

Physical Technology Forum Meeting Report

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At the Impact Centre's forum in January, 75 leaders from academia, industry, government, not-for-profit organizations, and service providers gathered to examine the challenges encountered by Canadian companies, scientists, and entrepreneurs developing physical technologies (PT). The forum took a holistic view and touched on challenges across the entire spectrum of technology readiness levels, from the development in scientific research labs all the way to demonstration and markets.

At this event, over 10 hours of robust discussions were recorded and transcribed to 150 pages of text. The thoughtful contributions found on these pages have been very important as preparation for a forthcoming report on the commercialization of PT.

From the conversations at the forum, the two biggest challenges for Canadian PT startups and small- and medium-sized companies are finding the Highly Qualified Personnel (HQP) and talent they need for their teams and securing enough funding. While the HQP and funding issues are also encountered by businesses in other fields, PT companies face unique challenges related to the creation of physical prototypes, including finding and accessing facilities to produce prototypes and overcoming regulatory hurdles.

Participants offered a range of creative solutions to these and other challenges. They suggested adjustments to government assistance to include financial support for prototype development and to encourage early adoption of Canadian PT products. Establishing co-operative workshop facilities for prototyping and the streamlining and standardization of regulations across Canada would also substantially lower barriers in the commercialization of PT.

A short description of each identified challenge has been included below. Themes have been grouped according to the path that physical technologies would take research and development to regulatory issues and procurement.

1. Institutional Support

Most Canadian universities, colleges, and hospitals generate the knowledge needed for innovative technologies but do not have the infrastructure, funding, incentives, culture, or policies to do all the heavy lifting required for commercializing the scientific advancements that are discovered there.

2. Knowledge Gaps

PT entrepreneurs have a particularly difficult challenge when they start as they need to know about the different resources (e.g. facilities, equipment) that can be accessed to help them build their firm. These resources may be geographically dispersed and under the oversight of different organizations. Startups currently lack knowledge about the available assistance and support, and particularly the resources available in the private sector.

3. Critical Mass

The entrepreneurship community lacks critical mass of successful PT entrepreneurs who have built a company and who are willing to share their experience with the next generation of startups, either as mentors or senior executives. This may be exacerbated by a brain drain to the US because only few Canadian entrepreneurs who move South to grow their companies eventually return.

4. Prototyping

There are few facilities with both the right equipment and the right expertise in place to enable startups commercializing PT to create working prototypes. Those that do exist, such as in colleges, work on different timelines and with different resources than are needed by startup firms. Private facilities are too expensive to be feasible for early-stage PT startups.

5. Manufacturing

Access to small-scale, short-run manufacturing is limited and difficult to find. Without capacity to source manufacturing locally, companies increasingly reach out to foreign markets like China. This process and dependence on international manufacturers to go to scale adds risks and lengthens time for Canadian products to hit the shelves.

6. Regulatory

It is often harder to get regulatory approval in Canada than it is in foreign markets. Some companies are avoiding sales of their innovative products in Canada for this reason. This extends launch times as entering foreign markets can be more complex. In turn, international customers may also delay their decisions without knowing how the product was validated in Canada.

7. Government Procurement

There are few government programs that actively work with startups (especially in health technologies) to test and validate new products by becoming the first buyer and a reference site. Those that exist are difficult to access with cumbersome paperwork.

8. Government Support

Currently, there are no government programs that support early-stage PT commercialization in a startup without requiring some external matching of funding. And yet, little matching funds are available from angel investors and venture capitalists at such an early development stage. So, it is easier for innovators and institutions to license the technology to a third party that can afford to pursue the commercialization.

9. Access to Capital

Due to the risks and lengthy commercialization times associated with PT, the probability of securing external funding is very low, particularly without the ability to obtain market validation until product development has reached a stage where customers can understand its potential applicability. Without market validation, venture capitalists and other investors will not support a company.

10. Talent

Startups find it difficult to hire the right talent at the right stage of development. Canadian companies are put at a disadvantage in luring the best talent as they usually cannot offer the salaries that similar US companies can.

In tackling the PT commercialization gap, we have to recognize a wide range of issues encountered by different types of PT developers and supporting organizations. Some technologies may start out in higher education institutions and hospitals and follow the path to procurement and customers. Others may result from 'intrapreneurial' efforts in existing small- and medium-sized businesses with/without a connection to a college, university, or hospital. As we move toward solutions, we must bear in mind the diversity of potential commercialization paths.

Stay tuned for more details in an upcoming report!



UNIVERSITY OF
TORONTO

Impact Centre
Suite 411 - 112 College Street
Toronto, Ontario
Canada M5G 1L6

Tel: 416-978-3875
info@imc.utoronto.ca
www.impactcentre.ca