Optimizing Healthcare Transitions

Innovation Partnership with Kingston Health Sciences

Centre, Bayshore and Verto

By Jamie Gamble





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Imprint Consulting

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ichael Millar, CEO of Verto, did a double take on the data. He was looking at a comparison between a manual, paper-based process and the new application that his healthcare technology company had developed for Bayshore HealthCare and Kingston Health Sciences Centre (KHSC):

"We got a 250% increase in administrative capacity, and I thought, this is wrong, let's look at the data again. And I think I looked at the data two or three times, and I realized that it was right. [...]There's so much potential for efficiency within existing resources inside the healthcare system."

The application-called RightPath - was developed to help Bayshore and KHSC to manage information and communication related to a 10 bed Transitional Care Unit (TCU) opened by Bayshore in December of 2017. This new unit helps Alternative Level of Care (ALC) patients to transition from acute care in a hospital (in this case KHSC) into more appropriate home and community care settings. Some patients face longer rehabilitation or convalescence, need to wait for home or community care services, or learn new coping skills and strategies. This could take weeks or months, and the hospital is not a good place to do that. Staying in hospital takes space away from acute level patients who need immediate care, and exposes ALC patients to hospital borne risks, such as secondary infections. In helping ALC patients move from acute care sooner, while still receiving the care that they need, this helps open more bed capacity within the hospital.

ALC is a complex issue that affects patient care, patient safety and patient quality of life. Prematurely returning home or into a long-term care solution, without sufficient readiness to manage their condition or connection to the appropriate community supports, can result in costly downstream consequences for the healthcare system. For example, these consequences could include: readmission to acute care, cancellation of scheduled surgeries and procedures, or accelerated functional decline. Transitions in care can also present risks to patient safety. Limited clinical information and poor inter-clinician communication can reduce the effectiveness of these transitions.

Bayshore HealthCare provides home and community healthcare services. It is a Canadianowned company with over 100 locations across Canada. Bayshore has more than 12,000 staff members and provides care to over 200,000 clients.

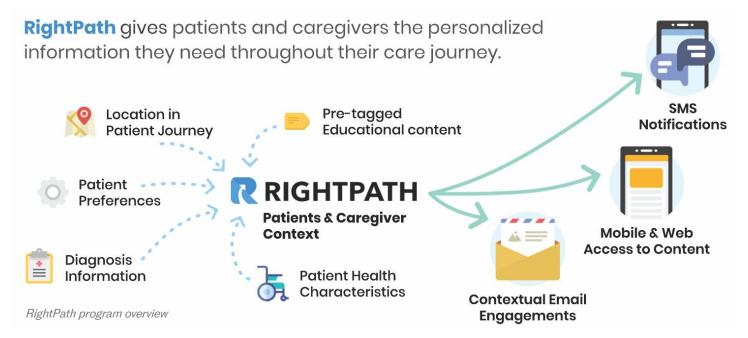
Verto is a healthcare technology solutions and services company that focuses on creating tools that are optimized for integrated and collaborative care. Verto is privately held, based out of Toronto, and has 18 employees.

Kingston Health Science (KHSC) is a complex, acute and specialty care, research and teaching hospital. KHSC serves 500,000 patients annually, has 5.000 staff, more than 2.000 health-care learners and 1,000 volunteers. KHSC is fully affiliated with Oueen's University.

The TCU is an intermediate solution between being acutely ill and returning home or transitioning into a long-term care solution. The TCU helps patients to be empowered in their own care, ready their formal or informal caregivers, and support them in accessing and navigating existing community resources. The TCU helps to prepare the patient, and their families, for the longer-term change.

RightPath: An information management platform for **ALC** patients

The Kingston TCU had not yet opened when Bayshore and KHSC put their challenge forward for the IPPCD program. In the lead up to the unit opening, they were already anticipating that technology could help optimize the use of the TCU. In the preparation to open the TCU, they anticipated that a software tool could help them more effectively support the transition and ongoing care of ALC patients receiving care in the TCU. The main issue that they anticipated was lack of extra support for caregivers, and this was the impetus to start to look for solutions that could



improve the efficacy of how the TCU supports ALC patients. They brought this challenge into the IPPCD program and partnered with Verto to co-design a solution that would improve case management, and in doing so improve patient outcomes, and reduce readmissions. The Bayshore-KHSC-Verto collaboration was a technology experiment that happened in parallel to a clinical delivery experiment. There are other TCUs in Ontario – in Toronto and in London, for example - however, it is a fairly new idea within healthcare, and this was the first one in Kingston.

