Enterprise Innovation

The Current Landscape of Innovation in the
Canadian Healthcare System

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Health care for women | REVOLUTIONIZED

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Executive Summary

In the rapidly evolving field of healthcare delivery, organizations are faced with challenges as they navigate using traditional enterprise models for innovation solutions paired with clinical innovations. The payoffs for coupling enterprise and clinical innovation to create a solution that makes a scalable and lasting impact are great, as technology has become an increasingly important component of healthcare delivery, one that can improve patient care and outcomes.

Enterprise innovation is the practice of identifying significant, positive change and introducing it in the enterprise environment. Organizations are now shifting away from traditional definitions and models for recognizing and advancing innovation within their own enterprise and starting to tackle the concept of enterprise innovation on multiple levels. New missions, goals, and barriers exist within organizations today, and, with innovation no longer being limited to individual entities, an opportunity exists to create and maintain varying partnerships of like-minded people.

The CHIEF Enterprise Innovation Executive Forum Working Group has come together to define what innovation encompasses, present the current Canadian landscape for enterprise innovation, and identify the factors that promote successful innovation and the barriers that impede enterprise innovation. The paper will set out to provide research that supports new concepts within the field of enterprise innovation in healthcare, in the hopes that organizations that tackle these complex issues will be well equipped to spearhead change and bring innovation to the forefront.

> Enterprise innovation is the practice of identifying significant, positive change and introducing it in the enterprise environment.

Introduction

Across Canada, government and healthcare organizations are encountering increased rates of chronic disease, aging populations, and patients and families facing difficulties accessing health information with limited engagement in their care.[1] In this environment, promoting enterprise innovation presents an opportunity for leaders to transform the health system, ensuring care is patient- and family-centred, accessible, efficient, and effective.

Healthcare innovation is a popular topic in Canada. The term innovation has been commonly used across subject lines, reports, conferences, articles, speeches, and papers.[2] Today, innovation within healthcare can be commonly associated with the introduction of technology such as the electronic medical record and/or assistive devices. However, innovation is not limited to technology, and to truly transform our health system, the definition of innovation should broaden to include business model innovation, new service/care models, and promotion of self-care—all augmented with the use of technology. This can include how services are delivered, as well as new payment models, and communication and collaboration tools. Within healthcare, there are three general areas where innovation can be incorporated to drive improvements: patient care delivery, selection and integration of technology, and business models that support the healthcare system.[3]

The concept of innovation has been applied and defined in many ways. It is essential for organizations to identify a definition for innovation and its key themes in order to collectively establish a common ground on what innovation is and is not.[4]

One single definition for innovation does not exist. To summarize, the following are a handful of definitions and common themes:

1

Innovation can be big or small

- Innovation can be a small change that simplifies everyday tasks, or it can be a big change that completely transforms the way we do something.[5]
- Innovation is something that adds value and provides a significant incremental (or more likely transformative) benefit over the current status quo (or standard of care, in the context of health).[6]

2

Innovation should be impactful and add value

- Innovation is new or better ways of doing valued things. An invention is not an innovation until it has been implemented to a meaningful extent. Innovating is not limited to products but includes improved processes and new forms of business organization.[6]
- Innovation is the process of creating value by applying novel solutions to meaningful problems (Appendix B)

3

Innovation should not only revolve around technology

- Innovation denotes new, better, more effective ways of solving problems. Adopted from the business, technology, and marketing industries, the term has been used to describe policies, systems, technologies, ideas, services, and products that provide solutions to existing healthcare problems.[7]

Health delivery organizations face challenges as they drive forward with digital transformation of the traditional enterprise model and integration of entrepreneurial care delivery models and clinical innovations. This paper will address the current landscape of innovation in the Canadian healthcare system and the barriers that prevent enterprise innovation. The paper will also elaborate on a framework for the factors that promote successful enterprise innovation within an organization.

Barriers to Enterprise Innovation

Aversion to Risk

A risk-averse procurement culture values short-term investment and cost-containment over broader, long-term investment that may lead to the continual improvement of health outcomes.[8] The strong prioritization of patient safety is vitally important but should not impede Canada's innovation endeavors. Procurement processes that are constrained by strict regulations, as well as lack of flexibility and shortage of procurement skill sets must be mitigated in order for innovation to progress.[9]

Balancing Operations with Innovation

The operation nature of healthcare makes it difficult to build innovation within an enterprise's policies, budget and workforce. Leaders face the challenge of executing daily operations efficiently and cost-effectively, while also pursuing innovation and future growth.[10] Without a culture shift towards transforming health, healthcare organizations are unable to change current funding and service models, organizational visions, and strategies. It was noted during the CHIEF Executive Forum 'Enterprise Innovation' Working Group (the 'Working Group') discussion that the pace of change within the healthcare industry is constant and often rapid, and that organizations are often forced to move forward at a pace that they are not always comfortable with.

