

INNOVATION IN SERVICES

SUMMARY

OBSERVATIONS AND RECOMMENDATIONS

Overview of objectives

This advisory report is further to the work conducted by Conseil de la science et de la technologie on the Québec innovation system. Its objective is to present an initial profile of innovation in the Québec service sector (private tertiary sector¹) and evaluate the role of public authorities in related policies. To this end, the report provides a summary analysis of the role and importance of services in the economy (chapter 1), then lists the distinctive characteristics and main components of innovation in the sector (chapter 2) and identifies the importance of services in innovation support policies (chapter 3).

1. Findings of the analysis of the characteristics of innovation in services

A better understanding of the subject

Although incomplete in many regards, particularly in its statistical coverage (lack of Québec data on certain aspects and inconsistent classification), the profile drawn up for this advisory report proved to be particularly useful in understanding what innovation in services truly meant, and especially what was unique about it.

1 According to the North American Industry Classification System (NAICS), the major industry groups in the service industry are the following: wholesale trade; retail trade; transportation and warehousing; the information and cultural industry; finance and insurance; real estate and leasing services; professional, scientific, and technical services; company and business management; administrative and support services; education services; healthcare and social assistance services; arts, entertainment, and recreation; accommodation and restaurant services; and other services.

***Innovative capacity
that is often
underestimated***

Among the principal findings to emerge from this profile, it was noted that the definitions, methods, procedures, and indicators used thus far to measure a business or an industry's capacity for innovation were first developed for the manufacturing sector and were therefore ill-suited to services. Although the differences between the two sectors should not be overstated, this situation generally results in an underestimation of the service sector's real capacity for innovation, especially in terms of measuring features and indicators that reveal technological innovation.

***The approach and
principle findings***

That said, it was the analysis of the broad features examined in this profile—internal and external factors of innovation—that revealed the distinctive characteristics of innovation in services. Also, examination of these broad features made it possible to evaluate the capacity for innovation of the main service sectors and—depending on the availability of data—compare Québec's performance with that of other countries and the rest of Canada. This overview led to the following main findings for each aspect or factor considered:

R&D

Little formal R&D

- Generally speaking, innovation is less focused on formal R&D in the service sector. R&D is often "scattered" and rarely organized within a distinct R&D unit. It is most often handled by flexible groups working together on common projects.

***Lower spending
than in the
manufacturing
sector***

- In all OECD countries, R&D spending in the service sector is generally much more limited than in the manufacturing industry. It averages about 17% of overall business R&D spending.

***Research volume
underestimated***

- Nonetheless, service sector R&D continues to be underestimated. The current definition of business R&D includes only scientific research and experimental development in the fields of engineering and natural science, which excludes all the research activities in social and human sciences associated with a number of services.

***Faster growth than
in the
manufacturing
sector***

- However, even using the current definition, R&D spending in most OECD countries has increased more rapidly in the service sector than in the manufacturing industry for about the last twenty years.

***Good performance
in Québec***

- With R&D spending in services representing approximately 35% of total business R&D spending, Québec boasts a much higher ratio than most OECD countries (an average of 17%). As in G7 countries, the trade and business service sectors are responsible for the bulk of R&D spending in Québec services (26% and 62% respectively). When all sectors are counted, three of Québec's top five for R&D spending are in services and account for 32% of total business R&D spending. Québec's R&D spending in trade, management consulting, and engineering and science account for over 40% of total R&D spending in Canada in these sectors.

Main weaknesses

- The transportation and warehousing and the finance and insurance sectors have undergone a sharp decrease in R&D spending in Québec in recent years. Proportionately speaking, transportation and warehousing R&D in Québec fell from 41% of the Canadian total to 10% between 1994 and 1999, while the finance and insurance sector dropped from 16% to 7%.

Technology Acquisition

The use of IT as another source of innovation

- A number of innovations by the service sector are not related to R&D, but stem from the acquisition of new technologies, notably information technology. As a generic technology, IT is more important than any other modern technology in the service sector and its use is critical to improving the sector's ability to innovate and spur productivity.

