DSS is currently 'in Beta' and therefore open to further refinement, it is not apparent what, if any, changes to the DSS will be forthcoming. It is similarly unclear what impact the ERO experience has had on how the ODS approaches digitalization projects, nor is it clear whether a central coordinating entity like the ODS will feature permanently in the Government of Ontario.

POLICY READY

1 INTRODUCTION

'Digital transformation' in government has drawn a lot of attention from both practitioners and observers over the past few years. More than a term used to describe the deployment of communications and information technology for governance and public administration purposes, digital government purports to be about new ways of approaching public problems. It emphasizes user experience and puts people at the heart of an iterative problem-solving process in which programs and services are designed and tested in real-time, with real users.

Improvement through iterations of project and design and implementation is germane to being "agile" —a term used to describe the experimental, trial-and-error nature that has been taken from the technology sector and applied to government program and service design and delivery (Mergel 2016, Mergel, Gong, Pertot 2018). Agile practices contrast sharply with the conventional "waterfall" approach to product development often used as a proxy for government policy-making more generally. Waterfall involves long periods of design, often bereft of any actual testing or experimentation, where products or services are developed and implemented after long periods of design without testing (Bason 2017). Rather, due to the innovative nature of digital transformation, the process of design instead follows the "chain link model" whereby prototyping and user testing occurs in "iterative sprints" (Kline and Rosenberg 1986; Gorans & Kruchten 2014). An agile, chain-link approach permits design teams to return to the drawing board multiple times as the product evolves from Alpha through Beta toward Live.

The case of the ERO overhaul is an exemplar for understanding digital government. In 1994, the Ontario Ministry of Environment launched one of the world's first online public consultation platforms —the Environmental Registry of Ontario (ERO)— as a means of fulfilling legislated public consultation and participation requirements outlined in the 1993 Environmental Bill of Rights. Despite being an early mover in digital, by 2011, there was a growing realization within government that the province had fallen behind in its ability to provide digital services to its citizens (Ontario 2018). Such was the impetus for the

relaunch of Ontario.ca in 2012, which is recognized as the government's "first experiment designing a website around user needs instead of government structures" (Abdulla 2017). The project involved the creation of a Cabinet Office Digital Unit to coordinate the design and construction of the new site. In 2016, following the success of the Ontario.ca project, and in the wake of a major policy thrust to make post-secondary education more accessible for Ontarians, the Cabinet Office Digital Unit was tasked with rebuilding the digital interface of the Ontario Student Assistance Program (OSAP). Meanwhile, new leadership at the Ministry of Environment and Climate Change (MOECC) set its sights

The case of the ERO overhaul is an exemplar for understanding digital government.

POLICY READY

on revamping the ERO. As the OSAP project approached completion, and as the ERO project got underway, the Ontario Digital Service (ODS) was formally established and work began on writing the Digital Service Standard (DSS) —a 14-point suite of best practices used to guide digital government practitioners in their work. The DSS itself encompasses the Service Design Playbook, which outlines generic tasks to be fulfilled during four phases of the service design process, namely Discovery, Alpha, Beta and Live.

With respect to insights on how digital redesign in government plays out on the ground, the case exhibits several important features. The project helped galvanize the ODS as an organizational entity within the Government of Ontario. This process involved the recruitment of co-founder and Deputy Executive Director of the US federal government's 18F digital service, Hillary Hartley, to the Ontario Digital Service in early 2017, where Hartley served as the first Chief Digital Officer of Ontario and Deputy to the Minister Responsible for Digital Government. Procedurally, the rebuild of the ERO was the first implementation of the DSS. Importantly, the DSS is itself "in Beta" while its Service Design Playbook is "in Alpha." Substantively, this means that both the DSS and Service Design Playbook are open to refinement as projects like the redesign of the ERO roll out, although it is not assured that either the DSS or the Playbook will be further revised.

The following case study is based on interviews with key MOECC and ODS staff (see appendix for more details). The study highlights the tentative and uncertain nature of many digital transformation processes in government. In the case of the ERO, "the user" was not a singular entity but was rather comprised of both public and internal government users, both of which were diverse groups, the preferences of whom were not well-known ahead of time. When differences exist in terms of background training and specialization between digital service staff and users, little will be known in advance about what will and will not work in a particular context. For this reason, design and decision-making procedures involving input, not only from users, but also "shop floor" personnel on design teams is heralded by insiders as integral to the success of this largely sui generis project. Whether consensus-based decision-making will unequivocally remain a best practice going forward remains to be seen. If and when the DSS and Service Design Playbook move past Beta and Alpha, respectively, extensive input from shop floor personnel on design teams may no longer be seen as necessary. Nevertheless, the context-specific nature of each project will persist regardless of how entrenched procedural best practices become. Because user needs invariably differ from project to project, organizations responsible for digital transformation

will have to internalize a culture of consultation and "agility" to some non-trivial extent if they are to be successful. If, on the other hand, competence for digital service delivery diffuses such that internal clients (e.g., ministries) can implement digital projects in-house, the need for consultation may be limited to circumstances in which it is necessary to ascertain the preferences of external clients.

On the previous point, the capacity of ministries to undertake agile digital transformation unilaterally is currently quite limited. Moreover, organizations within government are ill-poised to meet the challenge. Major obstacles include organizational preference for waterfall, as opposed to agile, and preference for Java-based programming, as opposed to open source platforms. Although the 2019 Simpler, Faster, Better Services Act authorizes the Chief Digital and Data Officer to make major changes within public sector organizations, pending approval from the Management Board of Cabinet, the magnitude of implementing government-wide digital transformation should not be underestimated. To date, digital transformation in the government of Ontario has relied on the ODS working through mandatory Digital First Assessment (DFA) processes with ministerial partners. While progress made to date is laudable, it should not be taken for granted that agile digital service delivery of the sort outlined in the DSS will become standard practice any time soon.

2 DIGITAL GOVERNMENT AND ONTARIO'S APPROACH

Virtually every government in the world is in the process of what has been dubbed "digital transformation" (Shepherd 2018). While public administrators and politicians often cite efficiency and improved services as a driver of digital reform, recent studies indicate that the main impetus behind digital transformation is external pressure; citizens and stakeholders want government to adopt digital methods of service delivery to improve usability (Mergel, Edelmann, Haug, in press).

