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Expert Review Panel on Research and Development
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Dear Mr. Jenkins, Dr. Dahlby, Dr. Gupta, Ms. Leroux, Dr. Naylor, and Mrs. Robinson:

Thank-you for devoting your energy towards Hon. Gary Goodyear's Expert Panel to enhance the federal government's research and development initiatives. The following opinions represent my reflections as a lay researcher and entrepreneur in Canada.

Summary

I have had the most success with government initiatives that are Simple, Predictable, Regulated, Open, Useful, and Timely. They help a venture SPROUT. In terms of resource allocation, I believe that research and development initiatives should strive for the smoothest innovation continuum between the most theoretical research and the most applied implementation. Innovators are most effective when there is just the right balance of quality collaborators with whom they can work at slightly more theoretical and slightly more applied levels.

Submission

Part I: Some thoughts from recent experiences as a lay entrepreneur and researcher

Since graduation in 2007, I have participated in programmes by MITACS (Mathematics of Information Technology and Complex Systems), SR&ED (Scientific Research and Experimental Development), NRC (National Research Council) and NSERC (National Science and Engineering Research Council), in addition to initiatives by the BCIC (British Columbia Innovation Council), such as the New Ventures BC Competition, and by DFAIT (Department of Foreign Affairs and International Trade), such as the Canadian Accelerator in Silicon Valley, California.

The benefits of these initiatives are often difficult to quantify or describe. These initiatives collectively nurture Canada's innovation network. I urge the government to focus its evaluation of these initiatives by how well each initiative improves our long term socio-economic innovation network, not by tallies of short term economic successes.

Attributes that have helped recent collaborations SPROUT are...

Simple. The goals and application procedures are succinct, yet effective. For example, MITACS-Accelerate and NSERC Canadian Collaborative Research Experiences for Undergraduates have short, easy-to-understand application procedures. A knowledgeable representative is available to discuss the appropriateness of a proposed initiative *before* submission of an application. These short pre-submission dialogues help a potential sponsor define a suitable research project, or suggest alternative initiatives.

One could possibly replace some complicated grant initiatives with simple credit initiatives. Staff who would normally review the grants would then be free to spend more time communicating with researchers and developers.

Timely. Business innovation does not necessarily follow a yearly government fiscal cycle. When our first company was 1 month old, we did not have 8 months to wait for a possible market research grant that may have offered support over a slow 4 month process. Initiatives such as NSERC Engage and MITACS-Accelerate typically process applications in a few weeks and can be submitted any time.

Predictable. Initiatives like SR&ED have very well defined rules. The United States has initiatives such as Defense Advanced Research Projects Agency (DARPA) within its industrial military complex system. In Canada, initiatives such as SR&ED are important civilian innovation grant initiatives that provide similar benefits as the American industrial military complex. Similar to the effective NSERC review process, proper SR&ED evaluation focusses on the quality of the application with little attention to subjective value judgements.

Open. Evaluation should focus on the quality of the application. Unqualified "friends and family" nominations were virtually non-existent within the DFAIT and BCIC initiatives in which we participated. For example, trade commissioners from DFAIT appeared to genuinely scour the country for entrepreneurs who met their criteria.

Regulated. Recent reports suggest some problems invigilating rules within the SR&ED initiatives. The SR&ED concept is excellent. Instead of trying to overhaul a generally effective system, I hope administrators adopt a more effective enforcement strategy.

Useful. I encourage the government to think of creative ways to support useful long term initiatives that generate benefits dispersed across industry sectors and geography. Such initiatives are often difficult to communicate to voters within a short political cycle, yet they are very important. For example, although my particular stint within DFAIT's Canadian Accelerator in Silicon Valley, California was not a commercial success for our start-up company, I have already lost count of the times when I have shared useful experiences from the Canadian Accelerator with new entrepreneurs in Canada.

Part II: Some thoughts for leveraging Canada's resource sector

How can the government encourage more knowledge transfer *between* industry sectors? For example, Brent Holliday at Capital West Partners often points out that the venture capital industry in Canada is still emerging for sectors like high-tech services, but successful precedents exist in the resource sectors. Many of the risk-reward strategies for oil, diamond, or gold exploration are conceptually similar to the risk-reward strategies involved in finding the next "killer app"in the social media space.

