

GAINING ECONOMIC VALUE OUT OF INNOVATION

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WHEN BUSINESS and public policy conversations turn to Canada's underperforming economy, a finger is often pointed at Canada's so-called innovation gap. Some individuals and organizations contend, however, that Canada suffers from a gap in commercialization, not innovation. To get perspective on the issue, the Canadian Advanced Technology Alliance (CATA), Canada's largest high-tech association, conducted a major study in 2011. Unlike many

earlier studies that dealt with innovation and its role in research, the CATA study, titled *Effective Commercialization of Innovations in Canada*, focused on the commercialization activities of Canadian companies and impediments to their market success.

CATA surveyed more than 1000 Canadian executives and conducted comprehensive follow-up roundtable discussions across the country. Universities, major Canadian industry associations and a number of federal and provincial organizations were partners in the study. This article focuses on the main findings of the study and the roundtable talks.

DEFINING COMMERCIALIZATION AND INNOVATION

Commercialization of innovations was defined as the process of generating greater wealth for individuals, businesses and/or society at large in exchange for new or improved products, processes or services.

Innovation, on the other hand, is a means to an end; it plays a crucial role in creating a competitive business advantage pertaining to:

- the desirability and affordability of products and services;
- the effectiveness of interactions with the market (environment);
- the efficiency of internal and external operations;
- a culture of leadership, which defends it against stagnation and death; and
- luck.

DEFINING THE GAP

The CATA study highlighted four main factors of the commercialization gap:

1. A lack of commercialization expertise and business management acumen handicaps companies that do not have adequate markets at home and therefore must look outside Canada's borders;
2. A weak culture of collaboration exacerbates the difficulties of operating in a global marketplace dominated by strong competitors;
3. Insufficient capitalization and funding for commercialization make companies easy prey for foreign companies, sending the benefits of Canadian innovations and high-value jobs abroad; and
4. A lack of competitive drive and strength prevents companies from succeeding in fiercely competitive world markets.

Small and medium enterprises (SMEs), which comprise more than 99.5 per cent of Canadian companies, are most affected by these factors.

A chief finding of the study and roundtable discussions is that Canadian industry excels globally when SME executives focus first and foremost on customers and competitiveness. For instance, targeting marketing and sales in advance and collaborating with the right partners, including those with financial and strategic business development support, often leads to success. As the management firm Booz & Company demonstrated in *Why Culture is Key*, its 2011 innovation study, "spending more on R&D won't drive results. The most crucial factors are strategic alignment and a culture that supports innovation."

To manage business innovation properly, all aspects of the innovation value chain must be addressed. These include idea generation and acquisition, innovation development and "productization," and commercialization. While research enables the transformation of money into knowledge, the process of commercialization materializes the value of innovation. In effect, commercialization transforms knowledge and a company's products or services into money.

Let's now examine the four aspects of the commercialization gap in more detail.

1. Lack of commercialization expertise

The CATA study showed that Canadian industry lacks commercialization expertise, a spirit of business competitiveness and global market connectivity. For example, 44 per cent of the companies said they failed to commercialize some aspect of their innovations, while 56 per cent had not completed—nor proven successful in—the commercialization of other innovations.

Next to financing, the main obstacles to commercialization are related to the state of commercialization and business management expertise. The obstacles include insufficient marketing and marketing expertise, lack of qualified commercialization personnel, uncertain market demand, poor market knowledge, inappropriate

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customer targeting, and lack of sales expertise. Similarly, channel-to-market issues like difficulty finding commercialization partners and market (sales) channel issues all reflect the immaturity of many Canadian companies and how they commercialize their innovations.

The factors that governments pay attention to—trade tariffs, taxation obstacles, and legal or administrative obstacles in Canada or abroad—appear to play a lesser role than commercialization expertise.

Astoundingly, 17 per cent of the companies surveyed had not commercialized any innovation over the last five years. They cited poor marketing and selling abilities and a sustained lack of funding. Unless these companies sell unchangeable commodities, how can they survive?