The current state of the art for user-centred design was largely inspired by the 2011 book The Lean Startup by Eric Ries, the core principles of which were popularized on Reis' blog in 2009. A salient feature of user-centred design is the "minimum viable product" (MVP), which is defined as the version of a product (i.e., the prototype) that allows designers to most efficiently collect information from users about whether or not an idea is marketable. Rather than simply asking users how they would use a product, MVPs permit design teams to observe product users in action and to query them in real time. Procedurally, according to this approach, building an MVP is most easily achieved if design teams are organized according to agile principles, which were popularized by software developers in the 2001 Agile Manifesto. That is, arriving at an MVP involves "agile iterative sprints" over phases of product development, nominally: Discovery, Alpha, and Beta, prior to a product going Live. Discovery involves compiling information, assessing user needs and generating user "personas"; Alpha involves internal testing with a representative sample of users; Beta involves the launch of the MVP, upon which information can be collected from real users and used to inform refinements; Live entails the final product launch.

Although lean startup principles were established to inform business decision-making, they have been fundamental to digitization efforts in the US federal government since 2010. There, the concept of "minimum viable policy" caught on thanks to adoption of agile management practices by the US federal digital service 18F (Brown 2012). These practices were cemented in the ODS when 18F co-founder, Hilary Hartley, was brought on as Chief Digital Officer of Ontario and Deputy to the Minister Responsible for Digital Government in early 2017.

The process by which iterative policy design unfolds has been recognized as a challenge to, and a significant departure from, traditional reporting structures

in government (Clarke & Craft 2017; Dunleavy, Margetts, Bastow, Tinkler, 2006; Fountain 2004; Lindquist & Huse 2017).   While it is true that rituals germane to iterative policy design —like Scrum, daily Stand Ups, Show and Tells and other means of within-group reporting— contrast with the conventional image of a narrow span of control whereby subordinates report activities to a single superior in a chain of command, agile practices do not necessarily conflict with established approaches to public administration. For instance, although agile no doubt necessitates consultation among shop floor personnel on design teams, which may lend itself to consensus-based decision-making, personnel may nevertheless be organized according to a broad span of control under a single authoritative decision-maker. As discussed below, in the case of the ERO redesign, there was a single "product owner" within the ODS who, on one hand, cultivated consensus-based decision-making, but also often sought approval and buy-in within traditional government hierarchies, on the other. The implication is that consensus-based decision-making occurs within traditional hierarchies; and while respondents noted a progressive reduction in approvals needed as ministry personnel became more comfortable with agile practices, agile decision-making by consensus has by no means replaced traditional hierarchies. Furthermore, it stands to reason that product owners in most digitization projects will be internal to the relevant ministry or ministries, and thus part of the traditional government hierarchy.

FIGURE 1

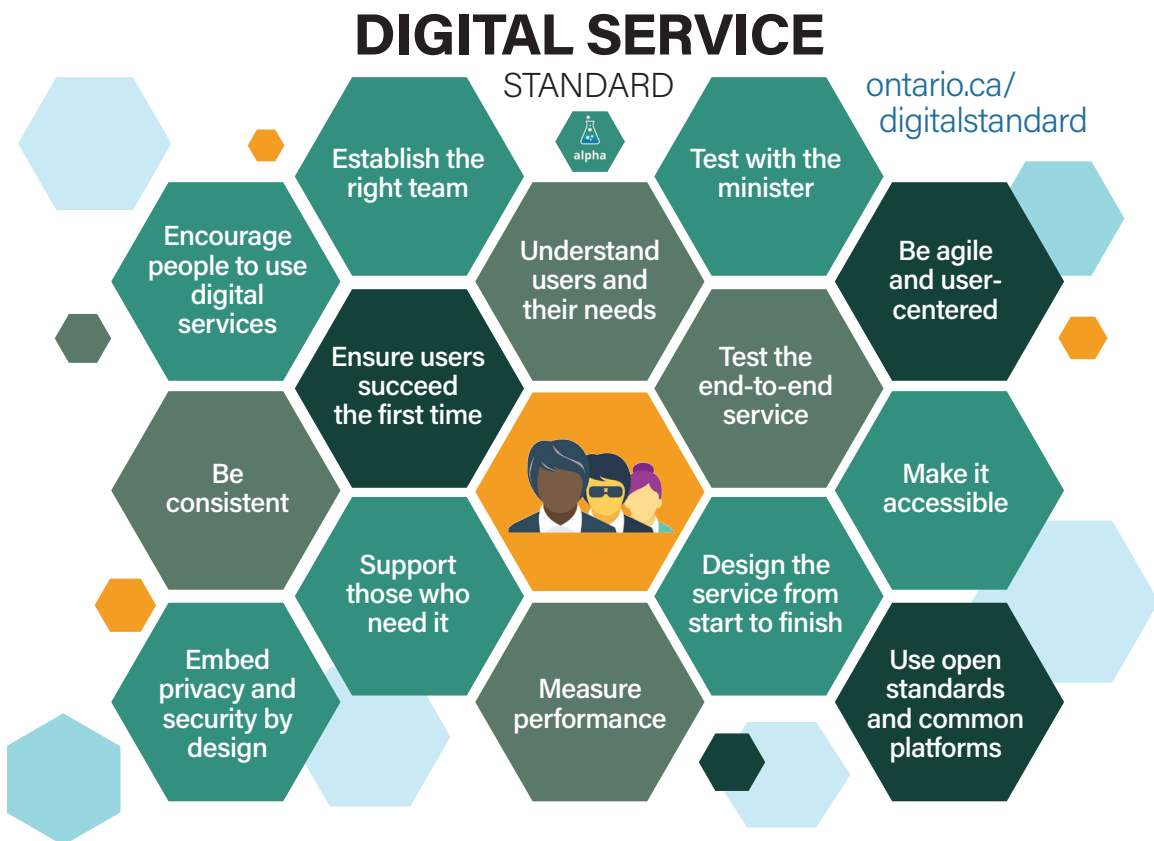**Organizational Chart of the Ontario Digital Service**
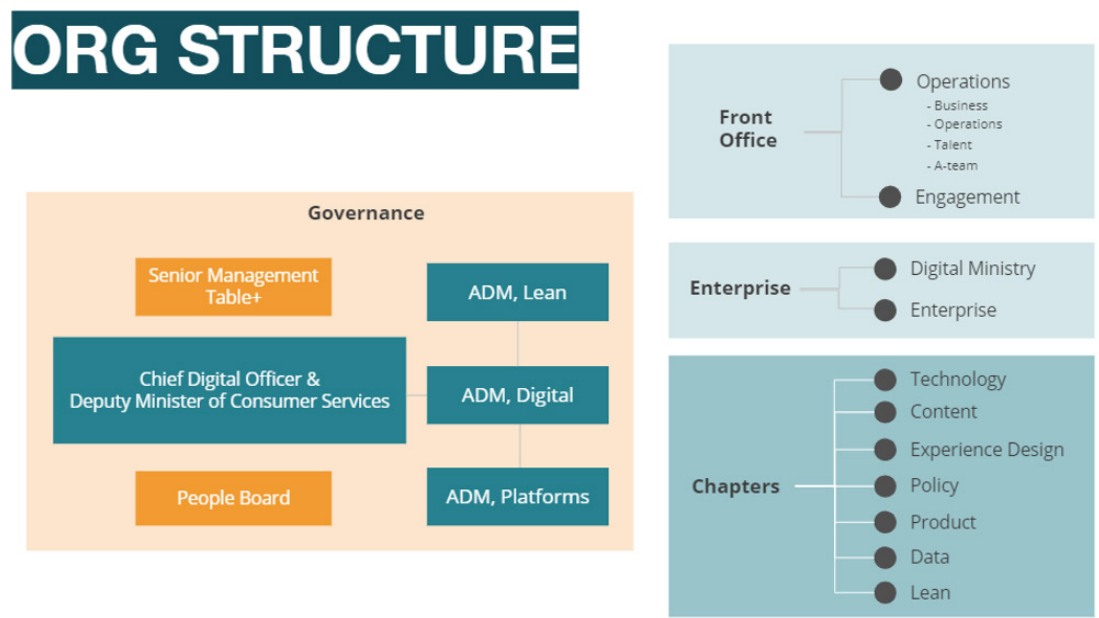
The ODS is currently located in the Cabinet Office, close to the centre of power in the Ontario government. The staff responsible for the ERO rebuild held positions within the Experience Design, Technology, Content, and Product Chapters of the Digital Office. Ownership of the product belonged to one of several Senior Product Managers within the Product Chapter. As detailed more fully below, staff from the Experience Design and Product Chapters co-located with the MOECC during the Discovery and Alpha phases of the rebuild, per the protocols outlined in the DSS.

