The Case for a Federal Science eLibrary

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Executive Summary

The Critical Role of Information in Research, Development, and Innovation

The Government of Canada has an ambitious innovation agenda to move Canada from 15th to 5th place globally in research and development (R&D) activities by 2010. The Government OnLine (GOL) initiative and other funding efforts are designed to strengthen our innovation ability, make Canada more competitive, enable employee-centric activities within government and transform the way government does business. Reflecting these priorities, total federal expenditures for R&D activities in the natural sciences are now at $3.4B and growing.

There are 21,000 professionals in the federal government - researchers, scientists, policy analysts, and decision-makers – working in science, technology, and medical (STM) disciplines. The ability of this group to perform high-calibre R&D work efficiently is critical to the government’s capacity to achieve its innovation agenda articulated in Canada’s White Paper on Innovation “Achieving Excellence” and “Knowledge Matters”.

Key to all high quality R&D efforts is seamless access to published research information. Seamless, equitable access at the desktop to the world’s electronic research journals (e-journals) is now the standard worldwide for STM personnel in universities and industry. Canadian government STM professionals currently have insufficient access to scientific information.

Consequently, federal knowledge workers are ill-equipped to contribute to the knowledge-based economy and the federal government is in a non-competitive position to attract and recruit new talent to replace retiring professionals.

Challenges in R&D Information Supply

The challenges to providing access to electronic journals are threefold:

**Licensing:** Federal government librarians report that negotiations for e-journal licenses are time-consuming and require special expertise. There are no standard licenses. Negotiations undertaken independently by each library or by a small group of libraries are inefficient. In regard to licensing STM journals, there is no structure within the federal government with the professional knowledge, expertise and mandate to leverage the federal libraries’ combined negotiating influence and buying power with publishers.

**New and Increasing Costs:** Federal library budgets are under extreme pressure. E-journal licenses are an additional cost to libraries. Paper formats will not disappear because older issues are in print format only and many publishers provide access to the electronic on condition that there is also a paper subscription. In addition, publisher subscription rates for all formats are increasing at a rate of 15 to 20 percent annually. The multidisciplinary nature of research requires that libraries provide STM professionals access to a greater number of journals than in the past.

The lack of e-journals at the desktop results in knowledge workers spending more time than is necessary accessing relevant and timely information. A conservative estimate is that STM professionals annually spend $24M of unproductive information search time resulting in an overall cost of $96M over 4 years.
**Infrastructure:** A robust information and technology infrastructure is needed to provide desktop access to STM resources. A solid foundation will provide a framework for archival capabilities that would give Canada long-term access to the world’s published electronic STM information.

**Solution: Federal Science eLibrary**

The Strategic Alliance of Federal Science and Technology Libraries recommends the creation of the Federal Science eLibrary. The Alliance further recommends the formation and funding of the Office of the Federal Science eLibrary, governed by the Alliance and housed at the Canada Institute for Scientific and Technical Information (CISTI). The Office will manage the activities required to make e-journals more efficiently and effectively available for all federal STM professionals in all departments charged with achieving Canada’s goals of leadership and excellence in the global economy.

**Investment**

An annual average investment in the Federal Science eLibrary of $10M, that is, $40M over four years, is 0.3% of the annual federal funding for R&D in the natural sciences. The proposal focuses on the need for a centralized, joint negotiating body and dedicated funding.

Two approvals are sought:
- Funding of $40M over four years to support the Federal Science eLibrary’s operations, pay for licenses and underwrite the technical implementation of licensed content to government STM professionals across Canada.
- Approval in principle for ongoing, sustainable funding.

**Benefits and Savings**

Investing in the Federal Science eLibrary will:
- Provide STM professionals with seamless and equitable access to the world’s electronic research journals.
- Strengthen the negotiating position of federal libraries vis-à-vis publishers for licenses to e-journals.
- Increase the total number of e-journals available to all federal government employees.
- Eliminate the unproductive search time spent by STM professionals, conservatively estimated at $96M over four years.
- Facilitate and improve the recruitment and retention of STM professionals.
- Reduce administrative costs in licensing and negotiation activities.
- Enhance the GOL single window, client-centric approach for access to research information and potential links to other federal government information infrastructures.
- Provide a platform for future government initiatives related to desktop access to electronic science publications.
- Enhance the probability of the Government of Canada achieving its innovation agenda.
1. **Critical Role of Information in Research, Development, and Innovation**

**A Commitment to Innovation Excellence**

The Government of Canada is committed to a strategy of support for innovation. In its White Paper on Innovation "Achieving Excellence" and Knowledge Matters" and in Speeches from the Throne, the Government has emphasized the need for Canada to become and remain internationally competitive. Through recent funding commitments, the Government of Canada has clearly signalled its intention to move Canada from 15th to 5th place globally in research and development (R&D) activities by 2010.1

**The Federal Government’s Work in Science, Technology, and Medicine**

The government invests in defence, emergency preparedness, regulatory activity, environmental and health protection, and strategic research on behalf of all Canadians. In turn, Canadians enjoy the benefits of the government’s work in science, technology, and medicine (STM) through economic advances and high quality of life standards. Federal STM activities contribute to job creation and technical progress, key elements in the productivity growth necessary for a rising standard of living.

