

Open Innovation: Issues and Challenges for Québec

Summary

2009 Situation Report

Conseil de la science et de la technologie

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Open Innovation: Issues and Challenges for Québec 2009 Situation Report Summary

In response to the mandate entrusted to Conseil de la science et de la technologie by the Québec Research and Innovation Strategy (QRIS)¹ and as part of its updating, the 2009 edition of the situation report examines Québec's situation regarding open innovation, a current major world trend.

Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation.² These new practices result in more interaction between players. Initially applied to large corporations, the model is steadily winning over other businesses and now raising questions about each component of the national innovation system (NIS) and its ties with international players.

Open innovation practices are challenging the linear model of innovation, on which current policies are largely based, and presenting a much more dynamic, complex, fluid, and iterative vision. Open innovation is a “contact sport,” where demand and the market play a key role — a process driven both by demand (demand pull) and advanced technology (technology push).

The benefits for businesses are numerous: greater access to knowledge and know-how, faster innovation processes, opportunities to undertake priority R&D projects for which there are insufficient inhouse human and financial resources, better risk-sharing in uncertain, rapidly changing markets, the creation of knowledge clusters that bring together a critical mass of investments and more internationally competitive players, cost reduction, shorter lead times, etc.

These practices based on openness and cooperation also have pitfalls and new risks: complex agreements and negotiations regarding intellectual property rights (particularly between businesses and institutes of higher education), the burden and extra costs of cooperation projects, transparency requirements, the imbalance of power between major contractors and smaller businesses, the lack of intellectual property management skills in SMEs, the lack of recognition of collaborative research activities, etc.

The global economic slowdown is taking its toll on Québec and other pressures are being added, such as changes in knowledge production, globalization, a high Canadian dollar, and competition from emerging countries. These extra pressures may weaken its global competitiveness, with sectors like manufacturing and natural resources being particularly affected.

¹ Conseil de la science et de la technologie has been tasked with conducting an annual followup and reporting on Québec's results in research, science, and innovation. It must also ensure that the government is informed of new issues and emerging problems. See MDEIE. *Un Québec innovant et prospère. Stratégie québécoise de recherche et d'innovation* (Gouvernement du Québec), 2006, p. 65.

² H. Chesbrough. *Open Innovation: Researching a New Paradigm*, 2006, <http://www.openinnovation.net/>.

Open innovation can therefore strategically boost Québec's productivity and global competitiveness and contribute to sustainable economic and social development. To accelerate innovation and productivity growth, the Council invites the Minister of Economic Development, Innovation, and Export Trade to mobilize Québec's resources to focus on a shift toward better innovation practices adapted to Québec's situation (diversified economic sectors, mainly SMEs, public universities, etc.).

ADAPTATION OF INNOVATION POLICIES AND SUPPORT PROGRAMS

The Québec Research and Innovation Strategy must be enhanced with open innovation and implicate, where required, education, immigration, foreign investment, and international scientific cooperation policies, as well as provide support to SMEs and entrepreneurship.

The Council considers that innovation funding and support programs must be adapted accordingly, taking into account the specific features of Québec's major economic sectors and providing greater support for innovation measures, which have received little support to date.

Based on Québec's results in research, science, and innovation and available indicators, the Council proposes an exploratory view identifying a dozen challenges that open innovation poses. These challenges, which refer to the QRIS priority areas, are accompanied by a certain number of avenues for intervention that will successfully help confront them.

CHALLENGES AND INTERVENTION STRATEGIES

Public Research

Past experience has shown the benefits of sector-based public-private research cooperation mechanisms geared toward private business needs, from shared common goals to fast and flexible interaction, such as the Consortium for Research and Innovation in Aerospace in Québec (CRIAQ), the Mineral Exploration Research Consortium (CONSOREM), and Partnerships for Research on Microelectronics, Photonics, and Telecommunications (PROMPT). These alliances lead to the creation of veritable knowledge clusters and international centers of excellence. The first action proposal is as follows:

1. Strengthen or set up flexible, sector-based public-private research collaboration mechanisms geared toward private business needs in Québec's major sectors of excellence, ensuring that support measures allow SMEs to participate effectively.

Intellectual property management is a major issue and irritant for collaborations between the various circles, whether public or private. Action has been taken to facilitate negotiations and encourage collaboration, notably in consortiums, but difficulties persist. A change in culture is required in the approach to this type of management. The second action proposal is as follows:

2. Create a consensus-building forum on intellectual property that is tasked with making recommendations to the Minister of Economic Development, Innovation, and Export Trade regarding the most promising avenues for improving current intellectual property management practices, particularly in a context of public-private collaboration.

The main contribution to knowledge transfer of institutes of higher education is their training of a highly qualified workforce. Too few training programs are adapted to business innovation needs, yet training is a key factor in businesses' ability to innovate. Inspired by the best practices developed in Québec and elsewhere in the world, the third action proposal is as follows:

3. Lend more support to business partnership initiatives at all education levels that focus on:

- Training a highly qualified workforce sufficiently prepared for business innovation;
- Quickly integrating graduates into the workplace.