The Digital Service Standard

The DSS is a list of 14 points that were created to help digital delivery teams, and the OPS more broadly, build and deliver effective and efficient digital government services (see Figure 2). The goal of creating one framework to help guide the development of digital government products helps to ensure that all digital services provide high-quality experiences for users in a consistent manner. Published in early 2018, the DSS was created to support the Service Design Playbook and allow users to understand the application of the service design life cycle in a more tangible way. The ODS team was responsible for leading the research and list of standards. The team conducted numerous user research sessions to gather feedback on DSS prototypes, and included a number of government perspectives such as: Ontario.ca team; Open Government Office; Information, Privacy, and Archives; Accessibility Working Group; I&IT Policy; ministry and cluster web coordinators;

I&IT community; policy community; and other various program areas. Through the conduction of numerous user research initiatives, the ODS investigated more on the application of the DSS in the OPS to help digital delivery teams and public servants at large across government succeed in understanding and applying the DSS within the confines of each unique product.

FIGURE 2

The Digital Service Standards (DSS)

DIGITAL SERVICE
STANDARD

ontario.ca/digitalstandard

- Establish the right team
- alpha
- Test with the minister
- Encourage people to use digital services
- Understand users and their needs
- Be agile and user-centered
- Ensure users succeed the first time
- Test the end-to-end service
- Be consistent
- Make it accessible
- Support those who need it
- Design the service from start to finish
- Embed privacy and security by design
- Measure performance
- Use open standards and common platforms

Source: Provided to the authors by the Ontario Digital Service

The Digital Service Standards (DSS) is an important tool in helping to support the technological transformation that is already happening within the public sector regarding the varying applications of what digital transformation looks like for public-facing service. With this factor in mind, the implementation and interpretation of the DSS is greatly dependent on the nature of each digital product that a team builds. Throughout the ERO's build, the team ensured that a user-centred approach was at the fore of their decision-making. The team's

interpretation and general sense of the DSS evolved throughout the process of the service design life cycle and the evidence-based approach that the user stories and feedback provided. Considering that 8 out of the 14 Digital Service Standards are based on the identified user needs for the specific digital product, user research, personas, and user stories were core practices and deliverables that the team integrated into their build process ensure a user-centric product. Figure 2 depicts the 14 Digital Service Standards, which 14 standards throughout the development of a digital government product. Therefore, the application of the that comprise the DSS was interpreted uniquely and will be further demonstrated throughout the following description of the redesign of the ERO.

3 REDESIGNING THE ENVIRONMENTAL REGISTRY OF ONTARIO

The ERO was first created as a 'bulletin board system' that allowed users to upload, download, read and contribute to a public message board. This system was one of the first online public consultation platforms in the world where members of the public were able to connect with the government on environmental issues. The online platform contains public notices about environmental matters that are being proposed by all government ministries included in the 1993 Environmental Bill of Rights. Since the ERO's inception in 1994, the government has viewed the system as being critical to connecting with the public on a range of environmental issues. The first modernization of the system came in 2007. This first digital overhaul of the system set out to implement new standards of web use and upgrade the technology of the online platform. These design changes were next revisited in 2015 when the Environmental Commissioner of Ontario recommended that the system was due for an upgrade because of the platform's dense technical language, complex layout and unclear search functions. The upgrade that the Environmental Commissioner of Ontario envisioned for the ERO was a full modernization of the system. In 2016 the Ministry partnered with the Land and Resources IT Cluster and undertook preliminary research, including an initial discovery and ideation, to explore what a new ERO could be in order to better serve the identified needs of Ontarians. The design and ideation sessions included team members coming together as a new project team to deliberate key features and functional elements that needed upgrading. The Ministry's ERO project team was able to identify a suite of potential features, and some new design concepts to begin with. The project team then began to research vendors and solutions, and reached out the ODS for advice with how to proceed with the modernization of the ERO.