In support of its goal, the government expenditure for R&D in natural sciences is currently $3.4B.2 Of this amount, 52%, or $1.8B, is funding where the federal government is the performing sector.

The Government of Canada employs approximately 21,000 professionals3 – researchers, scientists, policy analysts and decision makers – in STM-related fields. Their collective expertise and achievements contribute to Canada’s ongoing success as an advanced and prosperous society.

**The Federal Government’s Need for Information**

To achieve that success, STM professionals depend on a robust foundation of, and constant access to, the world’s scientific and technical information. Information is as indispensable a success factor as are technology, laboratories, instruments and expertise.

Today, federal STM professionals do not have seamless and equitable access to the world’s STM information at the desktop, from anywhere at anytime. This proposal provides a solution to this critical requirement.

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3 According to Treasury Board data for March 2002, there are 21,266 employees in the Government of Canada Scientific and Professional Occupational Category.
2. Challenges in R&D Information Supply

In the last decade, R&D communities worldwide have come to rely heavily on electronic as well as printed journals. STM professionals now expect equitable and seamless access at the desktop to a comprehensive and multi-disciplinary range of journals.

There are three key challenges in providing access to electronic journals (e-journals):

- Licensing
- Costs
- Infrastructure

Licensing and Managing Access Rights to Electronic Journals

Acquiring e-journals requires a new access model and new business practices. Libraries do not buy subscriptions as they do with paper, but rather they negotiate a license to the rights to use the electronic content of journals. Publishers are now offering access to pre-determined packages of electronic journals rather than to specific journal titles. However, since there are no standard license agreements, each negotiation, with hundreds of publishers, is unique. Negotiations undertaken independently by each library or by a small group of libraries are inefficient. The process of establishing and maintaining license agreements requires an inordinate amount of time for each library and new expertise in negotiations.

Publishers have also shown a preference for negotiating with a group of libraries rather than individual libraries. In regard to licensing STM journals, there is no structure within the federal government with the professional knowledge, expertise and mandate to leverage the federal libraries' combined negotiating influence and buying power with publishers. Publishers are not motivated to negotiate with individual libraries since each provides only limited revenues.

New and Increasing Costs

The advent of an electronic format has not meant the demise of journals in paper format. Libraries do not realize any cost savings with electronic formats. On the contrary, licenses for electronic journals represent an additional expense to existing library budgets. Older volumes may be available in paper only, while new volumes may be available in paper, electronic, CD, multi-media or any combination of these formats. Many publishers will provide access to electronic journals only if libraries purchase the print version. In addition, a number of publishers add a surcharge to the subscription cost to cover electronic access. Added to these costs are annual increases in subscription rates and increases in exchange rates that carry an additional cost of 15 to 20 percent per annum.

STM professionals require access to more journals to support their cross-disciplinary research. To ensure adequate subject coverage in support of multi-disciplinary research, libraries must provide access to a greater number of journals than in the past.

Another cost element is that of the STM professional’s time spent on ‘hunting for information’. A lack of comprehensive and equitable access to electronic journals at the
desktop results in knowledge workers spending more time than is necessary accessing relevant and timely information. Based on the Ingenta study\(^4\), 80% of researchers read 2-10 articles per week. Using the findings of this study, a conservative estimate is that federal STM professionals annually spend $24M of unproductive information search time resulting in an overall cost of $96M over four years.

There is also a cost related to licensing access to e-journals so as to create a national information asset. Licensing access to content is similar to renting. The access is in place only for as long as the institution continues to pay the annual fee. This results in an additional ongoing cost to maintain access to past years of essential R&D information.

**Infrastructure**

**Desktop access**

Federal STM professionals need access to a broad spectrum of STM e-journals in order to work collaboratively with their colleagues in other departments and with researchers in academia and the private sector. To provide seamless and equitable access, from anywhere at anytime, requires a sophisticated and robust IT infrastructure. The infrastructure must manage access rights, have the functionality to support user authentication and link set-up and management, provide business information on usage and include centralized IT support.

**Long term access**

Most license agreements only grant access as provided by the publisher for a certain period of time. There is no guarantee that a publisher will be in business in the long term or that libraries will retain access if journals are transferred to another publisher. To preserve the government's investments and to ensure that knowledge is accessible in perpetuity, libraries are investigating ways to archive electronic content. New and additional resources are required for the IT infrastructure if it is to address the challenges of providing perpetual access to STM information for the federal government.

**Competition for talent**

Recent graduates from Canadian universities are accustomed to seamless access to electronic STM journals. This new talent rightly expects the same ‘electronic toolbox’ to be available for all federal science-based departments. The federal government is competing with universities and the private sector for this new talent that is critically needed to replace the large cohorts of retiring STM professionals in government departments.

3. Solution

Canada’s Academic Sector Model

Canadian universities launched the Canadian National Site Licensing Project (CNSLP) in 1999. Jointly, the academic libraries applied for and received funding from the Canada Foundation for Innovation to underwrite the cost of licensing electronic journals. Through their collaboration, the CNSLP libraries negotiated favourable license agreements, achieving price reductions in the range of 10-40% off the standard publisher prices and saving vast amounts of professional time. At the same time, they increased the total number of e-journals available to academic researchers, thus addressing the challenge of the increasingly multi-disciplinary nature of research.