2. Weak culture of collaboration

The scientific-technical and business knowledge accumulated to date, the need for higher specialization, anytime-anywhere access to information, and market globalization have led industry to evolve from an integrated product paradigm to a knowledge services economy. As a result, the name of the game has shifted from direct cost control to collaborative value creation in communities of interest.

A company needs expertise to succeed: industry and technology knowledge, management and operations capabilities, and access to target markets. SMEs need to complement their internal expertise with that of their business partners. In this context, it is surprising to find that more than half the companies in Canada do not have any form of co-operative agreement, unwisely thinking that they can succeed by themselves.

The weak state of collaboration for commercialization is reflected in the poor use by Canadian companies of lead customers and, especially, anchor companies. Indeed, only about 42 per cent of the Canadian companies surveyed take advantage of lead customers (customers that help define and develop a product good enough to be purchased earlier than the rest of the market) and fewer than 20 per cent of companies enjoy the benefits of working through anchor companies (large companies with a cluster of small companies that take advantage of its commercialization and technical capabilities).

The reality is more troubling. Fewer than 30 per cent of the 20 per cent of companies using anchor companies do so to distribute products or services. Most of these companies focus on product or service development, rather than market success.

3. Insufficient capitalization to survive and prosper

Canadian industry, especially SMEs, lack adequate funding. Fewer than 36 per cent of the Canadian companies surveyed reach their funding targets for commercialization. Their low level of capitalization renders them uncompetitive and unsustainable local players. As a result, they become easy targets for foreign takeover, forfeiting the benefits of their innovations.

In addition, the companies studied take on average 1.5 times longer to commercialize an innovation to the point of recouping costs than to develop an idea into a market-ready product or service. As a result, the total time from concept to a break-even commercialization point is typically between four and seven years.

Many SMEs are run by scientists and engineers enamoured of their innovations. These individuals tend to focus company funds and expertise on perfecting the innovations while expecting commercialization to be quick, straightforward and affordable.

A majority of these companies fail not because they lack product or technology innovation, but because they lack the expertise and financial means to commercialize their innovations before they exhaust all their funding.

4. Lack of Canadian competitive drive and strengths

Using a self-assessment tool, corporate leaders rated their companies against their main competitors on 21 factors, including cost of developing technology, competitor knowledge, business partners and customer support.

While the companies were shown to have good technology and products or services, they lack marketing and sufficient channels to customers, which results in low revenues and poor financial health. This state of non-competitiveness led Stephen Hurwitz, an American investment lawyer, to state the obvious in the paper *Beyond R&D: Canada's Commercialization Challenge and How to Meet It* (www.choate.com/media/pnc/0/media.3040.pdf): “The Canadian government’s support for R&D of its emerging technology companies has become, in effect, a subsidy to US businesses, which acquire the most promising of these capital-starved but R&D-rich Canadian companies cheaply, then reap the financial rewards by commercializing that R&D and bringing those companies to industry leadership.

“Worse still, these companies are often moved to the US, resulting in the loss of Canadian jobs, revenues and exports. The bottom line: Canada is losing much of the benefit of its billions of dollars in R&D funding for its emerging technology companies.”

MOVING FORWARD: ENHANCING CANADIAN COMPETITIVENESS

While the CATA study uncovered significant weaknesses in Canadian industry, the regional roundtable discussions produced several ideas to enhance competitiveness. According to industry executives, Canadian industry, especially SMEs, need to:

- (a) build strategic alignments—plan, structure, invest and act comprehensively as per company drive, be it “built-to-flip” or “built-to-lead”;
- (b) focus strategically on customers and competitiveness—ensures that their

companies are well-positioned and ready to commercialize innovations even before they are ready for market;

- (c) target marketing and sales in advance—as time in the market is crucial and any time lost has dire consequences. Treating the customer as “king” and getting the right customers takes considerable know-how and resources, so companies should have business development, marketing and commercialization experts who understand what customers want, need and are ready to buy. Alternately, companies can seek partners with these strengths;
- (d) collaborate to conquer—corporate leaders must understand that global success requires partnerships with established local players who can act fast and decisively to produce tangible results; and
- (e) go for the smart money—industry executives should integrate financial and strategic support by enlisting investors who can connect them with valuable business partners and strong market channels.