RightPath is an information management platform that organizes the tasks and care resources that support ALC patients. The premise is that with an improvement in data quality, there is a decrease in administrative burden at the TCU. Combining this with the capacity to enable real-time support for patients and caregivers, and improve access to information to facilitate resource navigation, the solution would also reduce caregiver burden and burnout.

RightPath was developed using a co-design process supported by the MaRS IPPCD program. The partners who collaborated on the development of this solution were Verto, Bayshore HealthCare, and KHSC. RightPath provides:

- clinical process standardization,
- coordinated case management activities,
- a clinical case management tool,

- alerts and supports for different preferences for communication for different audiences, and
- access to information through an ALC patient and caregiver portal.

RightPath is currently used by the Nurses at the Kingston TCU, the TCU manager and Bayshore's Regional Manager. As the full functionality of the software is ready, it will also be used by KHSC Patient Flow Coordinators, as well as patients and their families or other care-givers.

The Benefits of RightPath

The value of using RightPath is being demonstrated for all levels of users, such as the integration of data collection, information sharing and overall management of the transitions of patients into and out of the TCU.

Nurses are able to more efficiently coordinate tasks with other nurses and other clinical treatments for TCU patients. RightPath makes the review and management of this information very efficient. What might have taken up to an hour can now be accomplished in minutes. The primary benefit is that it gets a nurse out on the floor providing care much faster. It also manages what tasks have been done, and reduces the inefficiencies that result from tasks that are missed or unnecessarily repeated.

The manager of the TCU is responsible for managing the referral and assessment process, and for running the transitional care program. With RightPath they can review all current tasks in the TCU at once to see if they are completed. Previously, that would have to be done with every paper chart individually, which was very time consuming. A critical communication step is regular updates between the TCU Manager and the KHSC staff responsible for managing the flow of patients in and out of the hospital. KHSC's Patient Flow Coordinators review current and anticipated availability of beds. With RightPath, they have automated updates of the TCU's bed availability and discharge dates.

For Bayshore's Regional Manager, RightPath provides remote access to consolidated information about the status of pending discharges, admissions and referrals that are waiting. The dashboard capabilities automatically pulls the length of stay, the bed capacity, ALC days prevented at the hospital because of the operations of the unit of RightPath support the Regional Manager in reporting on metrics.

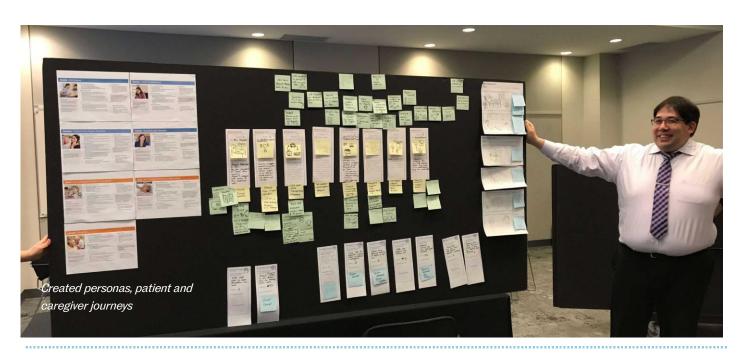
Once the fully functional software is ready, the value of using RightPath will be extended to others.

The TCU receives many calls and messages from caregivers and family members. As a result, there is a lot of "phone tag" back and forth trying to leave messages, coordinate appointments, and provide updates for to family members. RightPath will provide all of that information in a single, automated point of contact accessed through an app or a web-based platform. The TCU's Regional Manager observed, "Sometimes families are reluctant to ask questions knowing how busy everyone is at the unit – and this will make it much more efficient."

Once patients are discharged from the TCU, the ability for patients and their caregivers to access information through RightPath is expected to decrease stress on caregivers. "[Caregiver burnout] is probably one of the main reasons why a lot of patients return to the emergency department [...] With this solution, we will be, providing that information and preventing them from being overwhelmed." As RightPath is more fully implemented, it will be valuable to test the extent to which it helps relieve caregiver burnout.