A situation comparable to that in Ontario

- Considering the rate of investment in machines and equipment in proportion to the GDP—a ratio commonly used to measure the adoption rate of new technologies—the situation in Québec appears generally similar to that in Ontario. In both provinces, such investment represents 8% of service sector GDP. In Québec, the information and cultural industries, transportation and warehousing, finance and insurance, and professional, scientific, and technical service providers are the biggest investors. These same sectors dominate in Ontario, with the slight difference that the professional service sector ranks fourth in Ontario but holds the number two spot in Québec.

Different data, the same picture

- The statistics directly concerning the degree of penetration of new technologies in business basically bear up the investment data. Professional, scientific, and technical service providers and the information and cultural industries are the biggest users of certain major IT applications, while the accommodation and restaurant sector most often brings up the rear.

Organizational Change

Closely tied to technological change

- Technological and organizational change are closely linked. It is a known fact that in order to be successful, new technologies must generally be accompanied by major changes in work organization. As such, the ability to introduce organizational change is generally considered one of the main characteristics distinguishing the most

effective—and often most productive—service companies from those with mediocre performance.

***Considerable
variances according
to the company's
size and sector***

- The results of a Canadian survey on organizational change, defined as "...the substantial improvement of organizational structures or the implementation of new management techniques," indicate that the general adoption rate of organizational change is 38% in service companies. However, this rate varies noticeably according to the company's size and sector of activity. Companies with 1 to 99 employees have an adoption rate of 41%, the rate in companies with 100 to 499 employees is 81%, and companies with over 500 employees can boast a rate as high as 90%. The sectors with the highest adoption rates are educational services (52% of companies), information and cultural industries (52%), and health and social services (50%). In contrast, the accommodation and restaurant sector (29% of companies), transportation and warehousing (28%), and the business management sector (21%) are those with the lowest rates.

Scientific and Technical Personnel

***Human resources:
the main factor***

- Innovation in services is largely dependent on human resources. Their skills are the main force behind innovation in a number of areas, and possibly the sole source of innovation in the heavily knowledge-centered "pure services." With the increasingly intensive use of IT in most services, the presence of a skilled labor force with the expertise to introduce, use, or adapt these technologies also represents a decisive factor in a company's capacity to innovate. Lastly, innovation in more "technological" services requires a skilled R&D staff, i.e., a labor force with the qualifications to develop new service products or new processes.

***An incomplete way
to measure***

- The ratio of scientists, engineers, computer specialists, and technicians to the total number of jobs is a popular way of measuring the importance accorded scientific and

technical staff (ST). This ratio is mostly useful for estimating the number of jobs in natural sciences and engineering (NSE) associated with R&D and technology acquisition, but overlooks other job categories that contribute just as much to innovation in services, particularly those in social and human sciences. Thus, for want of a more general measurement to take into account the particularities of innovation in services, this report provides data both on the presence of ST personnel (NSE jobs) and social and human science professionals (SHS specialists).

***No significant
difference between
Québec and Ontario***

- There is no significant difference in the percentage of ST personnel in the various service sectors in Québec and Ontario. Overall, ST personnel hold about 6% of total service jobs in Québec and 7% in Ontario. In the two provinces, the professional, scientific, and technical service sectors and the information and cultural industries boast the highest proportion of ST jobs (a total of about 55% for the two sectors in both provinces). Depending on the professional categories and taking into account the entire service sector, computer specialists and technicians hold the bulk of ST jobs in the two provinces (about 70%). Jobs in social and human sciences have been developing at the same rate since 1990 in both provinces, and today represent the same share of overall service jobs in Québec and Ontario (approximately 2%).

Main weakness

- The transportation and warehousing sector experienced the largest decline in scientific and technical jobs in recent years. The share of jobs held by ST personnel fell by four points in the last ten years, or from 7% to 3% between 1990 and 2000.

Commercialization and Exportation

***Exportation and
innovation***

- The liberalization of trade has generally spurred innovation. Freeing up the markets puts service businesses in a situation of heightened competition, which encourages them to step up innovation. Access to foreign markets also brings with it the availability of new

knowledge, innovative ideas and concepts, and new technologies.