Major initiatives similar to CNSLP have been launched in the United States\(^5\), the United Kingdom\(^6\) and Australia\(^7\). The models developed in these countries are based on formalized collaborations among partners and new, dedicated funding to support broad-based access to electronic journals.

Government of Canada Model

At the same time as the CNSLP was initiated, the libraries of six federal departments\(^8\) formed the Strategic Alliance of Federal Science and Technology Libraries (the Alliance) to collaborate in delivering leading edge services to their clients. The Alliance is seeking the funding necessary to provide equitable access to electronic journals across the federal government and on a level that is comparable to that of Canadian universities. The federal government needs a model, adapted to the Canadian context, and based on the principles of a centralized joint negotiating body. This venture will require dedicated funds to acquire the electronic content.

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\(^5\) OhioLINK (Ohio Library and Information Network) [http://www.ohiolink.edu](http://www.ohiolink.edu)
\(^6\) NESLI (National Electronic Site License Initiative [UK]) [http://www.nesli.ac.uk](http://www.nesli.ac.uk)
\(^7\) CSIRO (Commonwealth Scientific & Industrial Research organization) Library Network [Australia] [http://www.csiro.au](http://www.csiro.au)
\(^8\) The libraries of Agriculture and Agri-Food Canada, Environment Canada, Fisheries and Oceans Canada, Health Canada, Natural Resources Canada, Canada Institute for Scientific and Technical Information (National Research Council).
4. Recommendation: Federal Science eLibrary

In late 2001, the Strategic Alliance of Federal Science and Technology Libraries commissioned a study to develop recommendations for seamless and equitable access to STM electronic journals. In the context of the Government OnLine initiative to transform government business practices, the consulting firm CGI worked with Alliance members to determine the best strategy for addressing the challenges of STM and R&D information supply.

Based on the study’s confirmation of the Alliance members’ concerns, and benefiting from the academic sector’s demonstration of a solution, the Alliance now recommends the formation of the Federal Science eLibrary. The Alliance further recommends the formation and funding of an Office of the Federal Science eLibrary, governed by the Alliance and housed at the Canada Institute for Scientific and Technical Information (CISTI).

The mandate of the Office will be to manage the activities required to make e-journals more efficiently and effectively available for federal STM professionals charged with achieving Canada’s goals of leadership and excellence in the global economy.

Specifically, with its own dedicated staff and budget, the Office of the Federal Science eLibrary will:

- Obtain STM information on behalf of the Government of Canada, negotiating for and acquiring the most comprehensive content and the most favourable pricing and license terms.

- Increase the available body of STM research publications and remove barriers and delays now experienced by STM professionals in government, thus giving them advantages already enjoyed by academic researchers.

- Assist government departments in addressing the technical challenges associated with desktop deployment, for the benefit of all STM professionals.

- Work with stakeholders to address the need for securing archival/perpetual access to STM information, for the Government of Canada.
5. **Investment**

The proposed Federal Science eLibrary requires new funding and an average annual investment of $10M per annum for a total of $40M over 4 years as well as continued sustainable funding. This annual investment is .3% of the annual federal funding commitment to R&D in the natural sciences.

The table below is an estimate of the annual costs for the first four years. These estimates are based on the Canadian National Site Licensing Project model.

<table>
<thead>
<tr>
<th>e- Library Cost Estimates</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>4 Year Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-content</strong></td>
<td>$3,500,000</td>
<td>$8,000,000</td>
<td>$9,500,000</td>
<td>$13,000,000</td>
<td><strong>$34,000,000</strong></td>
</tr>
<tr>
<td><strong>Operating</strong></td>
<td>$1,000,000</td>
<td>$1,500,000</td>
<td>$2,000,000</td>
<td>$1,500,000</td>
<td><strong>$6,000,000</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$4,500,000</strong></td>
<td><strong>$9,500,000</strong></td>
<td><strong>$11,500,000</strong></td>
<td><strong>$14,500,000</strong></td>
<td><strong>$40,000,000</strong></td>
</tr>
</tbody>
</table>

**E-content:** This investment is for the access rights for the federal government to STM e-journals from major commercial publishers and specialized publishers.

**Operating:** This investment includes salaries, operational and infrastructure costs and costs associated with deployment to the desktop.
6. **Benefits and Savings**

The proposed Federal Science eLibrary will deliver critical value to Canada’s innovation agenda. It will be an integral part of the federal government’s efforts to move Canada from 15th to 5th place in global research and development activities and, at the same time, it will transform government business practices.

A significant cost saving is in professional time. The lack of e-journals at the desktop results in knowledge workers spending more time than is necessary accessing relevant and timely information. A conservative estimate is that STM professionals annually spend $24M of unproductive information search time, resulting in an overall cost of $96M over 4 years.

Investing in the Federal Science eLibrary will:

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- Enhance the probability of the Government of Canada achieving its innovation agenda.
7. Contributors

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