The IPPCD Program and Co-design

One of the main objectives of the IPPCD program is to create solutions that are a better fit with real-world healthcare contexts by involving end users and all stakeholders in shaping them. The process starts with a challenge brief written by the healthcare provider. In the brief, the healthcare provider describes its challenge, the outcomes it seeks and the criteria it will use in selecting a vendor. Interested vendors respond



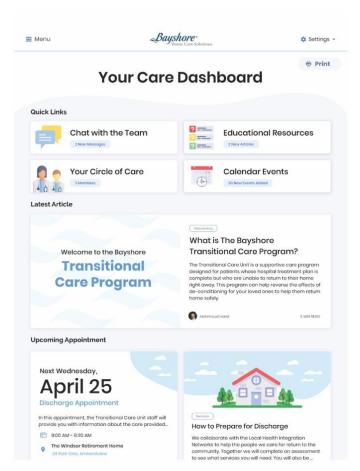
with innovator briefs describing their proposed approach to overcoming the challenge. Healthcare providers review the submissions to determine a short list of vendors and then invite them to pitch their innovative approaches to tackling the challenge and discuss potential solution possibilities.

The selected vendors and healthcare providers apply user-centred design principles and other rapid prototyping methods to identify and deal with the risks of introducing innovation in a complex healthcare setting. The teams are supported with hands-on codesign workshops at MaRS and regular review sessions with the MaRS team. This phase is iterative and can have many design cycles. Based on the insights gained from previous iterations, the provider and vendor team scopes a minimum viable product to evaluate outcomes and a viable business model for procuring the solution. The team uses the results to make a final decision on whether to move forward with procurement.

With IPPCD, MaRS engaged healthcare procurement experts, care delivery organizations and the technology venture community to create a process for new forms of collaborative value creation by:

- providing a structured process that is compliant with the Broader Public Sector Procurement Directive, but still allows for flexible application of the process for different types of projects;
- facilitating innovation partnership formation through broad yet targeted networks and dialogue processes;
- providing guidance and accountability through workshops, bi-weekly check-ins and resource materials; and
- designing and administering grant incentives for participants to help cover the cost of procurement using a novel approach.

At the Vendor selection day, Verto pitched to multiple challenges and Bayshore met with five different vendors who were interested in responding to their challenge. As a company, Verto was increasingly focusing on patient and caregiver engagement within their chronic disease management platform. Verto was familiar with co-design, and had integrated problem definition and persona creation into previous development efforts. Verto came into IPPCD having



The RightPath patient and caregiver dashboard

developed core functionality in two applications: MyMerge- a tool that maps a journey of a patient in a clinical situation, and CareHub- a patient tool that facilitates information sharing.

Bayshore and KHSC had crafted their challenge as: "How can we better support ALC patients and their caregivers to enhance transitions between care settings and back to the community while providing long-lasting benefits for patients and their caregivers as well as for the healthcare system?"

The opportunity to work closely with Bayshore in a codesign environment was appealing to Verto CEO, Michael Millar, "I wanted to have a more real-world environment where we had access to patients and caregivers, where we could test out those different approaches, and the one that resonated the most was Bayshore." Bayshore and KHS were impressed with Verto's experience working with hospitals, and they felt that they would have a good working relationship. Verto was selected after evaluating proposals and the vendor pitches.

In response to the challenge, Verto, Bayshore and KHSC agreed on a set of co-design objectives:

- 1. Identify the most appropriate patients to transfer to the TCU
- 2. Reduce patient/caregiver stress associated with TCU transfer and stays
- 3. Ensure that patients and caregivers have sufficient supports when transferred "home", allowing them to self-manage after discharge
- 4. Enhance scalability of this model of care to new hospitals and additional TCUs to support a greater number of ALC patients and caregivers

This project did not receive the initial IPPCD grant of \$25,000. The program's judging panel thought the scope was too large for the timeframe of the IPPCD program. Verto, KHSC and Bayshore were surprised they weren't supported. Verto had a good understanding of what KHSC and Bayshore's objectives were, and Bayshore had already decided to invest in innovation in this area. Together, they felt it was a good fit, and Bayshore felt strongly enough about what Verto was proposing that they decided to invest \$25,000 directly. Together they participated in the IPPCD program, and even though they did not get the initial grant, they were still able to be in consideration for the program's final grants: up to \$25,000 could be awarded to healthcare providervendor partnerships to procure a successful solution by IPPCD Solutions Day.