***An underestimated
phenomenon***

- The General Agreement on Trade in Services (GATS) recognizes four modes of trade in services: transborder (services sold by one country to another), consumption abroad (services sold by a country to foreign consumers), commercial presence (services sold by a company with a physical presence in a country other than its own), and physical presence (services provided within a given country by foreign nationals). Currently, only the first two modes of trade are accounted for in official statistics, which minimizes the real prevalence of international trade in services (by approximately 40% according to the World Trade Organization).

Québec lags behind

- Unlike in many countries, services have remained virtually unchanged in the last decade as a percentage of Québec's total exports. Based on those modes of trade currently measured (modes 1 and 2), its share in total exports of services was only 12% in 2001, or a difference of 11% compared to the average share for services in North America (23%), and 7% worldwide (19%).

External Sources of Innovation

***Innovation: a
collective process***

- Research on innovation has drawn attention to a key point—the knowledge that innovation is first and foremost a collective learning process. In addition to drawing on their own resources (R&D, ST personnel, technology acquisition, and other internal sources of innovation), companies find other sources of ideas in their surrounding environment that enable them to acquire the knowledge they need to innovate. The density and variety of relations that they develop with those in their environment are major factors in their capacity to innovate.

The importance of sources of innovation

- European and Canadian surveys generally reveal similar findings on the importance service companies attach to outside sources of innovation. Customers or consumers are by far the source most appreciated by companies (for up to 75% of Canadian businesses, depending on the sector), followed by competitors (up to 60%), and suppliers (up to 48%). Conventions, meetings, trade fairs, and consultants play a lesser role as sources of information (up to 38%). Lastly, service companies generally do not often call on academic institutions or public and private research institutes to acquire the knowledge they need (up to 24%).

Legislative and Regulatory Framework

Two important issues

- Two major issues come to the fore when the legislative and regulatory aspects of innovation in services are tackled: intellectual property rights and, more generally, economic and administrative regulations.

The main means of protection used

- As innovation in services is often intangible in nature, it is difficult to protect. Surveys conducted in Europe and Canada reveal that the percentage of service companies that make use of intellectual property laws is relatively low compared to the manufacturing sector (a maximum of 40% for certain Canadian service sectors versus an average of over 60% for manufacturers). When calling on these laws, service companies use intellectual property and trademarks as their preferred forms of protection. Trade secrets are less widespread and represent companies' third choice, whereas patents are rarely used, except in "technological" services.

Main regulatory restrictions

- Economic and administrative regulations are the most likely to influence companies' approach to innovation. According to surveys conducted on innovation, businesses generally consider these regulations to be a major barrier to innovation. The main

restrictions associated with these regulations generally include the rigidity and complexity of the numerous administrative and regulatory procedures, delays in national regulations, market access restrictions, and regulatory restrictions on information technology.

**Classifying services
according to
internal factors**

Table 1. provides a general overview of the position of the main service sectors based on the five internal factors of innovation covered in this report. Professional, scientific, and technical service providers and the information and cultural industries are most often at the top of the list, while the health, social services, and accommodation and restaurant sectors generally bring up the rear.

TABLE 1. – CLASSIFICATION OF SERVICES BASED ON THE MAIN CHARACTERISTICS EXAMINED*					
	R&D Spending	Technology Acquisition	Organizational Change	ST Personnel	Exportation
Wholesale trade	2	8	4	4	...**
Retail trade	2	6	6	8	...
Transportation and warehousing	5	3	8	5	2
Information and cultural industries	3	1	2	2	5
Finance and insurance	4	4	4	3	3
Prof., scientific, and tech. services	1	2	5	1	1
Educational services	...	7	1	6	6
Health and social assistance	...	5	3	7	7
Accommodations and restaurants	...	9	7	9	4

*This classification is based on data from Table 2.4 (*Breakdown of service R&D spending by sector of activity*), Figure 2.3 (*Investments in machines and equipment by sector as a % of GDP*), Table 2.11 (*Percentage of companies having undergone organizational and technological change*), Table 2.13 (*Share of jobs in the service sector held by scientific and technical personnel*), and Table 2.17 (*Export growth in Québec's main service sectors*). Rankings are based on the positions held in each table by the sectors or subsectors (NAICS or SIC classifications) corresponding to the sectors in this table.