Change Management

Organizations may not have the capacity to commit to effective change management strategies to ensure smooth transitions while also balancing operational needs. Lack of experienced change leaders compounded with a workforce resistant to change may pose challenges to an organization that is attempting to undergo an innovative venture.[11]

Siloed System

The Canadian healthcare environment is comprised of a collection of siloed systems that lack coordination, cooperation, and interoperability.[10] These siloed systems include provincial/territorial health systems and public/private sectors, in addition to those across and within organizations such as budgetary silos.[12] The result is a system in which innovation cannot be shared or widely adopted, with an increased likelihood of wasting resources due to duplication.[10] The Working Group noted that multiple stakeholders and jurisdictions can often result in conflicting visions and agendas that impede moving forward together for system-level transformation. Challenges

inherent in Canada's siloed system are exacerbated by an absence of national health innovation policies and regulation for health innovation.[13] Innovation is being pursued without substantive collaboration or sharing of information across governing bodies, resulting in a convoluted process for innovators who seek to scale-up innovation across the country.[13] Innovation is being pursued without substantive collaboration or sharing of information across governing bodies. Overall, these numerous silos have produced convoluted processes for innovators who seek to scale up their innovation across the country.[13]

Pilot Culture

Some entrepreneurs have identified the siloed Canadian healthcare ecosystem as the place where "pilot projects come to die.[10] The Working Group recognizes that the reason that pilot projects cannot be steadily supported is often due to a lack of both resources and ongoing funding. It is important that infrastructure for innovation and future funding models be in place prior to beginning a pilot project to ensure continuity

Privacy and Data Security Concerns

Concerns regarding privacy and data security, including the lack of harmonization among federal and provincial/territorial frameworks, often impede rather than empower innovation. As the volume of digitized and stored health data accumulates at an exponential rate, organizations are struggling to strike a balance between concerns regarding privacy and data security and the fast-growing Open Data movement.[12] The Working Group identified 'vendor lock' as a specific obstacle in this area, as some vendors may monopolize organizations through contract clauses preventing interoperability and data sharing with other vendors within the same organization or across organizations. In contrast, consider the successful example of the newly-created Health Data Lab at the Newfoundland Centre for Health Information (NLCHI). The Health Data Lab is driving innovation that will benefit health system users, researchers and innovators by granting multiple stakeholders secure access to health data.

The Enterprise Innovation Working Group has identified a checklist for organizations to help address these barriers as they forge ahead enterprise wide innovation programs. (Appendix A).

Vendor Lock: An obstacle to interoperability and data sharing

Future State:
How Do We Drive Innovation?

Ecosystems of Innovation

An ecosystem of innovation is an approach by which the creation of multidisciplinary collaborations and long-term partnerships between companies of varying expertise occurs in a clustered method. These innovative partnerships share provisions of resources, knowledge, and mentoring to bring new ideas to the market through communication, collaboration, and acceleration. Pilot Culture, one of the innovation barriers discussed here, shows that up to 90% of Ontario healthcare startups fail in part because they cannot break through the barrier to access to the healthcare system while developing their product.[14] Ecosystems of innovation may enable companies and developers to come together to take projects throughout their complete lifecycle, and introduce the projects into the sector.

When looking at the methods by which enterprise innovation can take form, it is important to first look at real use case examples of these innovative partnerships in the healthcare sector right now (Appendix D).

Organizations such as SE Health, Southlake's CreateIT Now, Innovation Boulevard, Hamilton Health Sciences: Synapse Life Science Consortium, Hacking Health, and Newfoundland Centre for Health Information are all examples of multidisciplinary partners coming together to complete innovative and far-reaching projects.[15] By creating ecosystems that align strategic goals and visions, organizations are better able to tackle the complex problems in healthcare and make an impact beyond their original scope.

The process of creating external partnerships may be difficult for some organizations and there are a few key aspects to consider when doing so. Ecosystems of innovation may be especially valuable for smaller organizations that lack the scale and resources to introduce innovation but have the skills to do so. The Cleveland Clinic, which utilizes its own innovation guidelines, has a few considerations when it comes to creating successful partnerships. Innovation has to be a team sport, where all stakeholders need to be engaged and consulted in order to optimize the outcomes that are important to each partner.[16] Relationship development and management can only occur if common goals and initiatives are highlighted from the beginning.[16] Cleveland Clinic partners with and involves vendors across the healthcare spectrum, from providers to technology companies, and is able to recognize where external contributors may able to allow them to achieve effective co-innovation.

Culture Change within an Organization

Involving and engaging the entire organization throughout the process is necessary to embrace and enact enterprise innovation.[16] Organizations on the cusp of innovation can lay the groundwork by sharing the message that innovation is not just a job for the Research and Development (R&D) team. To participate in innovation, organizations must invest in people and group practices dedicated to mission-driven innovation.[17] Although enabling and creating this environment of innovation can be challenging, there are steps that can make the process more manageable, starting with the creation of an Innovation Council or hiring an Innovation Leader to help spearhead the transition in culture.

In-house innovation champions may already exist in many organizations. Identifying and empowering an internal Innovation Leader can lead to successful follow-through with innovation practices.[16] These advocates must be people who are willing to lead the initiative and contribute their strengths and attributes. An Innovation Council or Innovation Leader can help create and refine training/education programs that foster uptake and usage. For example, Lunch and Learn events create a great opportunity to share information and gain new knowledge and skills.

