

OROT - Connected Health Incubator, CIUSSS West Central (Montréal)

Category:

Best Incubator, Accelerator, Equity

Program/Fund Name:

OROT - Connected Health Incubator, CIUSSS West Central (Montréal)

Corporate Name:

N/A

Date of Creation:

2020-07-09

Indications:

OROT identifies opportunities, inspires, and accelerates innovation in connected health resulting in impactful and positive change for healthcare systems, providers, and patients.

OROT mobilizes external public and private partners in order to foster partnerships with the Jewish General Hospital and its CIUSSS to innovate, refine, and ultimately bring to reality a variety of products and services, including software and devices.

We approach projects that have the aspiration of research with the speed and ambition of a startup.

Therapeutic Areas:

In order to focus our efforts and resources on the most pressing issues, OROT identifies the most critical unmet needs and creates challenges around them. Here is our current list:

Healthy aging;
Workforce shortage;
Virtual care;
Optimization of workflows.

FUND & SERVICE File Document upload:

History of the development of the fund / Incubators:

The Canadian healthcare system is publicly funded, providing reasonable access to healthcare to all its citizens. The federal and provincial governments share the responsibility of the provision of healthcare, with the majority of healthcare spending managed at the provincial and territorial level.

The Quebec healthcare system is comprised of 34 CIUSSSs. The CIUSSS concept stands for \"Centre intégré universitaire de santé et de services sociaux\" (Integrated University Health and Social Services Center). It is an organizational model that brings together various healthcare and social services under a single administrative structure. Under the CIUSSS model, different entities that were previously separate, such as hospitals, long-term care facilities, clinics, and community health centers, are integrated into a unified organization. This integration allows for better coordination and collaboration among different healthcare professionals and service providers, resulting in improved continuity of care for patients.

The Canadian healthcare system, as well as healthcare systems around the world are facing many issues, including a growing aging population, a rise in chronic conditions and co-morbidities, and increasing constraints on the healthcare workforce. As healthcare organizations face unprecedented challenges to improve quality and access, reduce harm, increase efficiency, eliminate waste, and lower costs, innovation is becoming a major focus. Under the current circumstances, working harder is simply not enough. Indeed, it is only by fostering digital transformation through wide scale technology adoption that we will have a chance at sustaining the future health and social care systems.

The advent of digital health technology is undoubtedly a major transformation vector. Digital health involves the convergence of health technology, digital media, and mobile devices. These enable patients, caregivers, and healthcare professionals to readily access and provide care remotely while potentially enhancing the quality and outcomes of health and socially pressing issues. More specifically, technologies from data science, deep learning and artificial intelligence represent ground-breaking innovations in life sciences and digital health. The digital revolution is also disrupting the ways health and social services are organized and delivered. Indeed, the benefits are numerous. These include:

Streamlined communication among various disciplines and health care workers

Ready access to specialized resources via telemedicine - particularly needed in remote areas

Equipping patients and caregivers to manage their health more effectively

Yet, despite substantial investment of \$25.9 billion in 2022 globally and enormous potential, few companies have been able to develop and integrate technologies that truly transform healthcare. One of the reasons digital health innovations fall short is because they apply a strategy to healthcare that was developed and refined in the tech sector, an entirely different industry with its own normative and methodological framework.

History of the development of the fund / Incubators:

Consumer technology startups often push quickly to get a minimum viable product to market and then iterate to improve that product based on what most resonates with consumers. Entrepreneurs and investors from the tech world mistakenly assume that this \"lean startup\" approach, which works well for products like photo-sharing tools and meal-delivery apps, should be equally successful for tackling any kind of problem. However, this strategy is ill-suited to healthcare, a much more complex and regulated industry.

Digital health products must meet the needs not only of users, but also of a diverse set of stakeholders—from physicians to patients to regulators and insurers—all of whom have a say in the adoption of new digital products. Products, especially those considered medical devices, may take years of jumping through complex clinical and regulatory hoops before they reach the market, and cannot always easily be iterated once they do.

A better approach for healthcare is needs-driven innovation. Rather than leaping to invent a technology and then searching for a challenge it can be used to address, innovators/entrepreneurs start by deeply understanding an important problem in healthcare and then design a technology that is uniquely suited to solve it.

In this context, the Integrated University Health and Social Services Network of West Central Montreal (CIUSSS CCOMTL) and its hub the Jewish General Hospital (JGH) have launched OROT - the Connected Health Incubator. OROT (Hebrew for \"illumination\") has a mission to transform the experience of healthcare through an integrated model of co-development, testing and evaluation and implementation that is user-centric and informed by large-scale data science.

OROT overcomes the issues of the past by giving entrepreneurs access to the vital insights, opinions and suggestions of healthcare users and professionals, in order to ensure that the product will meet everyone's requirements by the time it hits the market. This process also benefits members of staff who may have to modify their work habits when the new product is introduced. By involving staff in the co-creation process at an early point, we are managing change as we go along.