For some time, a priority of the Environmental Commissioner of Ontario included the modernization of the ERO, as it was considered to be a critical system. In 2016-17, the MOECC, partnering with the MECC's Land and Resources IT Cluster, undertook preliminary research, including an initial discovery and ideation, to explore what a new ERO could be. Later on in 2017, the ODS partnered with the environment ministry's team to start a product rebuild of the ERO. The product's planning and building timeline was heavily based on the adherence to the DSS and Service Design Playbook, which both emphasize a user-centred and iterative approach. In May 2017 the team started with Discovery, the first stage of the

Service Design Playbook. They began by having an in-house team reviewing the existing research on the ERO's system and then interviewing internal and external users. Next, a cross-functional team with members from the ODS, IT and MOECC completed an Alpha phase where a prototype development was created. This phase occurred from July to September 2018 and included the team user-testing prototypes with a limited group of testers to ensure an iterative and feedback-driven approach to the process of upgrading the ERO. Development began in October and a feature-focused version of the new ERO was released as a live public Beta product in February 2019. The Beta stage in the Playbook allowed the ERO team to test the minimum viable product (MVP) in a live environment while continuing to build extra functionality into the system's digital design and usability. This MVP approach allowed the team to be iterative and agile as they formally consulted key ERO stakeholders and built the new platform in set stages of the Service Design Playbook. The process of building the new ERO exemplifies how government teams overcame bureaucratic barriers to implement user-centric design into the product's development and worked in an agile way to set the product on the track of product success.

FIGURE 3

The updated ERO landing page)
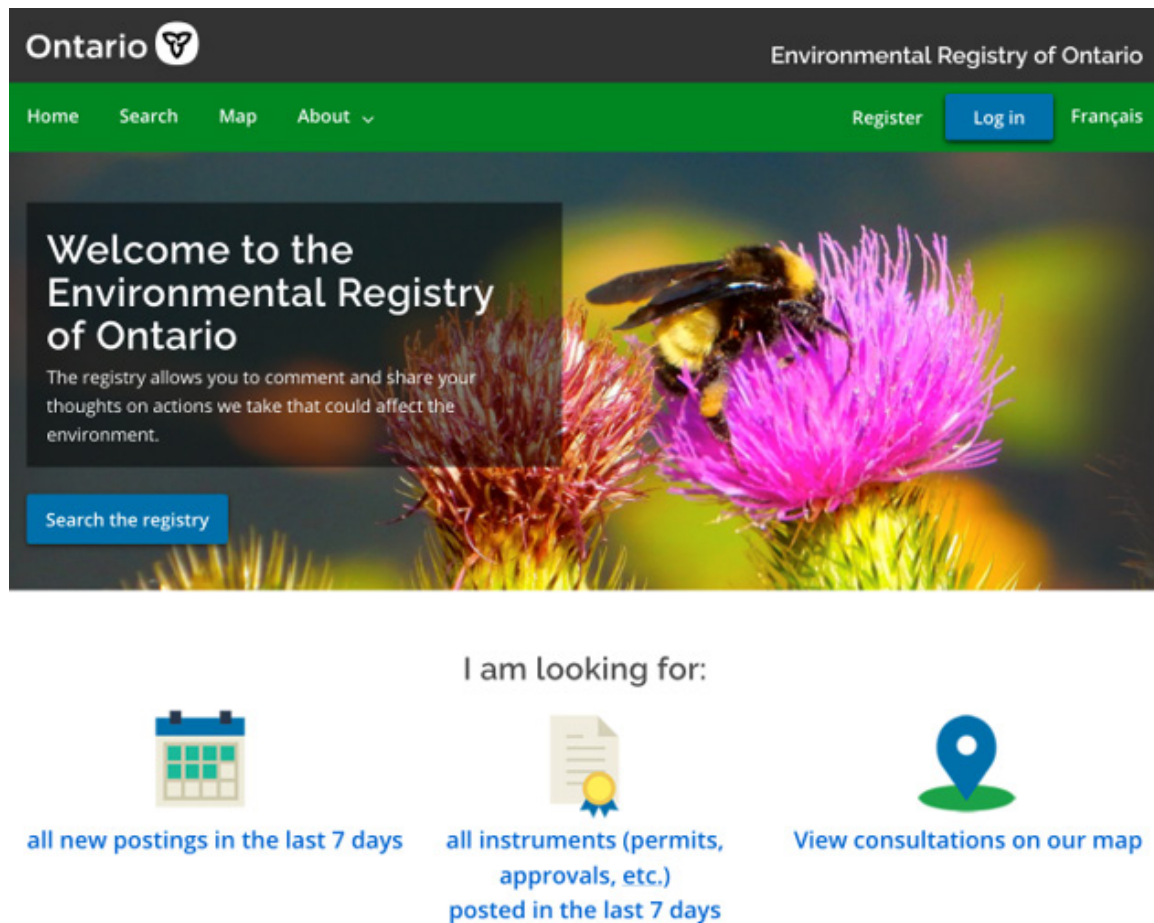
Source: Provided to the authors by the Ontario Digital Service

Figure 3 provides a snapshot of the landing page of the ERO Beta. Key features include a search function to locate acts, regulations, policies and instruments (i.e., permit applications and approvals); a comment function through which the public is consulted; an interactive map that displays the location of notices; and the ability to sign up for updates on proposals and initiatives. Importantly, consultation via web comment does not amount to a running comments thread. Rather, after deliberating the pros and cons of moderated feedback, and after receiving a "resounding no" from policy advisers and other key stakeholder groups (i.e. NGOs and activist groups) regarding the desirability of a moderated thread, the decision was made in favour of a system in which comments are vetted by MOECC staff prior to being made available through the ERO site.

4 APPLYING DIGITAL WAYS OF WORKING TO THE ERO REDESIGN

The MECC's preliminary research phase entailed the completion of initial discovery and ideation to explore what a new ERO could be in partnership with the Ministry's Land and Resources IT cluster. Through the preliminary research findings, the team was able to identify a suite of potential platform features, and then began to research vendors and solutions. It was at this step in the MOECC team's process that they reached out the ODS for advice. The ODS perceived this ministry partnership as an opportunity to approach the building of the new ERO in a new way. The ODS and MOECC team was assembled to be a cross-functional team tasked with rebuilding a new ERO from the ground up.

