

# INNOVATION AND PRODUCTIVITY: THE NEED FOR AN INTELLECTUAL ARCHITECT

E. Richard Gold

From a productivity standpoint, “innovation is innovation,” writes Richard Gold of McGill University’s Centre for Intellectual Property Policy. “It matters little whether it is homegrown or foreign. Markets for innovation are international and many forms of innovation cost nothing to transport,” he says, software being a prominent example. Because the Canadian market is so small, it is hardly worth the trouble for innovators to patent their work here. But Gold also sees an opportunity. “Canada,” he writes, “should develop an intellectual property policy that lowers the cost to those conducting research and creation in Canada, making Canada an attractive location for investment in high technology industries.”

Du point de vue de la productivité, « l’innovation est profitable en soi », écrit Richard Gold, du Centre pour la propriété intellectuelle de l’Université McGill. Et « il importe peu qu’elle provienne d’ici ou de l’étranger. Le marché de l’innovation est international et de nombreuses formes d’innovation ne coûtent rien en transport », les logiciels par exemple. Étant donné l’étroitesse du marché canadien, les innovateurs jugent rarement intéressant de faire breveter ici leurs découvertes. Mais l’auteur y voit aussi une occasion à saisir : « Le Canada devrait se doter d’une politique de propriété intellectuelle prévoyant une réduction des coûts pour ceux qui mènent leurs recherches au pays, ce qui ferait du Canada un endroit plus attirant pour investir dans les secteurs de haute technologie. »

**T**oo often we confuse productivity, innovation and intellectual property as if one necessarily depended on the others. The reality is quite different. Productivity does not depend on Canadian innovation and Canadian innovation does not depend — at least not in the way most people think — on the main form of Canadian industrial property: patents. What all depend on is something quite different: an intellectual architecture, which is the set of rules and practices that surround the development and use of knowledge that suits the Canadian environment.

As the Bank of Canada has noted: “Canada has a long-standing productivity gap relative to the United States and, with the slowing of Canadian productivity growth in recent years, this gap has widened.” Part of the reason for the productivity gap is certainly the lack of innovation being brought into Canadian firms. But the culprit is not the lack of Canadian innovation but the fact that Canadian companies have been able to get away with not investing in buying innovation. From a productivity point of view, innovation is innovation: it matters little whether it is homegrown or foreign. Markets for innovation are interna-

tional and many forms of innovation cost nothing to transport — think only of software — so even price and availability depend little on who developed the innovation. More important has been, until recently, the low Canadian dollar and high commodity prices that have allowed many a Canadian firm to avoid paying for technology while still being able to compete globally.

Linking Canadian innovation with the strength of Canadian intellectual property rights — despite being often repeated — simply ignores reality. Except in those industries which are uniquely Canadian or in which the Canadian environment is so different that solutions that work abroad will not work here — and how many of those are key to future Canadian growth? — Canadian innovators will always prefer to sell in the world’s major markets: the United States, Europe and Japan. It is in these markets that Canadian companies will pursue their patent rights, not in Canada. This is why Canadians prefer to patent abroad instead of in Canada. This makes perfect business sense and, more importantly, provides Canada with an important uncompetitive advantage in comparison with its bigger neighbour.

Unfortunately, this simple reality is poorly understood, so it is worth expanding on it. Patents provide actors with the ability to prevent oth-

The aim of patent laws is to balance the positive, innovative, effect of these systems against their costs. Thus, we try to give enough rights to push

conducting research and creation in Canada, making Canada an attractive location for investment in high technology industries.

**What Canadian policy-makers and advocates of the patent system too easily ignore, however, is that the story does not in fact play out this way in Canada. Because the Canadian market is so small in comparison with those of the United States, Europe and Japan, it is practically irrelevant in providing returns to innovators. Any change to Canadian patent laws will have at most trivial effects on returns on investment. Canadian firms recognize this fact: many companies are willing to completely forego their Canadian patent rights, since the time and cost of obtaining them cannot be justified given the small size of the Canadian market.**

ers from using, making or selling an invention for 20 years. Countries grant these rights since they permit actors a period of market exclusivity during which they can attempt to sell products and services in the absence of free-riders. How much money an actor actually makes from these rights will depend on a number of factors including the quality of the invention, the management skill of those directed operations, market conditions, substitutes in the marketplace, cost and available distribution channels, among others.