As Bayshore and Verto started to work their way through the co-design, they were getting feedback that how they communicated the problem and the solution was confusing to others, for example, the IPPCD advisors. They started to work on tightening up how they spoke about the problem and possible challenges, this led to a new understanding of how the challenge was defined, which in turn prompted a reframe their solution. They discovered that in order to properly manage a patient journey and make it useful for clinicians, they needed to integrate the two applications that were part of the initial pitch - Mind Merge and CareHub. Up to this point, these functioned as distinct solutions: one for clinicians and the other for patients and caregivers. This needed to change. Said Michael Millar, CEO of Verto, "I thought we were going to go in, and take the wisdom from our previous projects and see how it fit in the ALC. What

we realized is that our whole concept of separating the platforms is wrong."

This insight turned into an existential moment for Verto, which prompted them to break down the components of their existing platforms and reimagine them as a more integrated whole. This change had major architecture implications for their technology, because it centralized the entire engine that is at the core of the software. What Verto was hearing was that patients and caregivers wanted visibility and transparency into the entire process, and to be empowered in their care. Integrating the solution into one platform would enable this.

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As a result, Verto has a solution that they think could apply to the whole chronic disease spectrum. This is a major shift from the original concept of the cancer care model that the company was founded upon. Their solution can draw from multiple sources and different hospital systems, amalgamate it into centralized data, and then, by using an algorithm, determine the best medium for sending out that information. This development emerged from Verto's work with other healthcare providers (other than KHSC-Bayshore) which allowed them to model the solution in different contexts.

Co-design was critical to the understanding that informed these changes. By spending time in the clinical environment, Verto got a nuanced understanding of the patient and the clinician. Different patients have different information preferences. If someone is dealing with an acute event, for example a broken leg, they may prefer more immediate and frequent information via an email or text message. This may differ, for example where someone is trying to improve or work on managing their chronic disease. They may want more functionality and may be better served by downloading and using an app that helps shift behaviour around managing the condition.

Challenges with Co-Design

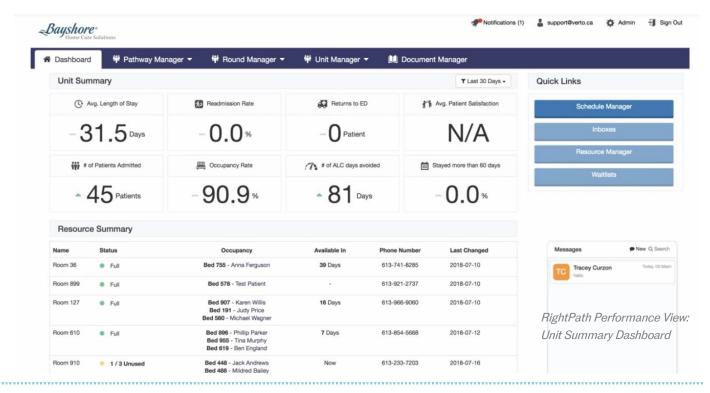
The testing of RightPath was challenging because the TCU was opening at the same time as the RightPath solution was being developed. There was not a long history of baseline data that could be used to compare the manual processes with the new, proposed digital processes. The decision was made to let operations at the TCU stabilize, and begin with more traditional manual data recording processes. Following this, RightPath was introduced and tested. The TCU nurses worked for a few weeks with no digital tool at all, and then with Right Path. Metrics for administrative efficiency were developed by comparing the time it took to manually monitor and administer tasks in comparison to completing the same tasks with RightPath. Patients and caregivers used a prototype version of the tool for a few weeks, and were asked their opinions on how helpful

they found it. The result was reduced caregiver anxiety, increased perceived preparedness, and increased perceived access to resources.

There are some limitations to the evaluation given the stage of development of the TCU and the limited degree of functionality that was turned on with the solution. At the time of testing, the TCU did not have a waiting list (although it is anticipated that it soon will) so as soon as a patient was ready, a bed was available. Similarly, it is too early to assess the long-term health outcomes of the ALC patients that come through the TCU. In time, it will be useful to confirm if RightPath helps clinicians, patients and caregivers to stabilize patients' long-term care and recovery so that they do not end up back in the emergency department.