A Multidisciplinary Team

The multidisciplinary core team featured members from both ODS and MOECC included the following team roles:

- Product manager (ODS)
- Service designer (ODS)
- UX designer (ODS)
- Content designer / writer (ODS)
- Technology lead (ODS)

- Front-end developer (ODS)
- Digital communications specialist (MOECC)
- Subject matter expert (MOECC)
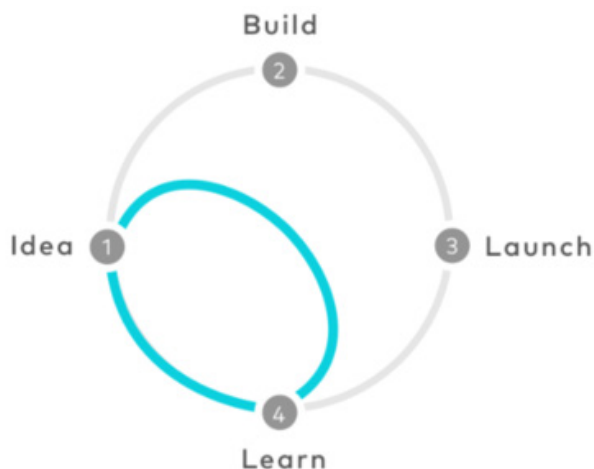- IT project manager (IT)

The goals of the multidisciplinary team regarding the revamping of the old ERO were based heavily on the DSS and the Service Design Playbook. The DSS outlines 14 core points that help digital service delivery teams build and deliver government services and guided the team throughout the modernization of the ERO. To support the DSS, the Playbook presents an outline for product teams working on implementing digital design and iterative ways of doing work. It is also important to note that any Internet-based, public-facing Ontario government project that involves the creation or improvement of a digital service needs to meet the DSS throughout its development and pass a Digital First Assessment. The Digital First Assessment process assesses a digital service delivery team's application of the DSS throughout the build of the product. Therefore, it was important that the ERO team integrated user-centered design in initial discovery and prototyping, while building the new platform in a highly collaborative way, from the ground up.

Using Agile Approaches

The process that the team followed throughout the duration of the project was guided by the service design life cycle and Google Sprint methodologies to ensure a user-centered and agile approach. It is crucial to note that the decision to adopt this particular sprint method was made by the ERO team and showcases the discretion and agency that existed for the team in applying the broader DSS framework. This technique meant that after team-building exercises and the securing of a private team workspace in the MOECC building, the ERO team comprised of both MOECC and ODS members worked in 5-day sprints to generate various designs based on continuous user research feedback. On Fridays, at the end of the 5-day work sprint, the team would present their findings at a 'show and tell' presentation, or sprint review, to a wider stakeholder audience. Show and tell presentation audience members normally included a variety of managers, ministry colleagues and any other organizational members who might have questions about the progression of the work.

FIGURE 4

The Google Sprint Cycle

Source: Provided to the authors by the Ontario Digital Service

The practice of Show and Tell presentations is intended to encourage the flow of continuous feedback and promote transparency in the workplace. In addition to weekly show and tell presentations, the multidisciplinary team also adopted the practice of a daily 'stand up'. Stand ups entail each member of the team discussing their work goals, challenges, and possible workarounds at the start of each day in the 5-day sprint work structure. This structure allows team members to give quick work updates, support one another in a timely manner and maintain work transparency. As depicted in Figure 4, the agile way of working using sprint cycles entails a great deal of iteration and team retrospection. In a more practical manner, the team ran through eight back-to-back weekly design sprints and were structured as follows:

- Monday – Brainstorm

- Tuesday – Refine ideas

- Wednesday – Build prototypes

- Thursday – Test with users

- Friday - Show and tell presentation to MOECC and ODS members and team retrospective

It is important to note that within this sprint model that the ERO team's work methodology adapted from, digital ways of working are centered upon the user and are not solely based on the specific work process and style. This means that as iterations of a product are developed, continuous user feedback is implemented. From user research initiatives, namely interviews and prototype sessions, the basis of the team's evidence-based decision making cycle established and allowed for constant ideation, iteration and trial by error. These three concepts are central to the team's application of the DSS and Service Design Playbook and are explained in further detail in the following section.

Discovery

The first service design phase, Discovery, began in May 2017 with an in-house team reviewing existing research and then interviewing internal and external users. The output of this research was the creation of a service blueprint map capturing all the processes and procedures involved in the interviews, generic user personas of key users of the existing system and a key findings report. In a collaborative manner, the MOECC and the ODS conducted a discovery and user research exercise in support of the modernization of the ERO, which introduced the ODS team to MOECC work content and procedure. User interviews were conducted from April 24 to May 25, 2017 incorporating participants from MOECC senior leadership, staff from across five prescribed ministries, the Environmental Commissioner of Ontario, environmental law firms and advocacy groups, municipalities, First Nations groups, business owners, and concerned citizens. The personas that were created in this phase of the service design lifecycle were an output of Discovery that guided the team's Alpha prototyping.

FIGURE 5

Ideation user research sessions for the ERO

Source: Provided to the authors by the Ontario Digital Service

Major usability and design findings at this first stage in the service design life cycle helped the team make major design and accessibility decisions regarding the build of the new ERO. For instance, interview findings at this stage highlighted that users were frustrated not just with the interface and features of the dated ERO system, but also with the general quality and consistency of postings. Additionally, interviewees explained that the design of the existing registry was biased to the processes and priorities of the environment ministry and wasn't easily adaptable to other ministries. This core user-research finding inspired the team to consider that a more adaptable design could be reused across government, leading to more cost savings. Following eight weeks of user research, and the presentation of key insights to decision-makers, the ODS had approval to proceed into the Alpha phase of the service design life cycle to focus on solving key problems identified in various user research sessions. As demonstrated in Figure 5, ideation was always highly collaborative, and work was completed in the open. The image depicts the ERO team's Service Blueprint session and was one core user research activity that contributed to the redesign of the ERO site in terms of its fundamental functionality and features. User research sessions allowed for the team to uncover major challenges in regard to the new ERO's design and content. For instance, interview findings highlighted that users were frustrated not just with the interface and features of the dated ERO system, but also with the general quality and consistency of postings. Identifying pain points like this early on in the design process allowed the team to iterate quickly and implement an evidence-

based decision making approach throughout the product design and build.