As such, OROT forms a supportive circle around innovators and entrepreneurs to keep them moving in a direction that maximizes their chances of succeeding as quickly as possible. After all, their success is ultimately ours, as well.

HISTORY & FOCUS File Document upload:

N/A

How do you address your portfolio needs:

N/A

Impact / Metrics to measure Success:

N/A

Why your model is innovative, \and/or how it will improve the human condition:

OROT, the Connected Health Incubator, is one of the first incubators in Canada established within the healthcare environment. It continues to lead the way in co-creation and interdisciplinary collaboration, with the aim of supporting digital health innovations that meet user needs and improve health for all.

OROT's foundation is based on the need to integrate solutions that are feasible and acceptable within the healthcare context. Companies are supported throughout the cycle of innovation with guaranteed integration within the CIUSSS. Moreover, through OROT's wide network of national and international healthcare institutions and various other organisations, companies are promoted for wider adoption. In fact, 100% of our partners have seen their technologies adopted in other healthcare systems in Canada and beyond. As such, OROT is internationally distinguished as the rarest of incubators that accompanies companies throughout the cycle of innovation supporting and coaching them until integration.

To ensure inclusivity and the integration of the best solutions possible, companies can approach OROT at any point within the cycle of innovation. This way, the companies that have developed a solution without validating their proposition within the healthcare setting have an opportunity to join OROT's incubation program to ensure its acceptability among users and integration within the digital health ecosystem of the institution. This facet often involves OROT's co-creation methodology, which is inspired by ethnographic research and design thinking methodologies that are relatively unknown and seldom employed in the healthcare sector. Not only is it rare to have access to end-users in the clinical context, it is even rarer that the entire process is

facilitated by design/UI/UX specialists who ensure end-users are an integral part of the design and creation of these solutions.

Beyond ensuring the integration, OROT facilitates the creation of a digital health ecosystem whereby companies are enlightened toward the needs of the healthcare system and the importance and value of open data sharing, interoperability, and ecosystem cohesion of their solutions.

OROT is creating a risk-free environment for experimentation to better meet clinical needs and to enable innovations to flourish that support the ideology of \"Care Everywhere\" - the concept of the right care at the right time provided to the patient at the place most convenient for them.

Furthermore, in order to offer a more balanced approach to accelerating innovations and ensuring their success in the marketplace, OROT closely collaborates with complementary organizations with a common goal - the acceleration and implementation of innovation. Together, our activities reinforce Quebec's competitive advantages and create a growing force in the economy.

OROT's ambition is to bring together two, thus far disconnected, objectives:

- 1) Improving the healthcare sector for the well-being of citizens, by
- 2) Positioning digital health innovation as a driver of economic growth.

The innovations and companies propelled by OROT and its partners are beneficial for citizens, attractive to businesses, profitable for healthcare services, and catalytic for new research and knowledge. By relying on the contributions of a wide range of innovation stakeholders, we create a true virtuous circle of healthcare innovation.

Please provide appropriate references (PubMed, Abstract, Website):

Virtual care or the provision of healthcare services using information and telecommunication technologies has the potential to transform the relationship between provider and patient, and in the process improve outcomes and decrease unnecessary costs. Real-time monitoring of patients (RMP) in their homes reduces hospitalizations and readmission rates, promoting patient-centered care. As a result, RMP facilitates equity in access to services.

The Hospital@Home (H@H) program of the CIUSSS West-Central Montreal, which is also the home of OROT, is the first of its kind in the province, offering hospital-level care to patients in their home environment. Thanks to the use of wearable technologies and IoT

devices such as Biobeat and Vivalink, eligible patients can return home, where they are supervised remotely 24/7 by a dedicated clinical team. All in-person care is provided by the home care nursing team in the community. The H@H model has transformed our approach to healthcare, saving over 7800 bed-days for 682 patients since its launch in 2022.

The program, launched during the peak of the 5th wave of Covid in an effort to create hospital capacity and maintain access to specialized services, has since grown to include over 30 clinical and surgical admission trajectories, and is increasing in relevance as we move through the post-pandemic reality of staff shortages, an aging population, and increasingly complex patient profiles. With 13% growth from year 1 to year 2 (2022-2023), and 43% growth year 2 to year 3 (2023-2024), the significance and value of this program is evident.

To facilitate the program's continued growth and expansion, OROT has initiated collaborations with global and local companies, including [Greybox](#) and Biobeat, to either co-develop, evaluate/pilot and subsequently deploy a range of solutions to optimize the H@H service offer. This is consistent to the mandate of OROT to facilitate a digital health ecosystem approach, whereby companies are guided to collaborate to secure data sharing, interoperability, and ecosystem cohesion, with the aim of creating the efficient, usable, and seamless clinical workflows.