Procurement

Even though the three partners were not initially successful in winning the initial IPPCD grant, the partnership was successful in winning the final grant which has helped solidify their future working relationship. Bayshore's procurement interest was very strong from the outset of IPPCD. Their commitment of \$25,000 to the co-design process signaled their seriousness. Both KHSC and Bayshore



are interested in scaling. KHSC expects to expand and integrate their use of the solution in order to access summary reporting directly and to help identify the most appropriate patients for transfer. Bayshore has moved more aggressively towards scaling the solution into other areas. The way that the procurement worked out was beneficial to Verto in that it set up a partnership for scaling the solution to other Bayshore sites. The solution is appropriate to Bayshore's scaling aspirations. RightPath is currently most applicable to the actual TCU unit, although it could be interesting to explore how it might apply in other ways for KHSC and Bayshore.

Procurement of this solution turned out to be somewhat disruptive to procurement staff at Bayshore. It took some time to get the procurement staff onside with the innovation partnership model. Anita Fitches, Bayshore's Director of Integrated Care Solutions reflects, "It's really taken some time to get our organization around the fact that we're actually doing some innovation and we're doing these new things. [...] I would say that although it hasn't been a hard push back or anything like that, they don't necessarily understand the area that well because they haven't worked in it."

Success factors

The procurement and promising early results of this work were supported by several strategies that enhanced the chance of success. The co-design approach is working for them, and at this stage, the innovation partnership between Bayshore-KHSC-Verto has met two of the four original co-design objectives. They have successfully reduced the stress associated with TCU transfer and stays, and have started to scale the model. As the full functionality of RightPath is activated, it is expected that the other co-design objectives will also be achieved. The following five influences are the primary factors that contributed to the success of the innovation partnership approach.

1. Time on site

Verto spent a lot of time on site in Kingston. Verto's team is based in Toronto and they made six trips to Kingston throughout the co-design process. They spent time understanding the flow from KHSC to the TCU from the patient's point of view and gathered input from clinicians and managers at KHSC and the TCU. Verto had open access to patients and caregivers. Bayshore was well positioned to provide input and ideas for the clinical part of the solution, but for the patient and caregiver component, there was a lot of uncertainty because this was entirely new for everyone involved. Bayshore and Verto had made several assumptions about what would work best for patients and caregivers, and if the solution had been built on these premises, it would have been flawed. Instead, the interactions with patients and caregivers helped to refine what worked and what didn't. Verto had previously done personas work, and the IPPCD experience took this a step further with more extensive in-person research with a diversity of patients and caregivers.

2. Frequent communication

Bayshore and Verto took the time for frequent communication and interaction. The relationship was open, flexible and trusted. Bayshore and KHSC appreciated how Verto would listen to how they operate, quickly understand their needs and be able to implement them in a very timely manner.

3. Open to adaptation

Verto came in with two functional applications. They were open to customizing this functionality for this challenge. They weren't starting from the ground up, but at the same time they weren't forcing the adoption of features and structures that turned out to be the wrong fit for this challenge. Having an existing technology asset gave them a head start in some respects, but it was ultimately their ability to substantively pivot from that into a different solution that was crucial to the success of RightPath.

4. Clarity of objective

Bayshore and KHSC were clear in what they wanted, which helped them be focused in what they were asking for from Verto. Having Bayshore as a partner was helpful for KHSC to flesh out this clarity. This gave Verto a "North Star", and rather than spend time trying to figure out the underlying motivation for the solution, Verto and Bayshore could hone in on solving the problem. Anita Fitches noted that this was about,

"Being very clear about your goals and where you want to go, and I think that was really big for us with Verto." The key people involved from Bayshore were very knowledgeable in their clinical practice, and were focused on improving patient outcomes. This helped Verto to better understand how technology might address their challenge. Anita also reflected, "I think the other success factor is that you have to have people in your team that understand what you're trying to do. Bringing in the right people to work on this project and that's what we did in Bayshore."

5. Understanding the market

Bayshore invested in doing market research in the lead up to IPPCD. This helped to make the case internally for investing in the Verto solution. It was clear that they needed a solution, and there wasn't anything available on the market that was suitable.