Innovation does not just happen: employees, health professionals, and researchers need to be educated, and the concept of introducing innovation and entrepreneurship needs to be socialized. An organization should take the approach of creating an ecosystem to help enable a suitable environment for innovation. It is important to foster relationships across organization/government levels to ensure wide uptake and effective usage. Steps to help in building cultures of innovation include:[18]

1. **Build a Community of Practice:** Connect stakeholders, healthcare professionals, patients, developers, engineers, and designers to allow for free-flowing information exchange. These informal settings can create a community of practice, to possibly identify Innovation Leaders.

2. **Share knowledge:** Allow these communities to meet in person and exchange ideas at events throughout the year. Members can teach each other and work on projects together through workshops, Lunch and Learns, or creation of innovation materials for circulation.

3. **Enable collaborative action:** Partner with other organization to enable collaborative action, such as design days, 'ideathons', hackathons, design challenges. This can also allow organizations to expand mandates when a priority may fall out of scope for them, to allow them to innovate and grow with other organizations.

4. **Accelerate impact:** Facilitate collaborative action and project implementation (through the strong partnerships established through the process) through partnering institutions and companies together.

5. **Transform institutions and regions:** Help organizations transform themselves, so they can generate ideas, design solutions, implement projects, continuously innovate. Work hand-in hand with patients and the communities, create examples for other communities to view and learn from.

Healthcare Innovation and Funding/Partnership

A governmental shift may be required in order to allow for meaningful and impactful innovation to occur. Increased focus and incentives placed on research and development could spur development of new medical, device, and pharmaceutical technology for use in healthcare.[19] Incentive-based programs could promote adoption of cost-effective drugs, treatment methods, and diagnostic tests.[20]

Business model innovation needs to occur, with strategies in place to consider and carry out maximum overall value and impact. The ideal solution design and procurement process will involve patients, clinicians, and senior leadership early in the innovation process. It may be beneficial to incentivize/encourage healthcare providers to partake in the creation of solutions through their organizations. Meaningful innovation considers the broader value that can be added to the system, such as reducing treatment costs and improving long-term patient outcomes.[21]

Organizations also need to evolve in their method of funding allocation and move from the "spray and pray" model to something akin to the Stage Gate Funding Model, where a new idea passes through a set of goals ("gates") in order to progress.[22] This gated funding model can help limit the risk of taking on innovative projects, as any idea needs to meet predetermined standards before it can be adopted. The existing method of allocating an undefined amount of funding to a project without meaningful review or discussion is not the method by which innovation projects should be taking place.

While Canada's current fee-for-service compensation system lacks incentivization for innovation, positive examples of a shift toward change do exist, such as the Integrated Comprehensive Care program at St. Joseph's Healthcare in Hamilton. St. Joseph's uses a bundled payment approach, which has shown improved continuity of care, as evidenced by reduced readmission rates for target procedures, higher patient satisfaction, and positive perceptions by both patients and providers.[23]

Another example of healthcare innovation and partnerships and funding that makes a substantial impact on both organizations and patient health is the innovative partnership between SE Health and Trillium Health Partners for Putting Patients at the Heart (PPATH) Program. The collaborative PPATH program simplifies access to follow-up care for cardiac patients, and seamlessly combines hospital and home sectors for a better support system. By bringing together a shared EHR, 24/7 support line, and community nurse supports, cardiac patients can go home faster, post-surgery complications are reduced and hospital readmissions and ER visits are significantly reduced.

Meaningful innovation considers the broader value that can be added to the system, such as reducing treatment costs and improving long-term patient outcomes.

Executive Sponsorship and Leadership

Across all sectors, approximately 90% of projects pursuing innovation fail after the 91st day.[24] One of the primary reasons for failure is the lack of buy-in from key stakeholders and minimal organization-wide support. To unleash innovation in the enterprise, executive sponsorship and leadership support are key elements in the success of new projects and necessary to realizing their impact within organizations.

Sponsorship can exist at the executive, management and/or business unit level. Executive sponsorship can come from groups such as the board of directors, advisory boards, councils and governance structures that include a mix of leaders from government, research, health care delivery, and public and private sectors. Governance structures can also include cross-sectoral members, system -level thinkers, designers, entrepreneurs and futurists and disruptors who seek emerging innovative opportunities. In order to implement a successful project, these forms of sponsorship and support are required to ensure projects are targeted, strategic and funded within the organization.[25] As a result, this will ensure alignment between the strategy of the business and the execution of the delivery of the projects ultimately resulting in systemic and lasting success.[25]

Example: the innovation team at the Mayo Clinic developed a strategy that included biweekly executive briefings.[24] During the meetings, the innovation team would prepare tangible products for executives to review and provide feedback. The outcome of these meetings ensured that the products were aligned with the organizational business needs and decreased the chance of the products encountering poor uptake and rejection. The innovation team was able to ensure the projects moved quickly and continuously through the development process because they knew they had buy-in from executive leadership across the entire duration.[24]

Along with executive sponsorship, innovative leaders contribute to the overall drive and impact projects have within organizations.[4] These are individuals who develop a culture that encourages and rewards risk-taking and emphasizes the importance of collective success. Leaders have the ability to integrate innovative ideas into the operations of an organization by aligning activities with its mission, vision and values.[26] Leaders have the ability to evaluate the organizational structure, assess community and team needs, and cross-fertilize project management, innovation and operations while course-correcting the plan to ensure optimal results. Innovation-friendly leaders value the function of the business and the design components of the organization. They acknowledge that innovative projects are funded differently and are equally as important to the operations of an organization. The Innovation Leader's title—Chief Marketing Officer, Chief Innovation Officer, or Champion of Innovation—should align with an organization's mission, vision and values and invite people into the innovation process (Appendix E).