**Sectors not taken into account

2. Main findings in the examination of the role of public authorities

Policies developed with the manufacturing sector in mind

Given their traditionally negative perception of the role services play in the economy, public authorities have thus far paid little heed to the service sector in their policies on innovation. There is a general tendency to focus policy objectives and means on the broad needs of the manufacturing sector and innovation of a technological nature. More specifically, examination of the common fields of intervention of policies currently in force in the main industrialized countries reveals the following principal findings:

R&D Support

Support for technological innovation

R&D support programs are designed first and foremost to stimulate technological development within the manufacturing sector. Yet most innovations in services are not of a technological nature, but rather stem from new ideas, methods, or approaches. As such, the “research” component in services is often based on the social and human sciences, a field often overlooked by R&D programs.

Support for Technological Transfer

Measures for all

Long considered mere users of the technologies produced by the manufacturing industry, service industries in all countries enjoy measures designed to promote the adoption of new technologies.

Support for Human Resources in Science and Technology

Measures focused on NSE

Whether to attract more young people to scientific and technical careers, encourage the employment of scientific and technical personnel, or provide greater congruity between supply and demand, the orientations and measures adopted by most governments generally

target disciplines and jobs in natural sciences and engineering. The labor force requirements of service businesses, which often need workers with skills in social and human sciences, are rarely taken into account by political authorities.

Support for Globalization

New measures for the service sector

With the major progress made since the adoption of the General Agreement on Trade in Services, measures that have long been intended for trade in goods (regulatory reform, financial and technical support, market information and monitoring, etc.) have now been extended to trade in services.

Support for High Tech Businesses and New Growth Sectors

Measures for "high tech" sectors

The measures introduced by most governments to support new high tech startups are mainly aimed at the biotechnology and information technology sectors, including "technology" services associated with the Internet and e-commerce. Programs designed to promote scientific research and step up technological development in new growth areas are generally meant for the same sectors.

Support for Innovation Networks

Measures for "high tech" networks

Most governments favor three strategies to encourage cooperation between agents of innovation: promoting industrial R&D networks, supporting the creation of innovation clusters, and strengthening ties between industry and universities. Only initiatives designed to facilitate the creation of innovation clusters cover all sectors of activity, including non-technological services. Other strategies generally target high tech sectors (industrial R&D) or an amalgam of sectors that usually does not include traditional services (university/business cooperation).

2.1 OECD propositions

To strengthen innovation in services

Acknowledging the shortfalls of current policies, OECD has initiated an approach to more fully and effectively integrate services into the objectives and methods of government strategies on innovation. Although it does not furnish a formal framework of principles or recommendations, OECD's work provides a series of general propositions that public authorities could adopt to improve their policies aimed at strengthening innovation in the service sector. These propositions can be summarized as follows:

- Define an overall integrated policy framework to ensure greater consistency and effectiveness in government efforts to promote innovation in services
- Involve service companies in the establishment of government measures and orientations to better reflect their needs
- Redefine R&D programs or attach less importance to them by adopting other measures that better reflect the characteristics of innovation in services
- Review intellectual property laws to ensure better protection for service companies
- Implement a general framework for action to facilitate access to IT and promote better use of it
- Develop human resource skills by encouraging closer cooperation between the academic world and businesses in the sector
- Reduce barriers to trade and investment in order to increase the number of job opportunities in the various fields of the service sector

- Continue regulatory reform to reduce and simplify the many regulatory and administrative procedures that hinder the startup and growth of business in the sector
- Broaden the scope of partnership programs usually meant for the manufacturing sector, particularly those designed to promote innovation clusters and university/business relations
- Maintain support for the development of strategic business services, as they help step up innovation in all organizations
- Improve the statistical coverage of services, notably basic economic statistics and data on innovation

2.2 Quebec policy

An ambiguous policy

The recently adopted *Québec Science and Innovation Policy* is meant to address all fields of knowledge, all organizations, and all forms of innovation. It does not specifically deal with services, but it shows flexibility through the introduction of new notions that broaden the scope of certain types of intervention. But the overall picture remains ambiguous. In certain cases, the Québec policy adopts a traditional approach focused on the needs of the manufacturing industry; in others it takes a more general approach better suited to services. More specifically, the following main observations can be made about the thrust of the policy:

R&D Support

A traditional approach

Québec's approach is similar to that of other governments. However, the policy does not content itself with support for technological development alone, but also stresses the

importance of research in social and human sciences in a number of sectors of activity.