IDEAS FOR GOVERNMENT

If Canadian industry is to be more successful, provincial and federal governments must accept that supporting scientific research and exploratory development is necessary but it is not sufficient. Corporate failure usually results from poor business management, low commercialization and poor market connectivity. Companies also need ample financial resources to develop products and build channels to market.

One of the most crucial roles of government is creating a business-friendly environment—one that offers an enabling regulatory system, a culture of business leadership, and capabilities for scientific and technology developments. Equally important are sound business management, commercial expertise, adequate risk capital and financial support for global success.

Ideas for provincial government

Provincial government also helps build and maintain an environment of industrial success. With a responsibility for education, provincial government can create the expertise to enable local industry to succeed economically and socially.

- (a) educate for business success—courses on business management, marketing, customer relations, project management and financial management should be compulsory for all science and technology students at the university and college level. Policies and programs should encourage university and college students to learn about industry and gain work experience while they are in school. A culture of value-creation and business success should be instilled in primary and high schools, as this is a critical time to acquire core competencies and skills;
- (b) act as community catalyst—provincial governments are well positioned to understand the needs of local companies and can act as catalysts for their market success by:
 - providing tax treatment conducive to commercialization success in key industries. This would allow large companies registered in the province to act as anchor companies for SMEs,
 - creating an effective venture capital and angel environment to encourage private investors to participate more actively in promoting success in their provinces, and
 - participating directly in commercialization of local innovation by strategic purchases that reference customer values to local industry; and
- (c) targeted marketing outside the province—provincial governments could help local companies market their innovations outside the province in a strategic fashion, taking advantage of the capabilities offered by the federal government.

Ideas for federal government and agencies

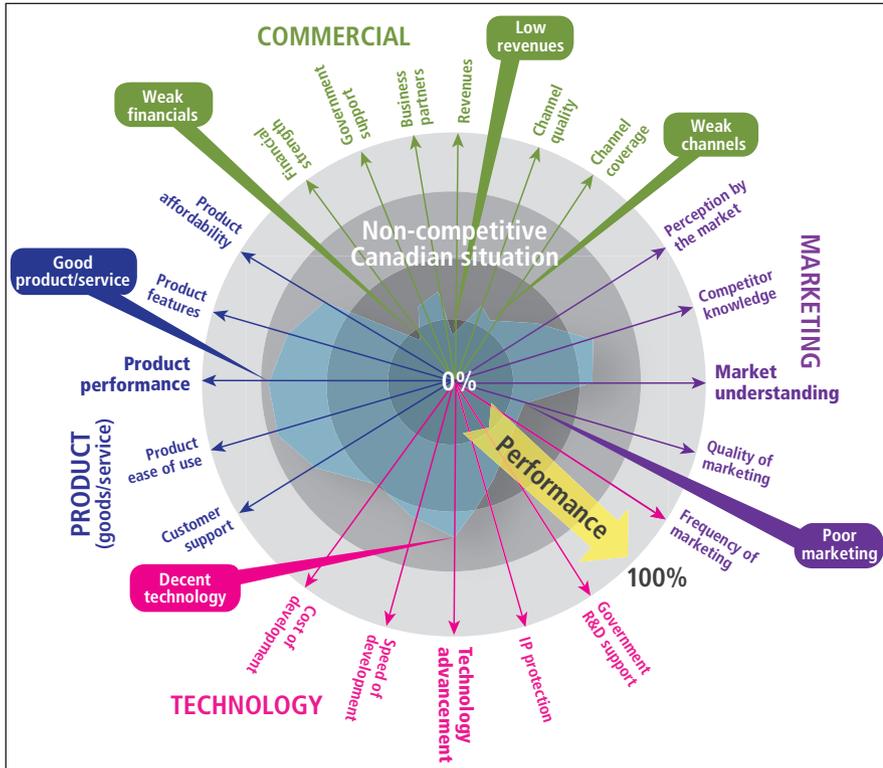
The federal government can set policies and programs that encourage the success of Canadian industry at home and abroad. Participants in the roundtable debates underlined the need for federal government support for a comprehensive structure of agencies, policies and programs to foster global competitiveness, rather than focus narrowly on research and development.