An organization with innovation projects supported by executive sponsors and strong leadership across all levels will succeed in promoting and delivering breakthrough solutions without disrupting existing day to day operations.

Flexible Innovation Strategy and Adapting to Change

Tight controls can strangle innovation. The Working Group members expressed that quarterly reporting cycles and funding models can limit or even prevent innovation. For innovation to thrive, organizations should adapt to changing environments and accept failure and/or deviation from plans when exploring new domains.[25] Setbacks are a necessary prerequisite for growth and learning, and allow for time to assess if ideas are desirable, viable and feasible for the next stage of development. Unexpected opportunities can emerge from times of failure or deviation.[25] Knowing this, organizations should consider developing dynamic structures and processes to respond to changes. For example, instead of structuring projects based on KPI's, milestones and scope requirements, teams could adapt to shorter iteration cycles, set measurable targets, and make time to refine products based on feedback from users and stakeholders.[25] Sifting out the best and most viable project starts with an iterative creative process that allows ideas to be developed, tested and refined multiple times.

Example: SE Health's Futures team has established an innovation framework and a "minimally viable innovation system" to clarify internally and externally what type of innovation projects should be pursued or not pursued as well as the key methodologies to move from a problem/idea to impact at scale (Appendix C).

Organizational Collaboration and Empowerment

For innovation to reach its full potential, businesses should ensure sufficient collaboration and information-sharing is practiced throughout the organization.[28] Creating a culture that supports innovation includes developing behaviours and structures that promote frequent knowledge-sharing, cross-functional team building, procedural idea development, and idea champions. To establish a culture that pursues innovation and change begins from the top. Change leaders who pursue innovation have the influence to define innovation, encourage behaviour that motivates teams to be experimental, and seek innovative ideas. Talent should be continuously cultivated and individuals across organizations should feel supported and empowered to identify a problem and think of a solution that aligns with the organization, its operations, and the needs within the healthcare system.[29] The location of the innovation relative to organizational operations matters. In order for innovation to be sustainable and scalable within an organization, the two areas should work in close proximity.

Encouraging collaboration across a wide array of stakeholders within an organization will enable the formation of cross-functional teams and produce unique perspectives towards the problem-solving process. Innovation within an organization does not have to be grand or expensive; organizations can start small by providing a platform for company-wide dialogue on innovation to take place (e.g. Slack, Trello, Microsoft Teams, technology and innovation rounds, etc.).[28] For example, organizations can create an online submission process to engage staff in the conversation. Alternate opportunities can be in the form of educating teams to help them to understand what innovation looks like within the organization and how to evaluate it against a predefined set of criteria.[28]

"...improved collaboration has always been the key. When people communicate, they develop relationships, and when they have strong relationships, they're united. When you empower and free employees to be creative and accountable, they give you more than you expect. This is how innovation happens."[27]
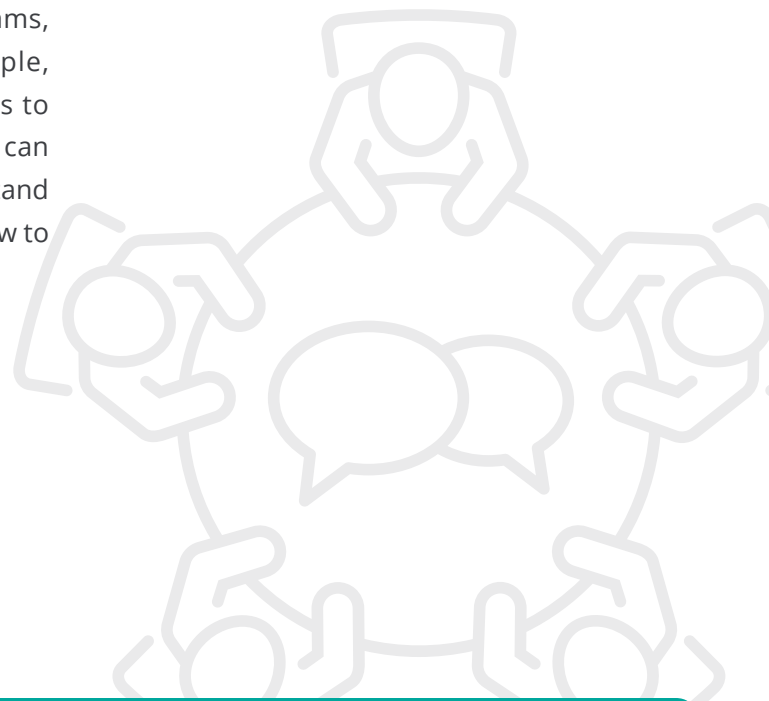
Conclusion

There is no right way to meet the challenge of pursuing enterprise innovation in the Canadian health system. The following recommendations should be taken into consideration to drive enterprise innovation within healthcare organizations (Appendix A):

1 Culture change within an organization ensures enterprise innovation will occur at all levels. Creating transparent innovation councils, appointing an innovation leader and implementing training/education programs can contribute to uptake and usage. Innovation doesn't just happen; it helps to socialize the concepts of innovation and entrepreneurship through organization-wide education.

