

Innovation Procurement at Markham Stouffville Hospital

By Jamie Gamble



Procurement by Co-Design

Procurement by Co-Design is a novel innovation procurement approach designed, developed and delivered by MaRS Solutions Lab. The program enables the public sector to partner with innovative technology and service vendors to collaboratively create impactful solutions to pressing challenges. Taking a co-design approach, innovation teams engage key stakeholders, including end users, to rapidly learn from small-scale experimentation and iteration. Teams then conduct an outcome-based evaluation of the solution before making the final procurement decision.

To learn more about Procurement by Co-Design, please visit www.marsdd.com/systems-change/procurement-co-design or contact us at designchallenge@marsdd.com.

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Imprint Consulting

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Ignite: A solution for onboarding new physicians

The first couple of weeks of July are always very busy at hospitals. July 1 is what is known as a turn-around day. New resident physicians start to come on board, new graduates are certified as doctors and many employment openings are posted to coincide with this timing. As a result, a massive intake occurs in the first weeks of July.

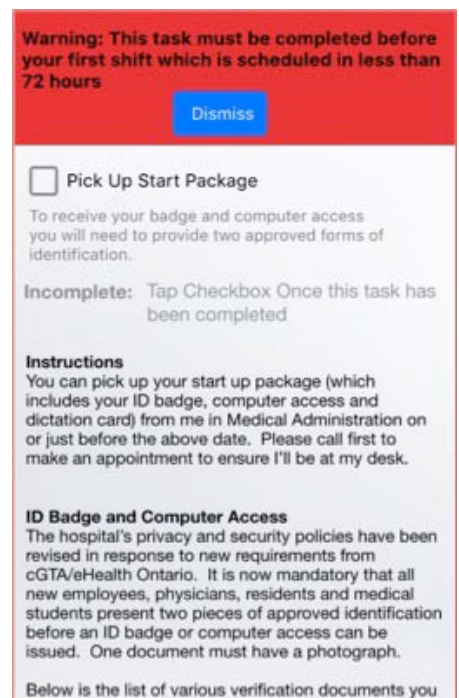
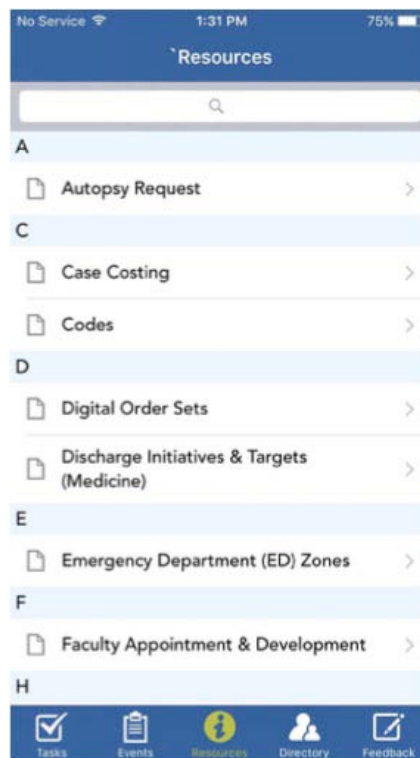
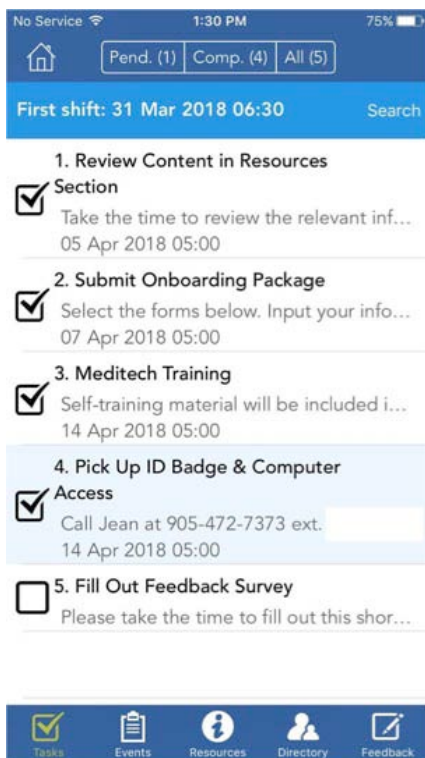
Orienting new residents or doctors involves a flurry of activity that intensifies in the 48 hours before they officially start. Even with all the demands of a busy hospital environment, new physicians are expected to hit the ground running. Before they can do so, there are various agreements to sign, hospital policies to learn and questions to answer, from “Where do I park?” to “How do I contact another doctor?” to “How do I log in to access lab results?”