In addition, interviewees explained that the design of the existing registry was biased to the processes and priorities of the environment ministry, and wasn't easily adaptable to other ministries . This core user-research finding inspired the team to consider that a more adaptable design could be reused across government, leading to cost savings. Speaking to users and stakeholders of the ERO directly generated significant insight into user behaviour and specific system pain points and marked the beginning of the team's evidence-based decision making methodology. Following eight weeks of user research, and the presentation of key insights to decision-makers, the ODS had approval to proceed into the Alpha phase of the service design life cycle to focus on solving key problems identified in various user research sessions.

Alpha

The cross-functional team with members from the Ontario Digital Service, IT and the environment ministry then worked through the second phase in the service design life cycle, Alpha, keeping user-research findings top of mind. In order for the two teams to work effectively following the Google Venture sprint methodology, they were co-located for several months. The ODS team members moved into the ministry team's space and had a designated room to work out of for the bulk of the project. The act of being co-located allowed for each team member to be involved in user research and team-building initiatives. The initial joint-team user research effort involved a broad range of participants from a number of internal and external user groups.

In the Alpha phase, the team built a prototype development and user tested it with a limited group of testers to ensure the team's design and functionality choices that ran from July to September 2018. More specifically, the team focused less on expanding the consultative elements of the Registry and instead, concentrated on creating a simplified user experience and feature set that enable postings to be inputted, located, tracked and understood more easily. Over the span of 10 weeks, the Ontario Digital Service led a multidisciplinary team through daily design sprints. These design sprints produced one prototype per week and allowed the team to focus on a key problem area identified in user research that would be co-designed, tested and shared with stakeholders. The team remained co-located in one room throughout this phase to minimize interruptions and maximize outputs. The team's use of design sprints was the first instance such work methodology in OPS history.

FIGURE 6

An example of a persona created for the ERO redesign

Renu Regions

Behaviour
Uses the ERS to plan/stay informed as to what will impact her region in the future. Provides specific comments on implementation considerations. Works with other regions to prepare formal submissions. ==Interacts with ministry staff directly as she believes it increases the chances of her comments being considered.==

Frustrations
Angered when she misses postings. Has difficulty meeting commenting timelines. Feel ministries put too much pressure on regions and avoid confrontation with sensitive stakeholder groups. Disheartened by decisions she feels are made on political whims.

Desires
Wants to be involved in pre-consultation and to be notified of relevant postings.

Gender: Woman
Age: 47
Occupation: Director of Environmental Compliance
Location: Markham

"It's very clear when the ministry has a posting where they are actually looking for feedback "

Engaging directly with users and stakeholders of the ERO yielded significant insight into user behaviour and specific system pain points. In order to more accurately identify user preferences for the new ERO, multiple types of user personas were created by the team. The creation of multiple user personas allowed the team to leverage user research findings and design ERO features and functions for potential users. As demonstrated in Figure 6, the team's user personas were detailed and allowed a variety of user pain points and desires to be clearly mapped to the modifications within each iteration of the ERO. The team created nine unique personas and identified multiple user stories that were used in the team's show and tell presentations and daily stand

Engaging directly with users and stakeholders of the ERO yielded significant insight into user behaviour and specific system pain points

up discussions. In addition, the ERO team has noted that there are many ways in which the research has completely altered some of their original beliefs and expectations, which is one important learning of how user-research can better the build and delivery of digital systems. For example, during early deliberations as to the different types of ERO users the team initially thought some would visit the site to browse content. However, after user research sessions and the creation of user personas, the team better understood that the ERO site is not for casual browsers. Instead, the vast majority of ERO visits are purpose driven and short in duration. This finding allowed the team to understand more about the type of content design needed for these purpose driven users. Being co-located and applying a design sprint work methodology allowed team members to be hands-on with user research activities as well as contribute to and understand how evidence-based decision making was implemented throughout the build's process.

The fast iteration and numerous design ideas in the Alpha phase allowed the team to test with real users on specific features and requirements before decisions were made about technology and resourcing. The team's emphasis on product iteration and agile improvements ensured that they had room to pivot if certain features and functions were not meeting user needs. Throughout the design and build of the new ERO, the team completed 27 user interview sessions. In total, the team conducted 40 individual interviewed with over 50 interview hours and one full-day workshop mapping the internal processes. Speaking to direct users and stakeholders of the ERO throughout Discovery and Alpha generated significant insight into user behaviour and pain points in regard to its usability and design features. It is important to note that many of the assumptions of the ERO team were confirmed through this work, but that the user-centered and iterative design approach did also result in learning and design inputs that ran counter to initial expectations.

Beta

Next, beta product development began and a feature-focused version of the new ERO was released as a live public Beta product in February 2019. Before this launch, the first line of code was written for the new ERO in October 2018 and in November, a new web domain (ero.ontario.ca) was secured. These product milestones were accompanied by the creation of a staging environment where the team could build in the background without interrupting the current tool.

This feature was created by the ODS's Development Operations (DevOps). In this phase, the team's technology lead worked closely with DevOps to deploy and scale cloud infrastructure on demand, using Amazon Web Services (AWS), which resulted in modular components and reduced costs billed monthly. The cloud infrastructure provided the team with cheap, containerized and scalable infrastructure. Throughout the Beta phase of the service design life cycle, more features were added, and functionality improved based on ongoing user testing. Furthermore, the Beta MVP, an initial version of a live working website, took the team just 4 months to complete.