2 Innovation partnerships make room for multidisciplinary collaborations and long-term partnerships dedicated to fostering innovation, and provide resources, knowledge, and mentoring. They help bring new ideas to the market through communication, collaboration, and acceleration.

3 Business model innovation and innovative procurement models are needed to carry out maximum overall value and involve clinicians and senior leadership from the beginning. Promote healthcare innovation funding and incentives with a government focus on R&D through incentive-based programs to promote adoption of digital health.

4 Executive sponsorship and leadership support offer a powerful and immediate way to invest in the success of projects and their impact within organizations.

5 A flexible innovation strategy enables organizations to respond and adapt to change environments where new opportunities can be discovered and pursued.

6 Encourage organizational behaviour and structure that promotes frequent knowledge-sharing, cross-functional team building, procedural idea development, idea champions, and design and system-level thinkers. A culture of organizational empowerment will enable innovation to reach its full potential.

As organizations invest time and effort towards establishing enterprise innovation, it is beneficial to acknowledge the lessons learned and build on them. Innovation can be large or small, but ultimately should impact and add value to every organization and, ultimately, the health system in which they operate.

Appendix A

The following is a checklist for organizations on how to drive enterprise innovation:

1. Ecosystem of Innovation

- ☐ Identify partner organizations with varying expertise and create multidisciplinary collaborations and long-term partnerships between companies with similar mandates and goals
- ☐ Create an atmosphere to allow sharing of resources, knowledge, and mentoring
- ☐ Enact and embrace the methodology of bringing new ideas to market through communication, collaboration, and acceleration

2. Culture Change within an Organization

- ☐ Emphasize that innovation is everyone's responsibility across an organization
- ☐ Create training/education materials to ensure the entire organization is aware of and can get involved in the innovation process
- ☐ Create opportunities for knowledge and skills sharing within communities of practice
- ☐ Develop a plan on how to roll-out a communications plan for innovation across an organization from an executive level

3. Healthcare Innovation and Funding Incentives

- ☐ Focus on meaningful innovation that considers the broader impact on the healthcare system, not just within organizations
- ☐ Innovative procurement needs to involve patients, clinicians, and senior leadership from the very beginning
- ☐ Incentivize/encourage physicians to partake in the creation of products and services through their organizations

4. Executive Sponsorship and Leadership

- ☐ Ensure that executive sponsorship and leadership exists to overlook the innovation project as it will ensure alignment between the strategy of the business and the execution of the delivery of the projects ultimately resulting in systemic and lasting success
- ☐ Establish a strategy on how to engage senior leadership across the duration of the innovation project
- ☐ Identify an innovation leadership team and assign the appropriate titles that align with an organization's mission, vision and values and invites people to the innovation process (e.g. Chief Innovation Officer, Champion of Innovation, Chief Technology Officer)
- ☐ Establish an advisory board and/or governance structure that contains the appropriate subject matter experts (e.g. research, industry experts, government, not-for profit sector)

5. Flexible Innovation Strategy and Adapting to Changes

- [ ] Establish a strategy that contains dynamic structures and processes to respond to unexpected deviations from the original plan
- [ ] Incorporate iterative processes that allow ideas to be developed, tested and refined multiple times.
- [ ] Develop an innovation framework that the organization can refer to as innovation projects launch and require evaluation as they move through different stages

6. Organizational Collaboration and Empowerment

- [ ] Sufficient collaboration and information sharing should be practiced throughout organizations
- [ ] Establish a culture that promotes frequent knowledge-sharing, cross-functional team building, procedural idea development and idea champions
- [ ] Ensure leadership teams encourage behaviour that will empower teams to be experimental and seek innovative ideas

7. Implementation and Measurement

- [ ] Need flexible timelines for implementation, to avoid fatigue and failure
- [ ] Avoid diffusion effective ares (over-adoption)
- [ ] Innovation projects need to be tracked and measured throughout the lifecycle, with the risks and uncertainty, potential profitability, learning velocity and time spent, and cost set forth and tracked from the very beginning
- [ ] Evaluation of process and outcomes needs to be ongoing, beyond the pilot or early introduction phase
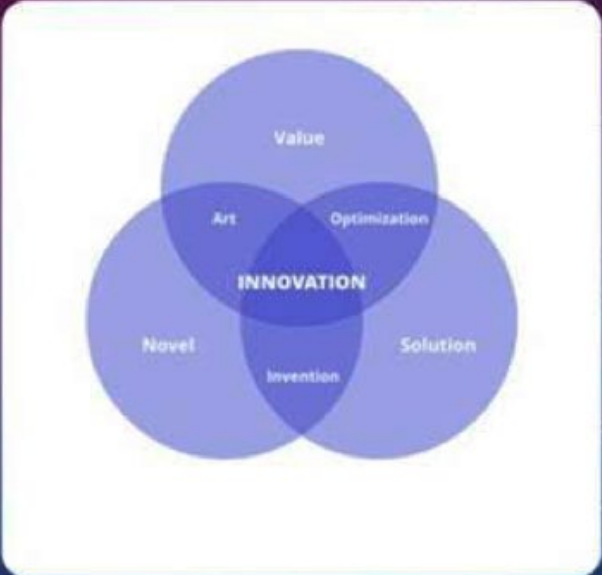
Appendix B

Innovation definition adopted by the The Children's Hospital of Eastern Ontario:

Appendix C

SE Health's Futures team has established an innovation framework and a "minimally viable innovation system" to clarify internally and externally what type of innovation projects to pursue (and, more importantly, what not to pursue), as well as the key methodologies to go from problem/idea to impact at scale.