Markham Stouffville Hospital (MSH) noticed that the paper-based process it used to onboard new

residents and doctors was very cumbersome and time consuming. Further, because MSH tends to hire a lot of locums, or temporary workers, doctors need to be able to quickly adapt to systems that are often completely different from hospital to hospital.

MSH brought this challenge to the first cohort of MaRS Innovation Partnership: Procurement by Co-Design, a unique program that enables healthcare service providers to participate in the development of innovative solutions. The hospital framed its challenge in the following terms: “We are seeking a solution that would allow for physicians to be onboarded, access vital hospital information, complete required documentation, review leadership structure remotely to address these areas, increase knowledge transfer and help foster the relationship between physicians and administration.”

In partnering with VitalHub, a Toronto-based software company that develops healthcare information systems, and using a co-design process, MSH developed Ignite, a smartphone application that makes the doctor and resident onboarding process simpler, more efficient and more effective.



While the main goal was to make the physician onboarding process more efficient, the initiative was also seen as a way to strengthen the hospital's engagement and communication with its physicians.

Recruiting physicians is a competitive process. In solving the onboarding problem with Ignite, MSH realized that the app also had the potential to facilitate communication channels between physicians and the organization. It provided the tools needed for better physician engagement, helping with problem identification and resolution, and ultimately with physician retention.

Ignite was developed with the following specific outcome-based specifications.

Short-term targets

- App usage (target: 75% of select professional staff segment complete onboarding and orientation with the app)
- User experience (target: 20% increase in “satisfied” and “very satisfied” survey responses)

Long-term targets

- App effectiveness (target: 75% of material completed before first shift)
- Medical administration experience (target: 75% satisfied with new onboarding/orientation process)
- Continued use (target: 20% continued use post-onboarding/orientation)

The app was co-developed by MSH and VitalHub, who collaborated under a novel procurement strategy called an innovation partnership. Innovation partnerships enable healthcare service providers to participate in the development of innovative solutions before procuring them. In turn, technology and service innovators with scalable business models gain unprecedented access to end users and are able to validate use cases, enabling them to remain competitive.

MSH and VitalHub were supported in their innovation partnership through **Innovation Partnership: Procurement by Co-Design (IPPCD)**, a program offered at MaRS. The

initiative offers healthcare service providers the opportunity to collaborate with vendors in the development of innovative solutions that address the complex problems they face while also complying with the Broader Public Sector Procurement Directive.

Forging ahead despite setbacks

There were significant delays in the development process for Ignite and, as a result, the testing of the app took much longer than originally anticipated. The timing of these delays had a snowball effect—in slowing down for a couple months, the project wound up being delayed for the better part of a year.

Prototyping and fidelity with clinicians

The development process took longer than anticipated because MSH wanted to have all of Ignite's features activated before it was tested with physicians. MSH worried that if only some of the app's features could be tested, new staff would still have to complete certain aspects of the onboarding process on paper, which would make the process even more frustrating. The concern was that testing of an incomplete application would result in reduced buy in, while not fully assessing the solution. As a result, it took longer than expected for VitalHub to complete the initial build of the app.

“It was important to get it good first. If there wasn't enough functionality we wouldn't actually be testing something because half of the process would have still been on paper and cumbersome in the same old way.”