Support for Investment in Technology

Measures for all

Like other policies, Québec's policy includes various measures to foster technology acquisition in all sectors.

Support for Hiring Strategic Personnel

Support for jobs in NSE, and increased openness to SHS

Increasing the number of technicians, engineers, computer specialists, and scientists in industry is the Québec policy's first concern. However, without identifying specific methods, the policy stresses the crucial role that skills in social and human sciences as well as arts and literature can play in the innovation process.

Support for Mechanisms to Adjust the Supply and Demand of the ST Labor Force

Priority for "high tech" sectors

The policy's priority is to encourage solutions that more closely match supply to demand in high tech sectors. However, existing methods are much too broad and encompass virtually all sectors of activity.

Support for New Practices

Measures for the service sector

The policy acknowledges that innovation is more than a question of products and processes, and so seeks to promote the adoption of new practices linked to organizational innovation in all sectors of activity. It stresses the importance of social and human science research that may help support businesses in the development and application of these new practices.

Support for Commercialization Activities

"High tech"

methods for all

Although the policy's traditional emphasis has been on high tech products, it has now stepped up efforts to boost exports by medium and low tech businesses. No specific measures deal with services, but businesses in the sector can use various measures designed for all sectors of activity.

Support for the Québec Liaison and Transfer Agents

New SHS centers

Given that most liaison and transfer centers (CLTs) call on the skills of specialists from natural science and engineering, the policy advocates the creation of new centers that enlist the aid of social and human science research. It also recommends the accreditation of new college transfer and technology centers (CCTTs), and gives priority to regions without them or sectors deemed strategic given the existing supply. But in neither case (CLTs or CCTTs) does the Policy make any special provisions for the needs of service companies.

Support for Networking Across Québec and Abroad

Priority for "high

tech" sectors

Like a number of government policies around the world, Québec's policy stresses the development of high tech centers throughout Québec and international R&D partnerships. The current measures are essentially designed for businesses in high tech sectors and "high tech" services. However, among the methods planned to foster the development of regional innovation systems are some that deal with organizations and associations from all sectors of activity.

Support for social
innovation: an
opportunity to
capitalize on

In addition to the general orientations and methods that directly support business innovation, the Québec policy proposes other solutions that rely on social innovation to stimulate the innovative capacities of all organizations (government, social, and community organizations). For service companies, the support of the Social Innovation Policy is important in two ways. On the one hand, it tells them that the policy is open to possibilities other than technological innovation and, therefore, acknowledges that other types of innovation occur in services. On the other hand, this support signals that measures to strengthen the contribution of social and human sciences will be taken and that, although not specifically intended for the service sector, they may be beneficial to it.

3. Summary and conclusion

A summary of the
main weaknesses

As a summary and general conclusion, table 4.2 presents a synopsis of the main weaknesses and problems identified in the service sector innovation profile, the statistical coverage of the sector, and an analysis of the scope of *Québec Science and Innovation Policy* for each of the major aspects considered.