SE Health's Innovation Process:

As possible potential solutions are vetted through the innovation framework, a "three parallel lenses" innovation process is used to determine a solution's desirability, feasibility and viability. SE Future's team is looking for a solution to capture the "sweet spot", which is met when the solution is able to create, capture and deliver value to the market.


Innovation Process: Three Parallel Lenses
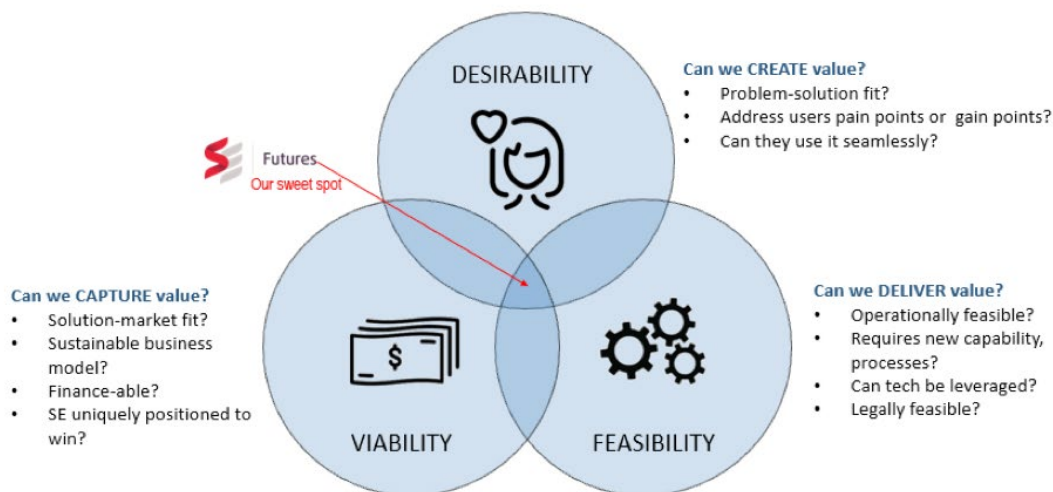
SE Health's Innovation Framework:

Informed by Ralph Christian Orr's **integrative innovation management** thinking, SE Health has adapted **McKinsey's Three Horizons of Growth Framework** to determine how to invest time and resources. Their portfolio of innovative projects spans three horizons or playing fields: <10% of the portfolio (Playing field 1), to optimize the current business; ~50% of the portfolio (Playing field 2) to reshape the core through adjacent business models and/or capabilities that are new to SE Health; the remaining >40% of the portfolio to create practices and business models that are new to the world.
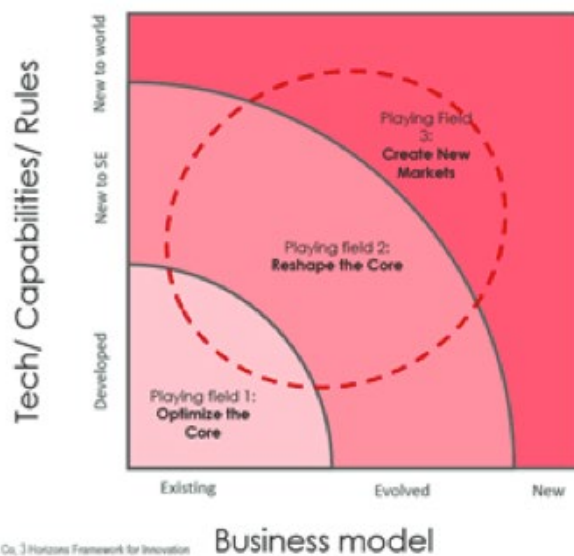
With these priorities in mind, SE Health's Minimally Viable Innovation System is comprised of a few key building blocks:

1. **Purpose:** To create a future where Canadians age with health, vitality, dignity and agency.

2. **Methodology:** Four-step methodology to go from idea/problem to impact, which balances three interdependent value proofs: desirability (can we create value?); viability (can we capture value?); and feasibility (can we deliver value?).

3. **People:** The internal staff (core methodologists + extended teams) to lead and drive the work

4. **Network of partners and collaborators:** None of SE Futures' work could be done without partners, because Horizon 2 and 3 innovation can only happen at the boundaries of multiple parts of the health system, and multiple sectors of civil society (e.g. housing, social services, hospitals, primary care, home care).

INNOVATION PROCESS

	Frame Intent	**Deep Dive**	**Generate Concepts**	**Test**
Starting with the Problem	Is this a good problem for SEFutures to tackle?	What are the key Opportunity Spaces?	Do we have concepts(an MVP) that are ready to be tested?	Is our concept ready to be made into a product?
Starting with the Product	Is this a good opportunity for SE?	How will the product work? Will the product generate new value for SE?	Are we ready for a pilot?	Are we ready to scale?