Dr. George Arnold, chief of innovation and strategic ventures, Markham Stouffville Hospital

MSH started with tighter specifications for its solution than is usually the case in an innovation partnership. The team knew exactly what it wanted in an app: tasks, checklists and content, all made available through a mobile device. A few upgrades from the original concept, like a physician directory, were added along the way.

Timing in project management

A change in key personnel partway through the project meant that it lost its primary champion at a key moment. Although the hospital remained committed to the project, momentum and focus were reduced, resulting in delays.

Because of the delays, it wasn't possible to test Ignite for the onboarding of the large wave of new physicians starting in July 2017. That window of opportunity came and went, and it was fall before the app was ready to be tested. Unfortunately, there were only three opportunities between fall and spring when a new physician required onboarding and could test the application.

One year later, the testing of Ignite is moving forward with renewed focus. The hospital is now including residents in the Ignite onboarding process, and VitalHub was contracted to add this functionality to the app. With residents now included, and the expected wave of physicians who will be onboarded over the summer, a more robust test of Ignite is expected.

In the long term, even more features are desired—including scheduling and secure messaging between physicians—but for now the goal is to get the application in use with its current functionality.

In June and July 2018, 20 new physicians and residents onboarded using Ignite (60% of all new physicians and residents). When asked to rate MSH Ignite on a scale of 1 to 10, respondents' gave an average score of 8. When asked whether they would recommend the app to other newly appointed physicians they had favourable comments, including: "Perfect amount of resources" and "Made onboarding so much easier—excellent app!"

MSH and VitalHub are now working on an Android version of Ignite (the app is currently only available for iOS). Once it is ready, they will assess Ignite against the original outcome-based specifications. There is growing interest from medical students, residents, volunteers, and the entire physician group in adopting Ignite. There has also been discussion about eventually using Ignite to onboard all clinical and non-clinical staff. MSH is mapping out requirements and exploring the feasibility, and plans to begin to spread to these areas in 2019.

In the MSH case, innovation is about applying current technology to an existing process with the goal of making it more efficient. An onboarding process that used to take four or five hours can now be done in one or two with the Ignite app. The IPPCD program enabled the development of a solution tailored to MSH's unique challenges, needs and existing operations. Core business processes will remain largely intact, and thus the scope of change is less disruptive.

What this case examines

The MSH case explores innovation procurements by:

- Highlighting six key elements of an innovation partnership model
 1. Linking innovation procurement with organizational strategy
 2. Strategic partnership selection
 3. Risk sharing
 4. Outcome-based specifications
 5. Contextually relevant solutions through co-design
 6. Prototyping and testing
- Examining how these elements can be applied to projects of different scopes by looking at three examples from MSH
- Summarizing the lessons learned about innovation partnerships from MSH's experiences to date

The IPPCD program

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 deal with the risks of introducing innovation in a complex healthcare setting. The teams are supported with hands-on co-design 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.

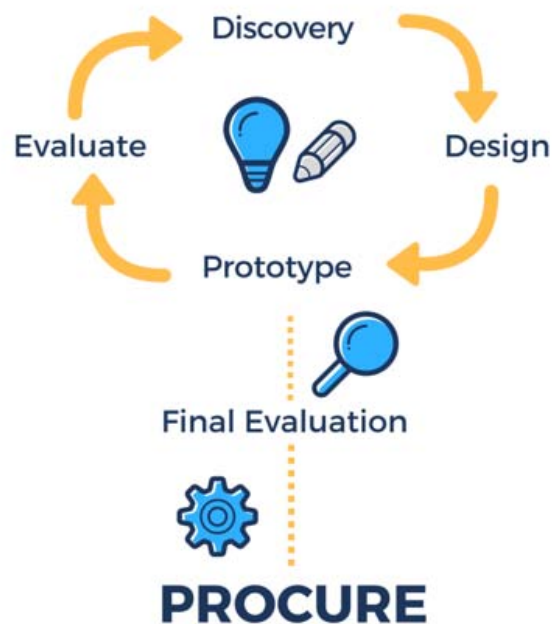
With IPPCD, MaRS engaged healthcare procurement experts, care delivery organizations and the technology venture community to create a process for new forms of collaborative value creation.