Following agile methodologies, the team was able to release over 20 iterations of the ERO without any added costs, sharing their work at bi-weekly show and tell presentations. By focusing on policies, acts and regulations, and leaving instruments (permits and approvals) and migration of existing content until later on, the team was able to deliver a MVP quickly releasing the site to t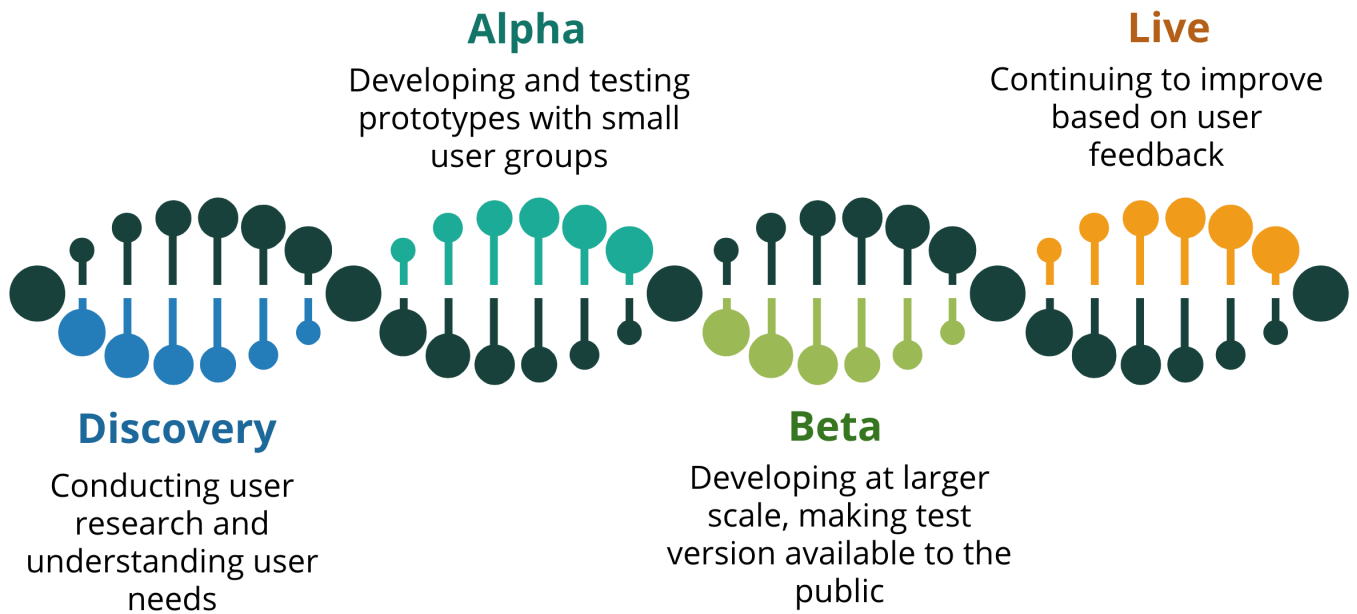he public in February 2018. Main feats in this phase of the service design life cycle included the team delivering the publicly available Beta site in just 9 months after the start of Discovery. At this point in the product build, the ERO team was able to reduce infrastructure costs by nearly 80% annually by using open source and cloud technologies. In Beta, the ERO team also received more than 30,000 public comments on the new site with 96% of those surveyed reporting a neutral or better experience.

The team was able to release over 20 iterations of the ERO without any added costs, sharing their work at bi-weekly show and tell presentations

In addition, the act of doing an in-house build replaced an approximate two-million-dollar vendor-led process, which is the more traditional route of product builds in government. The Beta phase, the third and second to last phase in the service design life cycle, allowed the team to test their MVP of the ERO in a live and interactive environment while extra functionality could still be built into the final product. At this point the ERO team had their sights set on a Digital First Assessment in order to move from Beta to Live, which was scheduled for June 2019. Furthermore, the Product ownership transfer from the ODS to MECP was scheduled to take place sometime in June 2019.

POLICY READY

User Needs

Alpha
Developing and testing prototypes with small user groups

Live
Continuing to improve based on user feedback

Discovery
Conducting user research and understanding user needs

Beta
Developing at larger scale, making test version available to the public

Source: Provided to the authors by the Ontario Digital Service

Live

The releasing of the new ERO site to the public occurred in February 2018. In April 2019, the new ERO launched instruments, permits and approvals, and revealed a new mapping feature. The Live phase of the service design life cycle is concerned with continuous improvement and the overarching goal of continuously monitoring, researching, testing and iterating for as long as the service is active. Furthermore, in Live the team continues to monitor and track the status of the service and key performance indicators, conduct ongoing user research and usability testing every three to four months, and continue building features from the backlog and releasing improvements to the service. In order for broad ministry users to get involved with the project, the ERO team also hosted plain language and writing for the web sessions for contributors across all ministries and implemented a mandatory summary for each posting, so public users can quickly and easily understand what the government is consulting on and what decisions were being made based on public comments on the new ERO.

In order to track data and other evaluative measures for the new ERO, the team used Google Analytics. As of April 28, 2019, all new and in-flight content was posted to the new ERO. This 'soft launch' was a signal that the new system was now operating as the system of record and would be incrementally improved. By monitoring the new site's analytics, the team was able to identify the number of unique users, pageviews, average session duration, and top search items. The ERO

team also created a Dashboard prototype to track the performance measurement of the site. The goal of the creation of an ERO product dashboard matched up with the government objectives of improving customer experience, transparency and cost savings with ODS and ERO team outcomes for the ERO. These ERO outcomes included user satisfaction being higher with redesigned services, delivery of the services being faster and more efficient through agile and cross functional collaboration, and the cost of the service per transaction being reduced through digital channels and processes. These identified outcomes were then correlated with Key Performance Indicators (KPIs). These KPIs generally outlined definitions of success as they pertained to the outcome, and in turn, overarching government objective. In order to more accurately measure ongoing user satisfaction, transparency and cost per transaction, the team tracked data by deploying user surveys and conducting a Hemingway analysis for plain language and retrospective inquiries to ensure ERO accessibility and usability for all users. These measurement items were all supported by Google Analytics, which afforded the team with statistical updates and information. While the aspect of measurement of the ERO was not built in to the Discovery of the new ERO, this project encouraged new and ongoing discussions on the evaluative aspects of digital products in government. Finally, the old ERO site is currently staying available online to act as an archive until the newly renamed Ministry of Environment Conservation and Parks initiates work to migrate all of the ERO's content.

REFLECTIONS AND LESSONS LEARNED

The decision-making style of a team working in an autonomous and agile manner contrasts the typical government waterfall style and hierarchy. The team's multidisciplinary composition and combined skills played a key role in the project's success. Members of the cross-functional MOECC and ODS team were selected to participate in the remodelling of the ERO based on the deployment team model. The deployment model affords team roles to specific organizational members based on individual skills and knowledge expertise areas that are needed for the creation of a specific digital product. In this way, both MOECC and ODS team members came into the project with different perspectives of work processes, expectations and digital product outcomes.

In this case, after some hesitation on the part of MOECC personnel toward agile practices, and after some discussion about establishing a steering committee, the ODS became the product owner of the new ERO and named one product manager to take on the role. The role of the product owner within the context of building a digital product afforded the team with a semi-formal leadership structure, however the team still made decisions based on a consensus model. This model is new to government projects because product teams are interdisciplinary and role-based, and work is completed in an agile and autonomous manner. Organizational members of the ODS are familiar with operating under this model; however, the concept was new to most MOECC staff who were used to working under a waterfall organizational hierarchy structure that currently permeates government work approaches.