For more information please visit **www.sehc.com/futures**

Appendix D

Southlake CreateIT[13]

A full-fledged incubator launched in partnership with the Town of Newmarket, ventureLAB, Seneca College, York University, and York Region. CreateIT[13] serves as a catalyst for a health tech business cluster. Their Health Ecosphere projects span the topics of big data, health advisory apps, and medical devices. Bringing together private sector organizations with academic institutions, they drive technology through embracing a culture of fail fast: succeed early. Host Dragon's Den events, Open Door"events, and embrace the idea of creating a change ecosystem for innovation. In regard to impact, they have over 20 projects currently in the works and over 30 success stories listed, one being the DashMD pilot, which provides patients with convenient access to treatment plans and community care discovery post discharge.

Innovation Boulevard

A collaboration between the City of Surrey, Simon Fraser University, and Fraser Health Authority, created to foster an environment of innovation and to add economic and social value for these organizations and the larger community. Again, there is a recognition and emphasis placed on partnerships, incubation and acceleration, entrepreneurship, and social innovation to allow for development of solutions to meet pressing healthcare needs.

Hamilton Health Sciences: Synapse Life Sciences Consortium[14]

Through the creation of a cluster of local expertise and resources, their vision is focused on creating an ecosystem to attract investment and develop health innovation for global export. They are focused on promoting and advocating for the interests of the entire cluster ecosystem through facilitation of partnerships dedicated to resolving common challenges and making investments toward shared objectives. This organization runs competitions dedicated to accelerating the commercialization of innovation in the life science sector and have a dedicated innovation portal to help facilitate relationships to connect to the Hamilton health ecosystem.

Hacking Health[15]

By facilitating cross-disciplinary innovative collaborations, they help generate fresh insights and creative solutions to work collaboratively and provide tangible solutions to current challenges. They do so by focusing on creating and maintaining an ecosystem of innovation, that builds communities, and shares knowledge to allow for collaborative and accelerated action resulting in transformations. CareKit was created during the 2015 e-Health Conference in Toronto for the Hacking Health Design Challenge. This comprehensive software/hardware solution enables monitoring and management in real time of at-home patients with the use of wearables and sensors.

WCH Institute for Health System Solutions and Virtual Care

An example of a "living laboratory", bringing together scientists and innovation fellows to develop, implement, and evaluate new ways of delivering care. Working to get real-time feedback and make patients engaged in their own healthcare by tackling health gaps through scalable solutions. Examples of projects are reducing unnecessary echocardiogram ordering, creating a care plan for cardiac rehab patients, and working with OTN to have patients more involved in their care management.

Newfoundland and Labrador Centre for Health Information

Through the creation of Bounce Innovation, the province brings together a multidisciplinary approach to tackling healthcare solutions and provides resources, coaching, and partnerships to accelerate health innovation. The site exists within the Memorial University campus, and allows individuals from the medical school, engineering program and business degree programs to come together and work on projects. Through a hackathon event, the creation of a Cardiology software program emerged that is now being used in the Cath labs.

Appendix E

A title that is chosen for an innovative leader should align with an organization's mission, vision and values and invite people to the innovation process. Innovative leadership titles can include the following:

- Chief Marketing Officer
- Director of Design and Brand Experience
- Chief Innovation Officer
- Champion of Innovation
- Chief of Design Director of Global Innovation
- Director of Strategy Innovation

- Director of Strategic Marketing
- Innovation Champion
- Vice President Enthusiast Service
- VP Strategic Leadership and Competency Creation
- Chief Technology Officer

References

1. Pan-Canadian collaboration on health-care innovation can deliver real change. The Hill Times [Internet]. 2016Mar7 [cited 2019Mar24]; Available from: https://www.cfhi-fcass.ca/sf-docs/default-source/ newsevents/hill-times-maureen-oneil-march-2016.pdf?sfvrsn=9589d344_2

2. Shaw J, Tepper J, Martin D. From pilot project to system solution: innovation, spread and scale for health system leaders. BMJ Leader. 2018;2(3):87–90.

3. Herzlinger RE. Why Innovation in Health Care Is So Hard [Internet]. Harvard Business Review. 2014 [cited 2019Mar24]. Available from: https://hbr.org/2006/05/why-innovation-in-health-care-is-so-hard

4. Porter-OGrady T, Malloch K. Quantum leadership: creating sustainable value in health care. Burlington, MA: Jones & Bartlett Learning; 2018.

5. Innovation in Health Care [Internet]. Digital Health in Canada | Better Health Together. [cited 2019Mar24]. Available from: https://betterhealthtogether.ca/digital-health-in-canada/innovation-in-health-care

6. Golding L. Innovation in Canadian Healthcare: What Are We Talking About?. A Canadian Healthcare Innovation Agenda: Policy, Governance, and Strategy. 2018 Apr 30;195:21.

7. Kimble L. Rashad M. What Do We Mean By Innovation In Healthcare?.European Medical Journal [Internet]. 2017. Available from: https://www.emjreviews.com/what-do-we-mean-by-innovation-in-healthcare/

8. ISED Canada. Report from Canada's Economic Strategy Tables: Health and Biosciences [Internet]. Economic Strategy Tables. Government of Canada; 2018 [cited 2019Mar24]. Available from: https://www.ic.gc.ca eic/site/098.nsf/eng/00025.html

9. Eggers, William D., and Joel Bellman. "The Journey to Government's Digital Transformation: Executive Summary." Deloitte Insights. October 2, 2015. Accessed April 27, 2019. https://www2.deloitte.com insights/us/en/topics/digital-transformation/digital-transformation-in-government-summary.html.