MaRS helped 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;



DESIGN & PROTOTYPE



- 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.

Application of innovation partnerships to three innovation projects

6 key elements of an innovation partnership model

1. Linking innovation procurement with organizational strategy

Innovation is a strategic priority for MSH and is seen as essential for improving the patient experience and the care that staff and physicians provide. Prior to participating in the IPPCD program, MSH had already created an innovation unit. This unit—now called the Transformation Office—manages a portfolio of activities that includes business development and problem solving by applying a range of methodologies including lean, quality improvement and design thinking. The Transformation Office now includes five project managers and is an essential part of the hospital's strategic initiatives.

The Transformation Office exists to support the hospital's strategic plan and has a mandate to solve

tough challenges with permission to pursue alternative—and potentially more disruptive—ideas. The unit works closest with the hospital's Quality Improvement Department, although it is seeing increasing interest from all departments who have been coming forward with challenges that they would like to work on. When the innovation team at MSH was first formed, it received a lot of requests to procure pre-determined products or services. The team is now starting to see a shift and their colleagues are now more likely to come forward with a problem and a request to find an appropriate solution. Staff are gradually becoming more familiar with design thinking and three new initiatives using the innovation partnership approach are underway as a result.

MSH is open to taking risks and wants to work with vendors who share a vision for innovation. For the hospital, the primary draw of innovation partnerships is the ability to co-develop solutions with vendors. MSH previously ran into challenges where it had piloted an idea that benefited the hospital, but then needed to return to a request-for-proposal (RFP) process to actually procure the solution. The RFP process takes time—sometimes even stalling a project—and may ultimately result in a solution that is different from what the healthcare provider intended to procure in the first place.



Smart Hospital initiative

MSH has various independent systems that manage departments and hospital functions. A new initiative, Co-Designing a Smart Hospital to Improve Patient and Information Flow, aims to integrate these systems in a smart hospital model. The solution would include functionalities such as bed management, call bell integration and asset tracking. Ideally, the solution will require minimal additions to the hospital's current infrastructure.

Green Innovation initiative

Operating room fans are expensive to operate and, because they are always running, optimizing their use could result in significant energy and money savings. Managing the fans is not as straightforward as simply turning them on and off. They take time to cycle up and having them running properly is critical to patient and staff safety. A successful on-demand solution could maximize efficiency across the hospital for operating rooms, as well as for kitchen ventilation and lighting. It would also enable energy usage to align with patient-care needs, thus reducing electricity, gas and water usage.

Instead of an innovation partnership, MSH has put out a request for expressions of interest using an innovation-friendly competitive model.

Administrative Rounds initiative

MSH's third innovation partnership initiative is the desire for a solution that tracks the actions that come out of patient rounds done by hospital administrators. MSH has a practice of leadership and staff regularly engaging with patients and asking them questions about their experience, their care plans and what could be improved. These rounds often generate immediate issues that require resolution, as well as insights that can inform future strategies. MSH wants to better track and manage the responses to the issues identified in these rounds.

These three projects differ widely in scope and complexity. The smart hospital initiative is a very large and complex information technology project and will likely involve an initial investment of approximately \$1 million. The administrative rounds tracking initiative should be a relatively

small project that will likely involve a simple tool that will cost around \$20,000 to procure. The green innovation initiative will require a \$600,000 investment. To date, MSH has invested \$20,000 in the development of the Ignite app, in addition to the grant money it received from the IPPCD program. As the scope of investment increases, so does the extent of staff and/or physician engagement in the design process, as well as engagement with the vendor market.

An innovation-friendly competitive process (IFCP) draws upon many of the same features as an innovation partnership. MSH issued a request for expression of interest (RFEI) to engage vendors upfront, surface questions and generate interest for a request for proposal (RFP). Vendors were asked to submit answers to a series of questions, including: Are there emerging technologies in this field that we should be aware of? What challenges do you foresee with this project? Would you apply for the RFP?