**P**atents come, as do most things, at a cost. The cost is that during the period of exclusivity, nobody else is permitted to make use of the invention without the approval of the rights holder. This consent usually comes for a fee and takes time to negotiate. Thus, third parties who may be able to make as good or even better use of the invention will at least be delayed or perhaps entirely prevented from so doing. While the market in theory should clear these rights through appropriate determinations of price, markets are far from perfect. Controversies over Internet downloading, access to essential medicines and the availability of genetic tests for diseases such as cancer illustrate this point only too well.

innovation by rights holders but not so many to prevent use of that innovation (including using the innovation to improve on it) by third parties. So far, the story is fairly traditional.

What Canadian policy-makers and advocates of the patent system too easily ignore, however, is that the story does not in fact play out this way in Canada. Because the Canadian market is so small in comparison with those of the United States, Europe and Japan, it is practically irrelevant in providing returns to innovators. Any change to Canadian patent laws will have at most trivial effects on returns on investment. Canadian firms recognize this fact: many companies are willing to completely forego their Canadian patent rights, since the time and cost of obtaining them cannot be justified given the small size of the Canadian market.

Far from decrying this — as many in the intellectual property field do — Canada should celebrate it. This is because this situation provides Canada with the unique opportunity to lower the costs of innovation for companies operating in Canada. Because Canadian patent laws do little to encourage innovation and creation, Canadian patent law should focus on the second part of the equation: that of costs. Canada should develop an intellectual property policy that lowers the costs to those

If Canadian patent laws are such that, for example, Canadian universities and firms can freely conduct research without having to manoeuvre their way through licence negotiations and royalties, we can expect more investment to take place in Canada. As long as Canada abides by international trade agreements — and this is not a problem even if it changes its patent and copyright systems — Canadian firms will have equal access to US, European and Japanese markets as their (higher cost) competitors in those countries.

This counter-intuitive result points to a bigger problem in Canadian policy-making: the absence of a contextual understanding of how innovation, research, intellectual property, and the institutions and people responsible for them, actually work. As Alan Cornford and Stephen Murgatroyd suggest, Canada needs to understand the “eco-system” of innovation. They point to some aspects of this eco-system, such as stable funding for university research, the production of skilled graduates, university technology transfer as well as private investment in research, all of which in Canada lag far behind international norms.

While the eco-system metaphor certainly has the advantage of highlighting the inter-relationship among university research, private sector investments and training, it fails to appropriately underscore the role of policy-making in the area of innovation and intellectual property. Let me propose a different metaphor: that of intellectual architecture and the policy-maker as intellectual architect.

Just as physical architecture encourages or discourages the flow of people, creates quiet places of contemplation and hustling hubs of activity,



Claudio Calligaris, McGill University

**Student Frederick Robidoux in a lab at McGill University. University-based research is a vital aspect of innovation and, writes Richard Gold, “a country can significantly increase its level of innovation if it is able to attract graduate students and other skilled immigrants with science and technology backgrounds.”**

leads to a feeling of well-being or of stress, so too a country’s intellectual architecture encourages or discourages the flow of knowledge, creates places where ideas form quietly and others where innovation bubbles forth endlessly and leads or does not lead to new products and services. A place’s intellectual architecture includes not only its innovations, but also the foundations that ensure their free flow, such as licensing arrangements, funding mechanisms like government grants and tax rules, technology clustering, universities, immigration rules, and training of technology-related business managers.