Greybox developed and distributes TAKECARE, a mature remote monitoring platform for patients with cardiovascular diseases, which aims to redefine the relationship between patients and their healthcare team. In its original form, TAKECARE platform was disease-centered. However, through the collaboration with OROT, Greybox has transformed TAKECARE into a patient-centered digital platform that meets the needs of those living with multiple conditions, as well as the expectations of healthcare professionals. Integrated with the C4 platform, TAKECARE allows for patient communication and engagement. The platform is beneficial for clinicians, patients and caregivers alike. For clinicians it fosters:

- Workload and time efficiency
- Better patient supervision
- Patient empowerment
- Automated management system
- Engagement with the circle of care

For patients it provides:

- Better access to care
- Simplicity of use
- Personalized care
- Better outcomes

Whereby 83% of alerts are processed through remote monitoring; 78% increase in

nurse/patient ratio; 0 additional resources needed for follow up; 40x saving per dollar invested; 100% of onboarded patients are at risk; 100% follow up calls made are targeted; 20% reduction in admission and ER visits; 86% patient compliance over 3 months with patients reaching their treatment objectives by using the platform minimum 3 times/week.

As a direct result of our partnership, the company successfully raised investment funds from Investissement Quebec. Furthermore, the solution is currently being rolled out across seven different networks in Quebec.

To further enhance the capabilities of the HOSPITAL@HOME, OROT pinpointed the need for a device capable of delivering near-continuous remote hospital-grade vital signs monitoring. To that end, OROT identified, partnered with and facilitated the market entry of an Israeli-based company, Biobeat. Biobeat has marketed a chest patch for adults that enables close monitoring of several important health measures, including continuous blood pressure, mean arterial pressure, pulse rate, respiratory rate, blood saturation, heart rate variability, stroke volume, cardiac output, cardiac index, on lead ECG, pulse pressure, systemic vascular resistance and temperature. The clinical benefits of Biobeat include:

The patient data collected via Biobeat's devices allows healthcare practitioners to adopt a data-driven approach to personalized medicine

- Access to real-time patient data paired with AI capabilities to provide insights on trends and bring efficiency into the process of healthcare delivery
- Providing an Early Warning Score with customized thresholds per patient and scenario, able to identify changes in vitals and alert on high risk patients
- Optimization of data collection, providing medical staff the required clinical data instantly

Through OROT, our organization obtained a iTransmedtech grant to evaluate the performance of the device, including user acceptance, and accuracy with different skin tones. In doing so, we aimed to validate the feasibility and accuracy of the technology in a real clinical setting and support its regulatory approval in Canada. To expedite the market launch of Biobeat technology, OROT also secured grant financing, facilitated access to distributors and promoted the quality of the partnership with public health authorities resulting in the successful regulatory approval, integration in clinical practice inside our network and an eventual wide spread adoption of this technology across the healthcare systems in Canada.

Another innovative project managed through OROT was a partnership with a Quebec-based engineering firm - Auger Groupe Conseil - specializing in the development and deployment of the Microsoft HoloLens with both Guides and Live-Assist functionalities. Performing several \"first-in-man\" uses including remote

wound-care and remote end-to-end guidance of percutaneous valve implantation, this technology was leveraged to support our virtual care program, creating bespoke solutions. One highlighted program including remote nursing evaluation of patients by Hololens, coupled with Biobeats sensors.

The HOSPITAL@HOME concept - which relies on the combination of the above mentioned technologies - is currently being deployed across eight other networks in Quebec with plans to eventually become standard throughout the province. The combined power of these technologies will help realise important savings, as indicated in the table below (projected savings per full year of operation at full 25-bed capacity):

Project cost - creation of 25-bed bedding capacity

CAD\$1,300,000 (physical ward)

CAD\$346,922 (virtual ward)

CAD\$953,078 (savings)

Annual operating costs for a 25 -patient care unit

CAD\$3,880,000 (physical ward)

CAD\$2,558,104 (virtual ward)

CAD\$1,321,896 (savings)

Total

CAD\$5,180,000 (physical ward)

CAD\$2,905,026 (virtual ward)

CAD\$2,274,974 (savings)

Furthermore, this approach has facilitated user access and improved experience while creating value and savings as can be seen below:

Access creation: 7866 bed days saved, 682 admissions

User experience:

- Overall preference for virtual care (vs traditional model): 88%

- Would recommend virtual care: 100%

- Facilitate recovery 100%

Caregivers : 86% would recommend

Human resources: 3157 salary insurance hours saved in the first year of operation, 46% fewer staff required

Costs (Projected): CAD\$ 1.3 million in savings in recurring operations, CAD\$70,000 in savings in nosocomial infections

The above example clearly demonstrates that OROT, through its innovative, novel, and structured approach, has the potential to create tangible and sustainable benefits for the population, health systems and local economy alike.