As with an innovation partnership, MSH expects to pay the vendor some fees upfront, some upon installation and some after testing (prior to full-scale procurement).

In an innovation partnership, the innovation lies in both the product (bringing something new to market or significantly changing something that is already available) and the procurement (partnering with the successful proponent to design/build a solution). With an IFCP there is less product innovation, as it is more about leveraging already-existing innovative technologies. The procurement innovation lies in the fact that the healthcare provider keeps an open mind about how they can solve the challenge. The provider knows the outcome they are looking to achieve and uses outcome-based specifications and value-based evaluation criteria to score and select the successful proponent, but does not assume they know the best way to solve the challenge.

2. Strategic partnership selection

After its experience with the Ignite project, the criteria for partnership selection and formation

became much clearer to the MSH team. MSH has since been using the contract language from the IPPCD program for its innovation partnerships. The hospital is focused on finding partners who are able to fully grasp the nature of its problem and who are interested in exploring a possible solution rather than trying to sell MSH on an existing product. What MSH has found most critical in a partnership is a willingness to learn and the openness to not have preconceived assumptions about how something should work. Its ideal vendor is flexible, yet willing to stick through the messy process of exploration.

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3. Risk sharing

One of the risks of innovation partnerships is the time and effort required for a more iterative co-design process. Both the vendors and the healthcare provider risk investing time and effort into an initiative that may not pan out.

With Ignite, the IPPCD program mitigated some of the risk through funding and a structured process. MSH's Transformation Office prioritizes innovation initiatives that have external funding for this reason and, because healthcare operates in a very tight fiscal market, there tend to be restrictions on how to spend for innovation. When the development process is more drawn out than originally intended, it puts more burden on the vendor. In the Ignite example, VitalHub wound up shouldering more risk.

MSH and VitalHub agreed to a trial license for Ignite's testing period. This provided the vendor with some modest investment, without requiring full procurement until the outcome-based specifications were validated. Additionally, MSH and VitalHub viewed the intellectual property as a co-development. MSH will receive a base percentage on any future sales and a bonus if it acts as a referral site. For MSH, benefiting from future sales of its solution is about the principle of valuing their investment of time and resources into the development process.

These different models of risk- and gain-sharing are informing the procurement process for the Smart Hospital and Green Innovation initiatives. One of the criteria for vendor selection is the vendors' approach and interest in alternative risk- and revenue-sharing models.

4. Outcome-based specifications

MSH will use outcome-based specifications as part of its agreements with the successful vendors. A commitment to procure a solution if specific targets are met in the testing phase will also be included in the agreements. The Smart Hospital project is posted on the Ontario Tenders Portal and the Administrative Rounds project is posted on Colleaga.org and the MSH website. The postings include a challenge brief that outlines the nature of the problem and provide high-level guidance on what MSH seeks in a solution.

The Smart Hospital initiative has the following objectives.

- The solution automates processes that capture and share data related to patient, equipment and information flow in a way that promotes ease of use with minimal manual intervention.
- The solution enhances safety and security. The solution should provide staff with a reliable tool that reduces the likelihood of errors related to patient safety within an information technology system that cannot be compromised.

- The solution generates reports and data that can be used to drive further improvement.
- The solution integrates current services/infrastructure and additional services into one platform to reduce the total cost of ownership.

The procurement of the Smart Hospital solution will be assessed based on the following measures:

- decreased time from decision to admit in emergency department to patient in bed on unit;
- decreased length of stay;
- improved nurse call bell answer times;
- improved patient satisfaction;
- decreased patient wait time;
- improved staff satisfaction;
- reduced cost per weighted case;
- improved utilization of capital equipment; and
- appropriate utilization of human resources.

MSH has been pleased with the responses from vendors to all three of its innovation partnership projects. The innovation-friendly approach has allowed for more engagement with MSH’s vendor community and a greater understanding of the problem it is trying to address (both internally and within the vendor community). The expectation is that this should lead to better partnerships.