**C**onsider just three elements within this architecture: the country’s

reputation for innovation, universities and high-technology its researchers and its workers. As Chellaraj, Maskus and Mattoo have demonstrated, a country can significantly increase its level of innovation if it is able to attract graduate students and other skilled immigrants with science and technology backgrounds. Given Canada’s lack of skilled workers in these fields, attracting them from abroad is particularly important to the future of Canada’s innovation systems. Now is a particularly good time to do so. As the United States clamps down on the number of visas it provides to doctoral students and post-doctoral fellows. Canada could take advantage of US policy to attract more of these foreign students here, as the United Kingdom is doing.

Thus, a Canadian policy-maker wishing to attract these skilled employees must not only look at Canada’s immigration rules, but at its reputation for science and technology among those who may be contemplating studying or moving to Canada. Canada’s “brand” in this area will depend on a number of factors, including the presence of technology-related firms in the country, internationally known examples of Canadian technology, and the reputation of Canadian universities abroad. Graduate students in particular are influenced by the reputation of Canadian universities, and yet Canada does relatively little to promote (and even sustain competitively) its top research universities.

An intellectual architect would attempt to align Canada's ambitions toward innovation — presumably to create and maintain a large number of high-income jobs in Canada and attract tax revenue from high-tech companies — with its architecture. If such a person took Canada's need for skilled workers (or international investment) seriously, he or she would understand, for example, the importance of Canadian universities to Canada's long-term goals. This would lead not only to long-term, substantial and stable funding of Canadian universities, but also to a particular emphasis on those universities with a strong international reputation for research.

This same intellectual architect would likely also be concerned about how to move ideas from those who have them to those who use them. Contrary to what Cornford and Murgatroyd maintain, the key here is not more technology transfer, but the development of greater

cooperative mechanisms between university and industrial researchers and managers. Knowledge and innovation do not actually move one way, from universities to industry; in fact, knowledge moves back and forth as ideas are put forth, critiqued, improved upon and honed for particular situations. A wise intellectual architect would concentrate more on ensuring that knowledge moves, rather than on the form — technology transfer — that that movement takes. We know, for example, that the vast majority of university researchers transfer their knowledge through such cooperative mechanisms as joint research projects, the placement of post-doctoral fellows, conference exchanges and so on, rather than through formal intellectual property rights or licensing arrangements. Creating opportunities for informal knowledge transfer — meaning that universities should not rely too heavily on patent rights — is best to advance innovation within the country.

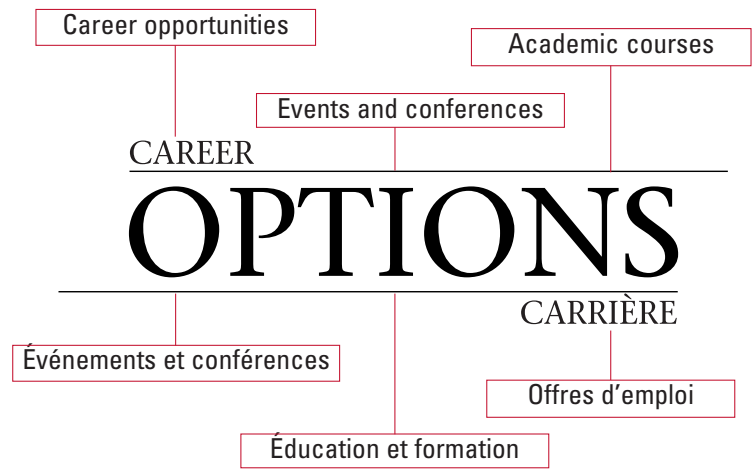
Innovation cuts across all government departments and areas of concern. The few examples given above cut across government responsibilities for science and technology, intellectual property, universities, immigration and international affairs. Intellectual architecture cannot, therefore, be left to the bureaucrats alone: it must take direction and coherence from the political level.

While the government can give policy coherence to Canada's intellectual architecture, it will have to work with industry, universities and other actors who create, disseminate and use innovation. In the end, however, only a concerted effort by government — and at the highest levels — can lead the public and private sectors in addressing Canada's productivity gap

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