Scaling

Bayshore is interested in spreading their ALC program. They see RightPath as a competitive advantage that will support this objective. The Kingston ALC unit is planning on moving to a new site that will likely result in more bed capacity, and this move is expected to make the advantages of using RightPath even greater. This is an immediate scaling of capacity that benefits KHSC, and more Bayshore is also in the process of contracting Verto for the use of RightPath in a Bayshore facility in North Simcoe.

The partnership with Bayshore is beneficial to Verto as a small technology vendor. As Bayshore looks to expand, Verto can support them in their marketing efforts as they look to move the program into other places. This saves some of the effort and investment needed for Bayshore to penetrate into new markets and get on the radar of potential clients. In being the technology that backs Bayshore's ALC goals, Verto is naturally aligned with a larger organization with a similar ambition.

The lessons from the Bayshore project have helped Verto to revamp their business model and inspired the creation of their current architecture which has allowed them to tackle more complex and varied

healthcare challenges. In addition to Bayshore, Verto has sold their solution to CAREpath and St. Michael's Hospital. They are also working with several strong leads, some of which could expand their activity into the U.S.A. Verto was selected to be part of a pitch competition at NYC Corridor Day with Communitech.

The greater potential of the RightPath solution is the efficiencies that will come when a large number of hospitals, transition care units, and other healthcare supports are connected within the same platform. A profile of a patient and their needs can be matched in an optimized way with the available healthcare and community resources. In the current situation, there are already efficiencies with one hospital and one TCU with a 10 bed capacity. In a scenario with more beds and multiple hospitals, the potential efficiencies increase greatly. Across a LHIN resources could be allocated more strategically using a queue management function that is part of the RightPath solution. ALC patients can be put into queues that use an algorithm to expedite their transfer to any clinic that might have capacity and match their patient requirements within a set range. For example, there might not be any nursing units with accessibility supports, but if the issue is mental health support, there might be other care options in the system that can meet those patient needs. The software would personalize the triaging of these patients to the correct environment and care pathway.

Conclusions: Innovation for Efficiency

To date, RightPath has provided efficiencies for clinical and managerial staff at the Kingston TCU. The effectiveness objectives have not yet fully rolled out (for KHSC, and for caregivers), but it looks promising that they will come in time as the full functionality of the solution is implemented. The potential for more is very promising. Integration with KHSC and patient and caregiver access, are expected to provide additional benefits to patients and to the flow of patients from acute care into the TCU. If the RightPath solution scales significantly across healthcare institutions within a region, the system level efficiencies could be transformational.

This initiative got off to a rough start in IPPCD. The problem wasn't well understood, and there were questions about the practicality of completing a solution within the program's timelines. Not getting the initial IPPCD funding was a setback, but not a deal breaker. The ability of the KHSC-Bayshore-Verto collaboration to find focus, clarity, and ultimately, a solution, is a testament to the potential of co-design, and how difficult it is to pick winners at an early stage.

Central to their success is the capacity to change. Verto had to pivot the concept of their platform quite substantively. New ways of understanding and framing the problem are at the heart of innovation. The insights that Verto was able to get from high engagement with clinicians, patients and caregivers enabled Verto to figure out that a solution needed to be more than a patient portal that looks in. It needed to be a patient engagement approach that changes based on where a patient is at in their journey. This transformed RightPath, and the result is a new model for Verto's technology.

Through the partnership of KHSC, Bayshore and Verto, we see a case where the benefits of co-design, and in particular, strong end user engagement, are a

clear advantage. These benefits helped the partners to shift from a slow start to a strong finish.

The RightPath case is both low complexity and high complexity. It is low complexity in that the introduction of the solution in the early days of another experiment – in this case the new TCU – limited the amount of un-learning and process change necessary. There was little disruption and the solution was easy to adopt. Furthermore, the solution itself, from a user perspective, is simple and straightforward. On the other hand, the RightPath solution is high complexity in its potential as a scaled solution. The healthcare efficiencies that could come from a broad adoption of the solution are potentially massive. This is because the solution needed – optimizing the use of existing assets, whether they be community programs or acute care beds for example, is exactly the kind of thing that technology is good at figuring out. Perhaps this is a sweet spot for innovation procurements.