TABLE 2. — MAIN WEAKNESSES IDENTIFIED IN THE INNOVATION PROFILE OF QUÉBEC SERVICES, THE STATISTICAL COVERAGE OF THE SECTOR, AND THE SCOPE OF THE QUÉBEC SCIENCE AND INNOVATION POLICY			
Aspects	Innovation profile	Statistical coverage	Québec Policy
R&D activities	Significant decrease in Québec and Canadian R&D spending in the transportation & warehousing and finance & insurance sectors	Activities generally underestimated. Data only on R&D in natural science and engineering	Measures focus solely on R&D in natural science and engineering used in the manufacturing industry

Technology Acquisition	Significant decrease in investment in machines and equipment in the accommodation and restaurant sector	No specific problem (data available on all sectors of activity)	No specific problem (measures addressing all sectors of activity)
Organizational Change	Low adoption rate of organizational change by service SMEs (under 100 employees), particularly in the transportation & warehousing and accommodation & restaurant sectors (Canadian data)	No data on Québec.	No specific problem (measures addressing all sectors of activity)
ST Personnel	Sharp decrease in ST personnel in the transportation and warehousing sector	Data generally cover jobs in natural science and engineering related to R&D and technology acquisition	Measures generally focus on jobs in natural science and engineering (scientists, engineers, computer specialists, and technicians)
Commercialization and exportation	Québec lags behind in overall service exports	No specific problem (data available for all sectors of activity)	Measures favor the manufacturing sector, but are available to all sectors of activity
Innovation networks (external sources or factors of innovation)	Weak cooperation between service companies and university research centers and institutes, both government and private (Canadian and European data)	No data on Québec.	Measures focus mainly on liaison and transfer mechanisms in natural science and engineering (CLTs and CCTTs) and on R&D consortia

RECOMMENDATIONS

Three main objectives

In light of the main findings on innovation in Québec services and the main observations stemming from the examination of the role of public authorities, this advisory report, through its recommendations, aims to meet three objectives. First, it seeks to encourage the government to **adapt the orientations and instruments of the *Québec Science and Innovation Policy* to the innovation needs of the service sector** (recommendation 1). Second, it aims to suggest concrete ways to **rapidly correct certain major weaknesses identified in the innovation profile and in the analysis of the *Québec Science and Innovation Policy*** (recommendations 2 and 3). Lastly, it proposes ways to **enhance understanding of the service sector and how it innovates** (recommendation 4). Thus, based on these three objectives, we recommend the following:

Recommendation 1

That the Minister of Economic and Regional Development define an action strategy attuned to the reality of innovation in service companies

As most studies on this issue show, innovation policies have to be reviewed and adapted to take into account the importance of services (about three-fourths of jobs and GDP) and their distinctive features in terms of innovation. As the main engine of growth and job creation in Québec and all industrialized countries, services warrant special government attention. For Québec to improve its economy's overall capacity for innovation and enhance productivity, the service sector must be its first priority.

Methods

1. Define an action strategy within the scope of the *Québec Science and Innovation Policy* to encourage innovation in the Québec service sector
2. Ensure the active participation of service companies—and possibly service users and consumers—in the development of such a strategy to better convey their needs and take into account the characteristics of innovation in their various fields
3. Involve all relevant government departments and organizations in the development and implementation of the action strategy to ensure that government action is consistent and effective
4. Implement the action strategy, giving priority to the following points:
 - a) Define general orientations for all services and specific orientations for each of the main areas of the service sector, notably by distinguishing orientations that target “high tech” services (essentially those services related to IT) and scientific and technical services (consulting and R&D services in natural science and engineering) from orientations related to other branches of the service sector (trade, transportation, the cultural industry, finance and insurance, arts and entertainment, etc.)
 - b) Based on these orientations, adapt existing measures or propose new measures to take into account the characteristics of each of the main branches of the service sector or the two main groups of sectors described above (with “high tech” and scientific and technical services together in one group and other branches in the other)

c) In developing or adapting government measures, pay particular attention to the issues raised within the following fields:

- *Support for business R&D*—current measures do not incorporate the research activities of most services (research in social and human science, but also in any discipline other than natural science or engineering)
- *Support for hiring strategic personnel*—current measures target jobs in natural science and engineering, without considering other skills that play a key role in the innovation process in services (social and human science expertise as well as in the arts and literature)
- *Support for commercialization activities*—current measures clearly favor activities in the primary and manufacturing sectors
- *Support for Québec liaison and transfer mechanisms*—most current centers (CLTs and CCTTs) pool expertise in natural science and engineering and their main clients are businesses in the primary and manufacturing sectors
- *Support for networking throughout Québec and abroad*—current measures are essentially designed for high tech sectors and services
- *Support for social innovation*—the objectives in this area fit with the needs of service companies in many respects, but planned measures only target government, social, and community organizations

