



## Canadian Competitiveness, Cooperation, and the Promise of Convergence

Recent developments in Canadian Innovation policy hold terrific promise for the nation. Sustained focus on demand-side innovation, the emergence of a re-engineered nation-wide cluster program, and the strengthening of the Canadian innovation eco-system through enabling programs such as incubators and accelerators come to mind. And, perhaps most importantly, a readily discernable and resurgent theme of harnessing national partnerships. Any nation that moves even part way down the track of improved innovation eco-system cooperation stands to gain a true competitive edge in global markets.

While current Innovation policy initiatives are implemented with strong focus, professionalism, and conviction, Canadian policy makers must continue to cast an eye forward to the longer term economic battlefield. Similar to many military offensive principles, Canada must keep moving!

One of the most critical areas where Canada should look forward is science and technology convergence (Convergence). Convergence is not simply multi-disciplinary R&D in action. It is a mode of R&D that unleashes the knowledge, expertise, and skills of individuals from diverse backgrounds, as well as infrastructure, around an identified challenge while checking the notion of academic domains at the door. Removing the notion of academic domains facilitates improved cooperation and collaboration through minimizing the risk of culturally-based impediments to progress. Primary emphasis is on the value of thinking, not on individual domains be they rooted in natural or social sciences, or engineering.

Canada needs to forge true national partnerships along Convergence lines in order to compete successfully in the new global economic battlefield. Our nation is now witnessing sustained international efforts to understand and harness Convergence. It will be the new economic battlefield. The US and Europe are setting the pace with key lessons being learned and key insights being gained. In effect, national competencies are slowly and methodically being built to overcome a broad range of challenges around Convergence. The most immediate of these include how to bring together diverse cultures and knowledge bases; how to manage massive amounts of data (e.g. access, ownership, processing); how to build true teams and partnerships; how to manage high associated costs and risks; and how to reduce administrative barriers such as organizational structures and human resource policies that do not explicitly recognize Convergence. Of note, the US National Academy of Sciences (NAS) has called for a nationally coordinated effort to build infrastructure required for Convergence.

Genomics, the combination of genetics, chemistry, optics, and bioinformatics, is an excellent example of the importance of Convergence. It demonstrates how this mode of research and development can lead to entirely new S&T domains that represent key platforms to secure global markets and to generate innovative solutions to complex economic and social issues. Akin to the theme of Genomics, it is not surprising that MIT views Convergence as a blueprint for innovation. In the long run, perhaps we are beginning to understand the innovation genome - innovation at a DNA level.

Imagine if our Nation had failed to mobilize around the emergence of Genomics in the 1970s. Canada would likely be on the sidelines of a fast-growing global market that is expected to hit \$19 billion in revenues by 2018, one that brings an array of resounding social impacts ranging from health care to law enforcement.



And what of Canada? To begin, strategic investments have continued in the nation's innovation eco-system over the past two decades. This bodes well. Our nation boasts world-class universities and colleges that are true sources of knowledge and highly educated and skilled personnel in the natural and social sciences, and engineering; leading-edge S&T infrastructure such as accelerators and incubators; very successful, motivated, and integrated communities focused on the power and value of innovation ecosystems such as Waterloo and Charlottetown; a world-leading marketplace framework to promote fair and efficient competition; and first-class policy-makers, politicians, business people; and financiers - a rich basis for Convergence.

But is this Convergence in its own right? No. Convergence is non-existent without focused cooperative action. Individual parts of the Canadian innovation eco-system are definitely contributing at the leading-edge. But is the whole reaching its potential? Is Canada truly positioned to thrive in an era marked by Convergence?

So what comparative advantage does Canada have that would serve us well on the Convergence battleground? What would give Canada a sustainable edge? I believe it is our nation's inherent ability to come together to cooperate in the face of truly urgent challenges. Canada needs to nurture and exploit this comparative advantage - a naturally endowed asset not easily accessible, or impossible to access, by competitor nations. Comparative advantages are, by their very nature, more difficult for competitors to replicate. This allows for a sustained value capture. Competitive advantages on the other hand face the challenge of fleeting advantage as they are more easily replicated in time. Blackberry and Nortel serve as useful examples.

So, what does this mean for Canada? The need for leadership marked by courage, fortitude, and the skills to forge a comprehensive federal/provincial partnership - a true national partnership - on Convergence to protect long-term Canadian socio-economic interests. A national rather than federal innovation strategy would be a good starting point and is likely a prerequisite for success. Canada should borrow from the Taiwanese play book. We must surpass other nations through our sheer will and hunger to compete, to maintain our position, and even expand it. This calls for national leadership.

For Canada, Convergence is not a question of good fit. It's a necessary fit. Smart pace. Long view. Focused and sustained effort. A national agenda. And true leadership.

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