Industrial Research and Business Innovation

The opening up of innovation processes and knowledge markets provides many business opportunities to enterprising medium-sized companies (100 to 500 employees) that are well positioned on the market, particularly companies with value-added services. However, this opening up requires them to face off with more powerful players and guard against idea theft. It is therefore important to help them face these added risks. The fourth action proposal is as follows:

4. Adapt business innovation support programs to allow competitive SMEs (including companies with value-added services) to become more integrated with global value chains through:
 - Strengthening of their preferred networks;
 - Better positioning vis-à-vis major contractors;
 - A greater ability to manage their innovation processes and intellectual property.

Small businesses (50 to 100 employees), which make up 90% of Québec's industrial structure and a large part of which are in the traditional manufacturing and resources sectors, are still a long way from opting for innovation. The fifth action proposal is as follows:

5. Adapt innovation support programs in SMEs to speed up adoption of innovation and networking practices by the smallest among them, and help them set up common training and marketing structures where effective.

In open innovation practices, demand often plays a crucial role. This is particularly the case in regulated sectors, such as health and environmental technologies, where demonstration processes are longer and may be facilitated by partnerships with major public and private users (role of technology showcase and business platform). Public-private partnerships (lead users) are a tool that is underused in Québec in comparison with other countries. It would be advisable to use it more to stimulate demand for

innovative products and services, in accordance with trade agreements. The sixth action proposal is as follows:

6. Create incentive programs aimed at developing public markets and the markets of major users as driving forces of innovation (support for demand) and facilitating the setup of Québec technology showcases with international visibility.

Business creation and entrepreneurship are traditionally considered one of the main drivers of innovation. Consequently, developing entrepreneurship is a priority of economic policies around the world. The space that Québec will be able to carve out for itself in an innovation system that is increasingly more open to the world largely depends on preparing a future generation of entrepreneurs that are dynamic, sensitive to social concerns, and able to deal with stiff competition. It also depends on the presence of employees in the various circles with a more entrepreneurial attitude similar to that of business creators. The seventh action proposal is as follows:

7. Strengthen support for entrepreneurship in education programs and for future and new business managers.

Development, Transfer, and Intermediation

As part of a more open model, the quality of interactions, their smooth flow, fast access to information and knowledge, and the development and sharing of collective tools are fundamental. Intermediation bodies are important liaison agents between players.³ In Québec there are many active organizations (college technology transfer centers, liaison and transfer centers, regional or sector-based associations and networks, development corporations, etc.) that can determine which knowledge has high value-creation potential, serve as liaison and brokerage bodies, and help businesses innovate.

The Council believes it is important to optimize intermediation bodies' contribution to establishing the best open innovation practices in businesses by:

- Encouraging them to network on a sectoral and regional basis;
- Increasing the effectiveness of these bodies, including that of college technology transfer centers, in weaker and less innovative activity sectors;

³ The role of intermediation bodies is to help businesses innovate by facilitating the sharing of information, knowledge, and resources between them (mainly SMEs) and institutes of higher education, government, and their business environment.

- Prompting intermediaries to be more responsive to market needs;
- Testing new electronic brokerage tools;
- Measuring overall intermediation system effectiveness.

More specifically, the Council suggests two action proposals:

8. Develop incentives to ensure better networking between intermediation bodies, including ACCORD niches in various Québec regions.

9. Regularly assess the overall performance of intermediation bodies and their financing methods respecting their contribution to the adoption of better open innovation practices in businesses.

The Civic Culture of Innovation and Governance

Opening up innovation processes provides an opportunity to test original and more participatory new approaches to major social problems, such as living labs, which allow users and citizens to actively take part in them. Québec aims at promoting these more dynamic approaches to innovation by adapting its public policies and intervention strategies. The tenth action proposal is as follows:

10. Promote approaches that help citizens and users play a more active role in creating and disseminating knowledge and products.

Opening up innovation processes also calls for the adoption of more participatory governance arrangements in all circles, including the government, the research community, businesses, intermediation bodies, the science awareness organizations, civil society, etc. Open innovation should increase interaction and collaboration between players and various circles and generate more opportunities for citizens and users to take part in it.

Foreign experiences show that, when determining research priorities, broadening participation to a variety of players helps build shared and highly mobilizing strategic intelligence. The eleventh action proposal is as follows:

11. Adapt governance arrangements in all circles to ensure they are more participatory in determining research priorities and guidelines.

To monitor changes under way in the adoption of new practices and measuring the effectiveness of exchange mechanisms and the performance of the entire NIS, Québec must develop appropriate indicators without further delay. The twelfth action proposal is as follows:

12. Develop appropriate indicators so that the effectiveness of the entire innovation system can be clearly assessed.

Lastly, to promote more open innovation and research practices, it is crucial to recognize, among the criteria for assessing the quality of the work and research track record of researchers, their contribution to exchanges with other players (dissemination and popularization activities, collaborative research, partnership transfer, development, and training practices, etc.). The last action proposal is as follows:

13. Adapt the researcher recognition mechanisms to include active researcher participation in popularization activities, collaborative research, and other open innovation practices.