Recommendation 2

That the Minister of Economic and Regional Development quickly take measures to strengthen service companies' capacity for innovation

With regard to the broad observations we can draw from our analysis of innovation in Québec services and the measures announced in the *Québec Science and Innovation Policy*, Ministère du Développement économique et régional can immediately adopt or improve certain methods to correct some of the main weaknesses identified. In practical terms, the Department can intervene on a short-term basis in at least four areas: research activities in the traditional service sectors, a field currently without any support mechanisms in Québec; exportation, which stands out as one of the main weaknesses of the service sector; promotion of organizational innovation in service SMEs, which, according to surveys conducted on the issue, are the least likely to engage in the new practices associated with this type of innovation; and support for R&D and the employment of scientific and technical personnel in sectors that are generally less innovative.

Methods

1. Alter or extend the current mission of certain liaison and transfer centers and/or certain college transfer and technology centers—and, if necessary, create new centers or liaison and transfer mechanisms—to meet the research needs of traditional service companies, particularly in sectors that appear less innovative, based on the findings of the innovation profile, such as those in the accommodation and restaurant, transportation and warehousing, and, to a lesser degree, the finance and insurance sectors

2. Expand and reinforce the Québec government strategy on international trade in order to direct its orientations and methods more towards supporting service company exports. In a context of increased competition, identify the degree to which the service sector possesses the same means and conditions as the primary and manufacturing sectors for developing world-class services and penetrating foreign markets with ease
3. Redefine and reinforce initiatives to promote and back the adoption of new practices associated with organizational innovation (advanced management practices, new strategic orientations, changes in organizational structures, etc.) in order to specifically target service SMEs, particularly those in traditional sectors
4. Encourage businesses in the transportation & warehousing and finance & insurance sectors to appreciably increase their R&D investments in order to close the wide gap between them and Canadian businesses, particularly those in Ontario. Also, encourage businesses in the transportation and warehousing sector to rely more heavily on scientific and technical personnel in their operations

Recommendation 3

That the Minister of Economic and Regional Development implement a measure to promote and support pilot projects in the service sector

To address a major shortcoming in the *Québec Science and Innovation Policy* and promote innovation in traditional services, Ministère du Développement économique et régional could initiate a measure to support pilot projects in the service sector.

Methods

1. Establish a support program for pilot projects in the service sector. The goal of this program would be to support the research necessary to explore new approaches, methods, or practices designed to create new services or significantly improve existing services. It would be based on a risk-sharing formula and be designed for all traditional service sectors, but would mainly target sectors generally considered as less innovative (accommodation and restaurant, transportation and warehousing, and other sectors). The program could be designed to target pilot projects on the basis of regional needs in innovation.

Recommendation 4

That Institut de la statistique du Québec and Observatoire-réseau du système d'innovation québécois (ORSIQ) improve their statistical coverage and knowledge of services.

Compared to the amount of data available on the manufacturing industry, basic statistics on services are generally insufficient and poor in quality. Data and analyses on innovation in services are also sorely lacking. To better understand the performance of services and design policies better adapted to their characteristics, it is imperative to have information that is more complete and of higher quality.

Methods

For Institut de la statistique du Québec:

1. Produce basic economic statistics on the service sector comparable to those on the manufacturing sector
2. Improve basic data collection on service activities in science, technology, and innovation, notably by providing more complete data on each of the main branches of the sector

For Institut de la statistique du Québec and Observatoire-réseau du système d'innovation québécois (ORSIQ):

3. Establish a program of periodic surveys on innovation in Québec businesses in all sectors, including the service sector, taking into account work by Statistics Canada. To that end, develop new methods to measure nontechnological innovations and other evidence of innovation in services

For Observatoire-réseau du système d'innovation québécois (ORSIQ):

4. Conduct research or have it conducted on all aspects related to internal and external factors of innovation in services, particularly research that is likely to help improve the various forms of cooperation between service companies and the other stakeholders in the innovation system.