10. Collier R. Canadian health care lacks culture of innovation [Internet]. CMAJ. CMAJ; 2018 [cited 2019Mar24]. Available from: http://www.cmaj.ca/content/190/36/E1089

11. Garven, G., Mitchell, D., Ledwell, P., Macmillan, P., Gordon, J., & Valliquette, A. Innovation in government? Conversations with Canada's public service leaders. [Internt]. Deloitte and Public Policy Forum/ [cited2019Apr27].

12. Advisory Panel on Healthcare Innovation. Unleashing Innovation: Excellent Healthcare for Canada [Internet]. Health Canada; 2015 [cited 2019Mar24]. Available from: http://healthycanadians.gc.ca/publications health-system-systeme-sante/report-healthcare-innovation-rapport-soins/alt/report-healthcare innovation-rapport-soins-eng.pdf

13. MacNeil M, Koch M, Kuspinar A, Juzwishin D, Lehoux P, Stolee P. Enabling health technology innovation in Canada: Barriers and facilitators in policy and regulatory processes [Internet]. Health Policy. Elsevier; 2018 [cited 2019Mar24]. Available from: https://www.sciencedirect.com/science/article/pii S0168851018305396

14. The CreateIT Now Difference [Internet]. Southlake Regional Health Centre - The CreateIT Now Difference. [cited 2019Mar24]. Available from: http://www.southlakeregional.org/Default.aspx?cid=1425

15. About Synapse [Internet]. Synapse Life Science Consortium. [cited 2019Mar24]. Available from: http:/ synapseconsortium.com/about-synapse/

16. WHO WE ARE [Internet]. Hacking Health. [cited 2019Mar24]. Available from: https://hacking-health.org/who-we-are/

17. Graham, T. J. (2016). Innovation the Cleveland Clinic way: Powering transformation by putting ideas to work. New York: McGraw-Hill Education.

18. Kinisky T. Three Steps To Achieving A Culture Of Enterprise Innovation [Internet]. ChiefExecutive.net. 2018 [cited 2019Mar24]. Available from: https://chiefexecutive.net/three-steps-achieving-culture-enterprise-innovation/

19. BUILDING ECOSYSTEMS OF INNOVATION [Internet]. Hacking Health. [cited 2019Mar24]. Available from: https: hacking-health.org/building-ecosystems-of-innovation/

20. C.D. Howe Institute-Annual Report 2017 [Internet]. C.D. Howe Institute. [cited 2019Mar24]. Available from: https:/www.cdhowe.org/annual-reports/annual-report-2017

21. Sullivan SD, Watkins J, Sweet B, Ramsey SD. Health Technology Assessment in Health-Care Decisions in the United States. Value in Health. 2009;12.

22. Jones, S. S., Rudin, R. S., Perry, T., & Shekelle, P. G. (2014). Health Information Technology: An Updated Systematic Review With a Focus on Meaningful Use. Annals of Internal Medicine, 160(1), 48-54. doi:10.7326/m13-1531

23. McKinney, P. (2018, December 21). How To Use A Stage Gate Funding Model To Create Your Innovation. Retrieved from https://beyondtheobvious.com/stage-gate-funding-model-to-create-your-innovation/

24. Integrated Comprehensive Care - Bundled Care [Internet]. Integrated Comprehensive Care. 2017 [cited 2019Mar24]. Available from: http://www.sjhs.ca/integrated-comprehensive-care-project.aspx

25. Top Ten Do's and Don'ts For Disruptive Healthcare Innovation Strategy | Thrive Thinking [Internet]. Thrive. 2017 [cited 2019Mar24]. Available from: https://thrivethinking.com/2017/03/07/disruptive-healthcare-innovation/

26. How to Unleash Innovation in the Enterprise [Internet]. ThoughtWorks. 2015 [cited 2019Mar24]. Available from: https://www.thoughtworks.com/insights/blog/how-unleash-innovation-enterprise

27. Weintraub P, McKee M. Leadership for Innovation in Healthcare: An Exploration [Internet]. International Journal of Health Policy and Management. Kerman University of Medical Sciences; 2019 [cited 2019May6]. Available from: http://www.ijhpm.com/article_3577.html

28. George Soleas: From Chief to Chief Executive [Internet]. LCBO. [cited 2019Mar24]. Available from: https://www lcbo.com/content/lcbo/en/corporate-pages/about/media-centre/corporate-news/george-soleas-profile html

29. Promoting Internal Innovation to Drive Healthcare Efficiency [Internet]. Healthcare IT Today. 2017 [cited 2019Mar24]. Available from: https://www.healthcareittoday.com/2017/06/01/promoting-internal-innovation-to-drive-healthcare-efficiency/

30. Snowdon A, Leitch KK, Shell J. Innovation Takes Leadership: Opportunities and Challenges for Canada's Health Care System. Ivey Centre for Health Innovation and Leadership; 2010.

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