MSH has observed that there is still not a high degree of exposure to innovation partnerships and vendors need certain expectations to be clearly outlined. For example, potential vendors usually inquire about the intentions for intellectual property, as well whether early market engagement strategies will be scored and evaluated.

5. Contextually relevant solutions through co-design

MSH is interested in solutions that are customized to its unique needs and challenges. While there are often elements of a solution available in the marketplace, off-the-shelf solutions are usually an imperfect fit. The hospital interprets and applies co-design as an iterative engagement with a

Markham Stouffville Hospital

Markham Stouffville Hospital is a community hospital located in Markham, Ontario. It employs 450 physicians, 2,100 staff and 1,300 volunteers. Hospital services include diagnostic, emergency and clinical programs in acute care medicine, addiction and mental health programs, and childbirth and children’s services.

VitalHub

VitalHub Corp. is a Toronto-based software company developing IT mobile solutions for healthcare organizations. VitalHub’s platform includes apps for clinical care and communication, with a focus on the mental health and long-term care spaces. VitalHub was founded in 2010 and acquired by a group of private investors in 2016 with the objective of building new solutions off the original platform. VitalHub is publicly traded on the TSX Venture Exchange.



vendor in a way that involves patients and hospital staff in the customization of a solution. Rather than work with tradeoffs, the innovation partnership helps MSH to get something that is very tailored to its needs.

At the same time, the needs that a tailored solution responds to are often shared by other healthcare providers. For vendors, the appeal of the innovation partnership is that they can develop a tailored solution and, in turn, apply what they learn to more scalable solutions. For example, VitalHub has already seen interest in the Ignite app from other hospitals.

6. Prototyping and testing

MSH intends to prototype, test and evaluate solutions for these three new projects as they develop. None of the new initiatives are at the prototyping stage yet.

Lessons for innovation partnerships

The challenges MSH faced in moving Ignite’s testing phase forward reveal some common hurdles that organizations may face in innovation partnerships. In addition, the development of a transformation unit within a large healthcare institution—and how it has been working to expand the hospital’s use of innovation partnerships—offers lessons and insights into the advantages and challenges of innovation partnerships.

1. Building a resilient innovation team

Staffing changes at MSH led to the loss of an internal champion at a critical time. This is common in highly innovative initiatives. Often, there tends to be general buy in and support of the initiative at the executive level, but the in-depth understanding of the responsibilities and expectations of prototyping and user engagement are not necessarily there, which can affect the ability to keep an initiative moving in the face of challenges. If key dates are missed, it is important for innovation teams to consider contingencies and how to sustain momentum.

MSH learned a lot from its experience developing Ignite and is pursuing its next cycle of innovation partnerships with what it hopes is a more resilient approach. The hospital has contracted an external expert on innovation procurement to do some training with its executive team. MSH has also built a more robust steering committee so that ownership and championing of the initiative is better distributed. The committee includes MSH decision-makers, as well as the project funders, with the expectation that this group can more effectively resolve any issues that may emerge. The committee is separate from the design team, which includes the subject matter experts whose responsibility it is to work through the co-design process with the vendor.

2. Iterative prototyping in a healthcare context

MSH saw the need for physician buy in as critical—however, the idea of rapid, iterative cycles with low-fidelity prototypes is central to the design-thinking process. VitalHub had pushed for testing Ignite sooner, while the app had only partial functionality, as rapid feedback generally generates useful insights that can inform the final development. However, for MSH there seemed to be an expectation that providing feedback on something of lower fidelity than an interactive digital mock-up was a waste of time for its clinicians.

It may be that innovation teams need better guidance and skills in prototyping and evaluation frameworks in order to figure out how to set the expectations of their testers and to determine what level of fidelity prototype is adequate for what they are trying to learn.

When it comes to physicians, compensation should also be considered, as they are not employed by hospitals and work as independent contractors. Is there a model where physicians who provide input or are part of the innovation process could be paid by the hospital?