The consensus decision-making model that the team implemented throughout the design and build of the ERO as the team was able to adapt agile work principles as the DSS and Service Design Playbook were applied for the first time regarding a digital government product. The team ensured a collaborative approach to agenda-setting via the exercise of "furious fours", sticker voting, and heatmap voting activities. These activities allowed for all team members to crowd-source ideas and identify high priority items and, in turn, decisions that had to be made. With that being said, in some cases the ODS Product Owner acted as a veto player regarding elements of the project's build and design. This point highlights the

importance of team role assignments and the influence the Product Owner has within this type of model. In fact, team members attribute the project's success to the team members assigned to each of the team roles. This point might suggest that the success or failure of a digital service or product depends on the expert knowledge and skill sets that are determined at the outset of the digital team role assignment and formation.

There are numerous lessons that public servants can learn from the overhaul of the ERO project in its relation to the DSS, Service Design Playbook, and agile work methodologies. The major lessons regarding digital product development in a government setting that the ERO has depicted are as follows:

• Team structure is important. Balancing the expertise of policy and program experts with digital expertise in interdisciplinary teams is a seemingly necessary condition for digital government.

• Digital ways of working involve combinations of traditional hierarchical decision making (e.g. product owners) but also necessitate a more collaborative design and decision making process where team members are actively engaged in meaningful ways during key design decision points

• There are new and emerging interpretations of agile and deployment model work within the public sector that offer promise but raise questions about generalizability across systems and projects.

• User research is an essential ingredient for digital ways of working. It produces important input that informs design and decision making processes, but could benefit from additional guidelines and standardization to ensure user research methods can be consistently and inclusively applied in digital ways of working.

• Understanding that the DSS and Service Design Playbook are best understood as general guidance and high-level expectations. Significant discretion exists at the project level for teams to achieve the DSS aims that reinforces the need to have well-equipped and experienced teams able to effectively interpret and apply the DSS.

• Digital ways of working often take longer and will be more labour intensive but can result in total savings and improved service outcomes.

• Evidence and measurement of digital work progression comes in many shapes and forms.

6 CONCLUSION

The ERO rebuild is an exemplar for understanding digital transformation in government. Not only did the project involve both external (public) and internal (ministerial) users whose preferences were not well established in advance, the technical vision in terms of features of the final product was also ambiguous at the project's outset. This study has detailed how the ODS worked through the DSS and Service Design Playbook to extrapolate user personas through consultation and undertake iterative design sprints. Design sprints, punctuated by Stand Ups and Show and Tells, involved substantial input from "shop floor" design staff at the ODS.

Although rituals that ostensibly promote collaboration can be employed as methods by which management monitors project implementation, in the case of the ERO rebuild, decision-making was highly consensual, despite the ownership role being filled by a product manager within the ODS. Organizationally, it is important realize that a broad span of control does not equate to consensual decision making. On the contrary, although there are many ways in which product ownership in a project like the ERO redesign could be shared, decision-making authority was vested in a single individual positioned within the traditional ministerial hierarchy. That the product manager opted to engage in ample consultation is significant, but consensus decision making should not be taken for granted. On the previous point, respondents indicate that had day-to-day decision-making been less collaborative, lower-level hierarchies would have almost certainly been re-established (e.g. ministerial steering committees).

Regarding the issue of product ownership, there does not seem to be an established best practice concerning where decision making authority in digital transformation projects ought to rest. In the case of the ERO redesign, had the project owner been at the MOECC instead of the ODS, the final product would have likely focused more on the needs of internal users within the ministry. If future owners of digital products are internal (e.g. ministries), due for to the wind down of the Ontario Digital Service, for instance, it is possible that internal needs will be afforded pride of place over the experience of external users. There is no guarantee that the efforts of the ODS to mainstream plain language will be sustained by digital teams at the ministerial level. Nor should it be taken for granted that internally-facing products will serve ministerial clients better if they

prioritize plain language over esoteric vernacular with which ministry staff are comfortable.

Importantly, the ERO case is not a story of government employees strictly following established protocols to effect digital transformation. Rather, the DSS and Service Design Playbook left considerable room to maneuver, as the specifics of what many of the processes entail are, as one interviewee put it, "open to interpretation." Whether or not the DSS and Service Design Playbook will be revised to reflect more precision, structure and rigor in their prescriptions remains an open question. As it stands, the Service Design Play book and DSS are themselves considered to be "in Alpha" and "in Beta," respectively.

The most pressing question surrounds whether government organizations have the capacity to sustain the agile work practices outlined in the DSS on their own. For their part, many IT clusters that serve government organizations are geared toward waterfall service design and use Java-based, as opposed to open source, platforms. Although interview respondents report enthusiasm for agile within IT clusters, organizational reform will probably be necessary. Although the 2019 Simpler, Faster, Better Services Act authorizes the Chief Digital and Data Officer to effect digital reforms in public sector organizations, pending approval from the Management Board of Cabinet, major questions remain concerning capacity and compliance. For instance, if the ODS is required to lead or facilitate digital transformation in every public sector organization in the province, the ODS will require far greater resources if the task is to be completed in a timely manner. If, on the other hand, the ODS is expected to wind down, questions emerge concerning ministerial capacity to undertake digital transformation unilaterally. Both scenarios assume that decisionmakers in public sector organizations prefer to implement digital transformation as defined in the DSS. It is unclear what would transpire if decisionmakers instead resist implementation of the DSS, as penalties for non-compliance are currently vague at best.

Although much remains to be seen, there can be little doubt that work undertaken by the ODS signals a consequential change to the way government conducts business. Digital transformation in Ontario is part of a global wave of reform that is bringing people closer to policy making. Although Ontario has taken many of its cues from the US federal government, the province is a forerunner in terms of digital transformation in Canada. The story of the ERO rebuild and other projects undertaken by the ODS offer many valuable lessons for other jurisdictions to impart as they take up their own digital transformation projects.

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APPENDIX A – INTERVIEWS

1 October 2019: Focus group with mulitple members of the Ontario Digital Service

18 October 2019: Interview with official, Ministry of Environment and Climate Change

6 November 2019: Interview with official, Ministry of Environment and Climate Change

8 November 2019: Interview with official, Ministry of Environment and Climate Change

POLICY
READY