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## Calling for a Bold Approach to Innovation

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By Dr Wendy Cukier

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For 20 years we have been talking about innovation. Our global rankings have slipped, our productivity is falling compared to the US and we know there are no simple solutions. Some say that universities cannot drive the innovation ecosystem and that industry needs to increase Business Enterprise R&D (BERD) which has never recovered from the loss of Nortel and its multiplier effects.

Most insist that in spite of the uneven results, investments in basic research and science are critical because one cannot anticipate the trajectory of innovation or “pick winners”. As Nobel Prize winning physicist John Polanyi once famously noted, a breakthrough in fundamental research – lobster ophthalmology – transformed the manufacture of silicon chips. The eyes of lobsters served as the model for a new approach to focusing light - lobster-eye optics. Who knew? These perspectives are without question important.

Many themes recur over the last 20 years – in *Preparing Canada for a Digital World* (1997), *Canada’s Innovation Strategy* (2002), the *Canada’s Innovation Strategy: A Call to Action* (2011) — yet our rankings continue to slip. While consultations ensure multiple perspectives are considered, we need rigorous analysis and a bold new action-oriented approach to the innovation agenda with clear targets. Otherwise we keep having the same conversation over and over again. Complex processes are not easy to understand, predict or measure and we need space to try to fail and to iterate. But we do need action. There are four areas I think should be highlighted.

### **What is innovation?**

First, start with a clear definition: It may seem self-evident but innovation is not the simply the creation of something new — a new process, or technology or product. Innovation is the **doing** of something new. Whether we look at business operations, health care, green technology, public services or virtually any sector, the challenge is less often the absence of workable technological solutions than it is the failure to adopt those solutions effectively. Canada has developed lots of breakthrough technologies and innovative processes. Our problem is that they are not being used effectively to drive innovation, or to fuel economic and social development. And remember that not all innovation is based on technology. Disruptive business models drove the growth of Uber and Airbnb, their underlying technologies were mundane.

### **Advance social and economic goals**

Second, add an explicit emphasis on driving the adoption of new technologies, products and services to advance economic and social goals. The federal government, for

example, is passionate about advancing green technology. But if the technology is not actually used it will have no impact. There are thousands of small green tech startups in the province of Ontario with amazing new approaches to harnessing solar power or to water purification. But if consumers keep consuming as they do, if companies have no incentives to invest and utilities see no need to change, they are for naught. Ontario has more than 400 water technology start-ups yet 30% of Aboriginal communities have boil water advisories. The challenges are clearly not just about the technologies. In order to develop an innovation strategy that works, we need to have a rigorous understanding of how these large systems work and do not work. And we need to remember that innovation is not just about the Toronto-Waterloo corridor.

Consider health care. The American Medical Records Association reported “obstacles to the practical use of the computerized medical record exist, but we may expect these to vanish within a few years. We have a golden opportunity to avoid a new round of medical costs.” That was written in 1990, Almost 30 years later our progress has been tragically slow impeded by political, organizational and behavioural barriers, particularly among physicians. Of course, it is important to push the envelope on genomics research and on new drugs and on better understanding the biological basis of destructive human behaviours such as smoking and inactivity (the new smoking). But equally important is understanding the systems that reinforce poor choices, the impact of advertising, for example, and the ways in which policy and regulation, education and nudge technologies can shape behavior particularly with at risk populations. While there is some evidence of shifting approaches, the health care innovation discussion still tends to be fixed on investing in science and technology with insufficient attention to the broader context.

Pushing the boundaries in information and communications technology has the potential to create fast growing companies and to transform virtually every sector. But understanding markets and adoption is fundamental. We are the most connected consumers in the world, but business is risk adverse and, as the president of Google Canada said, we are “bad slow” in the adoption of technology. The Ontario Chamber of Commerce indicates that 40% of small and medium enterprises (SMEs) do not even have an Internet presence. How can we change that? What strategies produce results?

Can government and corporate procurement be used as a strategic tool?

These are huge issues that need to be addressed with rigorous research and intentional strategies. And, when we talk about disruptive technologies, the cry for better understanding of drivers and impediments and impacts is even more pressing. In *The Future of Employment*, Carl Frey and Michael Osborne predicted that 47% of jobs in the US might be lost as a result of technological innovation over the next 10 years. The potential for disruption is massive and the need for study, for planning and for policy development is critical. But the engineers and computer scientists who are building the new Artificial Intelligence Data Analytics Bots are ill equipped to assess potential impacts.

### **Include the public sector**

Third, an innovation agenda must include the public sector. Ministries, universities and most public institutions are by definition bureaucracies designed to preserve tradition and the status quo. Given their massive and important investment (over 40% GDP) in Canada, the substantial economic impact it has, and growing demands, the long-discussed transformation of government needs to be very high on the innovation agenda and with it social innovation.

As the Public Policy Forum has noted, we need more agility, smart risk taking and better utilization of resources. We need to unleash creativity, new partnerships and effective use of technology to govern and serve better. The potential to literally unlock billions upon billions of taxpayer's money for reinvestment needs to be a top priority. Another critical issue. Another grand challenge.

### **Social sciences and humanities matter**

Finally, underpinning all this is the understanding that science, technology, engineering and math (STEM) are necessary but insufficient to drive innovation. Of course we need to support STEM research and commercialization (perhaps with additional focus on

commercialization) but that will not drive innovation. Investments in humanities and social sciences are not just important to create a critical thinking, well rounded citizenry (a view to which I subscribe) but absolutely fundamental to driving innovation. Social sciences and humanities researchers are a critical part of an innovation agenda. They explore consumer and organizational behavior, the drivers and impediments to change. They examine the impacts and unintended consequences and who is included and excluded, what works and what doesn't work. They help us understand the limits of rational/functional behavior and the role of identity and aesthetics in shaping choices.

Does anyone think that the iPhone's success is based purely on functionality? Steve Jobs was a social scientist, a proponent for beauty in design. Social science and humanities researchers help navigate legislative and regulatory hurdles. They help create compelling narratives and content. These disciplines are often paid lip service but seldom prioritized in research investments — witness their virtual exclusion from the \$1.7 billion Canada Research Excellence Fund. And in Ontario nearly every cent of the Ontario Research Excellence Fund (ORF-RE) goes to STEM research with the unintended consequence of almost 90% of the funding going to men. But including social sciences and humanities research is not fundamentally about equity or fairness it is about developing an effective and inclusive innovation agenda.

We have had a series of Innovation Strategies developed over the last 25 years and each successive one has mostly just reframed the last one. If we continue to do what we have done in the past and expect different outcomes, we are deluded. The rate of change over the next five years is going to make the last decade look like slow motion. Innovation is about doing things differently — this time around we also need to do innovation differently.

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**Geoff Foulds**

CMO at affiniD

... 5mo

Super article. One nitpick: there's a spectrum of risk tolerance. Do many Canadian companies cluster at the risk adverse end? Yes. Are there are exceptions? Yes. I believe that the part of what we must do to move forward is to study how those exceptions do it, and support those willing to learn.

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**Musabbir Chowdhury**

Productivity and Innovation Consultant, Professor of Business, and Entrepreneur

... 6mo

Great article. Our national productivity is in decline since early 80s, and ICT adoption/integration/alignment are one of key challenges are our SMEs are facing. We need a new strategy and also need to focus on execution of that new strategy.

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