To help Canadian industry compete internationally, the federal government must support competitiveness in all domains critical to global business success. These include financial strength, business and commercial capabilities, and product and technology capabilities.

The main priorities should be to:

- (a) revitalize the Canadian risk capital industry by creating an effective finance system able to help Canadian industry compete and grow globally. This could be accomplished by developing angel investor networks to help entrepreneurs jump-start, develop and innovate their companies, and fostering a self-sustaining private venture capital industry by creating a fund of funds program with the financial strength, investment management and global connectedness to successfully commercialize the research and innovations of Canada’s emerging technology companies. The Business Development Bank of Canada’s role could be enhanced by developing a sound financing system that emulates the “smart money” values of successful American and European venture capital funds. And Export Development Canada could work more effectively with SMEs and service-oriented companies;
- (b) adjust scientific research and exploratory development to support business and reduce waste:
 - include exploratory technology developments as well as commercially oriented innovations in the tax credit program, and

[POLICY ENGAGEMENT]



A competitive guidance tool for an average Canadian company

- end retrospective claims and apply the \$1 billion in savings to help support valued and underfunded programs;
- (c) support SMEs directly via a commercialization research and preparedness assistance (CRPA) program. Most Canadian companies that fail or fall victim to cheap foreign takeovers were not prepared to commercialize their products competitively. A CRPA program could be structured like the Industrial Research Assistance Program (IRAP), while helping SMEs in the pre-commercialization phase to innovate commercial aspects and prepare to compete globally;
- (d) expand strategic government procurement of Canadian innovations. The Canadian Innovation Commercialization Program (CICP) helps Canadian companies by purchasing pre-commercial, Canadian-made innovations. CICP can be enhanced by addressing present and future needs of government organizations as opportunities for further Canadian innovations. CICP must evolve to provide Canadian companies with much-needed first “reference customers” attestation via “user-case study” documents;
- (e) enable a synergistic collaborative environment for industry success. Commercialization-oriented collaboration should be encouraged as much as traditionally supported technical collaborations. The federal government could provide incentives for companies to act as anchor companies for Canadian SMEs, while encouraging more SMEs to cluster around large anchor companies with good reach into world markets;
- (f) support protection and exploration of Canadian intellectual property. Tax-based incentives could help Canadian companies apply for patents, trademarks and brand registrations, thereby protecting their intellectual property;
- (g) support R&D by expanding strategic industrial initiatives. As one of the best-structured and valued federal initiatives, IRAP needs adequate funds to

effectively support Canadian SME technology developments. The federal government could emulate competitive countries by focusing on more applied research and directly supporting strategic industrial initiatives;

- (h) enhance economic value of academic research. A higher proportion of collaboration with industry and insistence on lead customer commitments for a higher percentage of academic research is required; and
- (i) establish a federal government approach to innovation support that is effective, co-ordinated, comprehensive and accountable to industry. Canada has the natural resources, human capital and innovative spirit to develop world-scale industrial successes, provided associated linkages between academe and industry use a strategic approach.

Such a federal innovation structure can succeed only when it is empowered and held accountable. It must also be industry-oriented, flexible and agile enough to respond to global market trends via adjustments to funding mechanisms.

CONCLUSIONS

To address Canada’s commercialization gap, industry leaders and government policy-makers must understand the issues of each industry sector, the appropriate methodologies to manage the innovation process, and the best ways to commercialize each sector’s innovations. Studies should be undertaken to investigate critical aspects of commercialization activities particular to priority industry sectors, and determine policies and programs that could reduce major obstacles to effective commercialization. Σ

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