Figure 1 illustrates some innovation experiences while working in Canada (and reflected upon while working in the US and Europe). The solid blue "effective" line shows my experiences working in the Forestry sector. The dashed red "ineffective" line shows my experiences working in the Manufacturing sector. The Forestry sector has effective numbers of qualified people engaged at every stage across the *theoretical research - industrial application* continuum. For example, I have had the opportunity to work alongside mathematicians who have thought of innovative processes to maximize pulp and paper usage, tree planters, and everyone in between. Crucially, a deep web connects individuals across the continuum to support world class innovation.

Conversely, my experiences in the Manufacturing sector are more like the dotted red "ineffective" line in Figure 1. Applied research colleagues performed world class research with the help of initiatives like NSERC and NRC. However, communication with theoreticians could be improved, and we often ended up collaborating with industry partners in the US, Europe, and Asia such as Boeing, BMW, and Sony. We typically failed to collaborate with Canadian companies because a hole existed in the innovation continuum between applied researchers and manufacturing line practitioners. For example, Ontario has a large automotive industry (shown as a bump at the right of Figure 1), but most of the applied industrial research is performed in other countries (e.g., automotive research centres in US, Europe, and Asia). Naturally, we should leverage manufacturing exceptions, such as Bombardier.

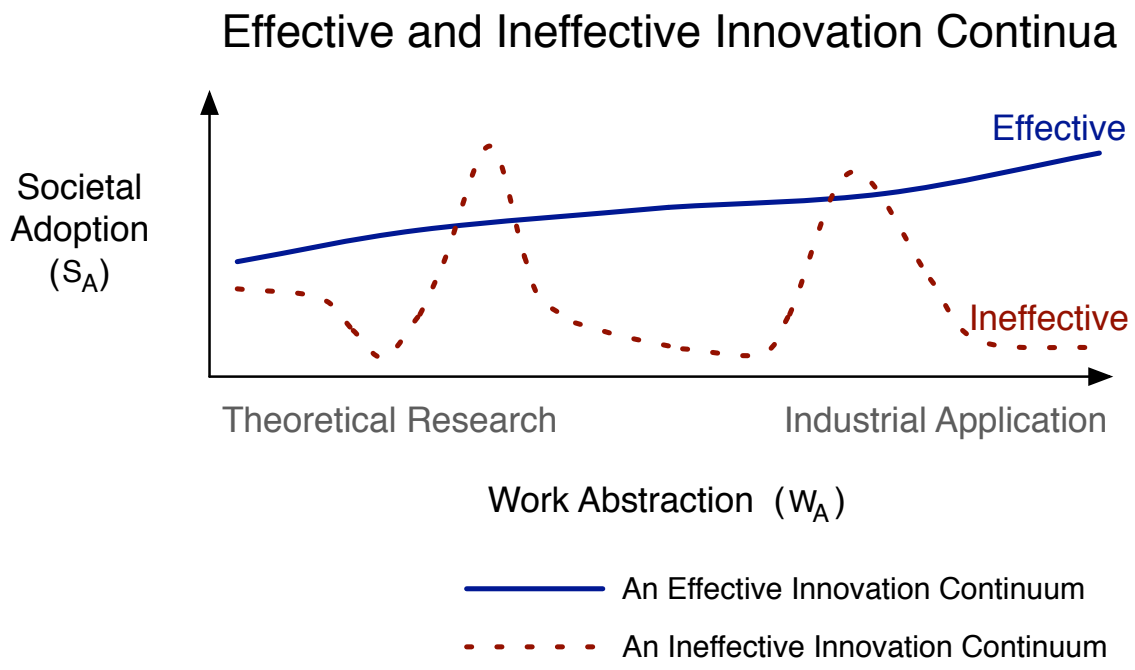

Figure 1: *Effective and Ineffective Innovation Continua*

Conclusions

In summary, the following three enhancements could help research and development: 1) Encourage dialogue *between* sectors through the myriad of existing successful initiatives, 2) Improve efficiency and objectivity of existing initiatives, and 3) Revisit the *actual* footprint of initiatives on the *theoretical research - industrial application* continuum.

I can be reached via e-mail at colin.swindells@gmail.com or via phone at 250.480.5025 to further discuss these topics in detail. I look forward to hearing the results of the panel.

Sincerely yours,

C. Swindells

Colin Swindells, Ph.D.