Alternatively, hospitals could set the expectations for companies wishing to take this approach. If healthcare providers developed in-house capabilities to rapidly create interactive digital mockups that allowed for more efficient user testing as part of the product development process, they could be a draw for vendors and make the development process easier.

3. Adapting the partnership and co-design process to procurement value

MSH’s choice to wait for full functionality before testing Ignite—as well as the range of initiatives that are now using innovation partnerships—reveal some insights into different kinds of innovation and raise questions about what sort of problems are best suited for full-scale innovation partnerships using co-design.

Even though MSH's projects are diverse in size and scope—and in the type of challenge they are addressing—the hospital is choosing to apply co-design and innovation partnerships to their development and procurement. Innovation partnerships take significant resources to develop. They can add months to a procurement process, as there is more upfront work and the transaction costs for partnering are higher (i.e. more meetings). Further, while the involvement of users in the development and testing is invaluable in validating the desirability of a solution before more significant investments are made, it also adds a burden.

Ignite is a practical solution to a challenge that MSH wanted to solve. Moreover, the development of Ignite introduced a procurement strategy that has since become an integral part of the overall innovation portfolio at the hospital.

It may be the case that alternative design approaches may be better suited to smaller scale initiatives (like MSH's Administrative Rounds project) and projects where less iteration is expected (like Ignite). Is there a solution that enables the procurement advantages of an innovation partnership but requires less input and management? (One example would be a design sprint, a five-stage, time-constrained process that incorporates design thinking.)

There are tremendous benefits to procuring solutions that are tailored to a specific context. What is the suite of innovation procurement tools

that would allow for problems of differing scopes and anticipated level of disruption?

4. Innovation partnerships as leverage

MSH has found that innovation partnerships—particularly the commitment to procure pending successful evaluation of outcome-based specifications—are an effective way to increase its negotiating leverage. In a more traditional RFP process, when a solution is piloted and found to be successful, the healthcare provider's negotiating power is minimized because it is locked into a tailor-made solution, but the terms and conditions of procurement are not yet in place and require further negotiation.

By working out the terms and conditions for procurement as part of the co-design process—as well as terms for commercialization and revenue sharing—the healthcare provider is better positioned if the innovative initiative does not work out.

5. The sustainability of innovation

A challenge for MSH going forward will be finding a way to ensure that innovation is institutionally sustainable in the long term. Currently, the hospital is very successful in attracting granting resources to support its innovation projects. The Transformation Office at MSH has sourced over \$2 million for innovation projects since the team's inception and, to date, it has been essential to have external grants for any innovation project to move forward.

The premise of many funding programs is to demonstrate the inherent value of investing in innovation. How do institutions like MSH, whose current model is reliant on external funding, build the long-term resources for investing in innovation? For example, could it build an innovation fund through the revenue-sharing agreements that are part of these early innovation partnerships? What kind of case is needed internally to support self-funded innovation initiatives, including innovation partnerships?

Innovation partnerships and an innovation portfolio

Ignite is a practical solution to a challenge that MSH wanted to solve. Moreover, the development of Ignite introduced a procurement strategy that has since become an integral part of the overall innovation portfolio at the hospital.

MSH has embraced innovation partnerships. Its experience with Ignite—and the projects that have followed—showcases the potential of the approach. Ignite illustrates the investment of time and effort required for an innovation partnership: time and effort that can compound greatly when challenges like delays occur.

At the same time, the time and effort pay off. Ignite is a solution that is contextually relevant to MSH's needs—and because it addresses a challenge that many hospitals face, it is a solution that is likely to be scaled.

MSH is an exemplary case of an organization that is committed to innovation. It is taking steps to systematize innovation and, in doing so, is revealing the challenges of innovation partnerships and learning valuable lessons.

MSH has learned how to make the project management of an innovation partnership more resilient, and its experience with Ignite raises important questions about the appropriate level and timing of iteration in a healthcare context. More will be learned as the current suite of innovation partnerships play out over the next year. As that happens, we will continue to learn from MSH about what it takes to build and sustain an innovation unit in a healthcare setting.