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## **CISTI STRATEGIC PLAN 2005–2010**

*Exploiting information for innovation*

CANADA INSTITUTE FOR SCIENTIFIC AND TECHNICAL INFORMATION

February 23, 2005

Canada 



National Research Council Canada  
Canada Institute for Scientific and Technical Information

CISTI Strategic Plan 2005–2010

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## EXECUTIVE SUMMARY

The transformation of the scholarly communication medium from print to digital has created enormous change in the world of scientific, technical, and medical (STM) information. Now well established as the norm, the digital environment offers great potential for advancing research and innovation. New ways to aggregate, analyse, deliver, and use information will lead to exciting new scientific discoveries.

The impacts of the digital medium have been profound. In addition to speeding and facilitating the peer review and publication processes, digital publishing has provided the tools that are turning scholarly publishing upside down. Increasingly scholarly communities are devising their own mechanisms to exchange research results, experimenting with personal publishing on the web and open peer review, for example.

The future will see new ways to communicate science, including data and information integration, multimedia, and reference linking embedded in digital objects. STM publishers, including CISTI's publishing program, the NRC Research Press, are investing in technology and expertise to integrate these new options into their publications. Likewise libraries are challenged to remain current with the latest technology to ensure that their clients are able to exploit these advances. Other challenges for libraries include organizing and managing digital STM information and assuring universal, permanent access to print and digital resources.

The promise of technology has also opened the door to providing wider, less costly access to STM information. In reaction to the high costs of scientific journals published by commercial publishers, the Open Access movement calls for the results of publicly funded research to be available free to users. While an economically feasible model for Open Access has not yet been defined, there are many experimental initiatives in place. How this will be resolved is a fundamental question for today's STM publishers and libraries.

Organizations like CISTI hold the keys to unlocking the power of digital STM information. CISTI has already established itself as a world leader in this area, providing secure desktop document delivery directly to clients and free electronic access to the NRC Research Press journals for Canadians. New CISTI services, including competitive technical intelligence and patent information analysis, exploit the ability to search and organize electronically large amounts of information.

The *CISTI Strategic Plan 2005–2010* presents the path that CISTI must take to ensure that the opportunities of the digital STM information environment are exploited to serve Canadians. With the full implementation of this Plan, the infrastructure and expertise will be in place for Canadians to derive value from STM information to fuel their research, innovation and commercialization activities. The window of opportunity is open now to establish this essential infrastructure that will position Canadians to move forward and take advantage of the opportunities that will arise in the digital STM information environment.

The CISTI vision and mission are

***VISION: A leader in driving the exploitation of scientific information to create value for Canadians***

***MISSION: To advance research and innovation through high-value information and publishing services in science, technology, and medicine***

The *CISTI Strategic Plan 2005–2010* is based on the input of 180 stakeholders, including CISTI staff. At nine consultation sessions held across the country, stakeholders voiced remarkably similar visions of the future for STM information. Their views are reflected in CISTI's *Strategic Goals*:

- Goal 1:** Provide universal, seamless, and permanent access to information for Canadian research and innovation
- Goal 2:** Enable researchers and entrepreneurs to advance and exploit knowledge through accelerated, innovative scientific communication
- Goal 3:** Lead STM information communities across Canada to become a national force for innovation
- Goal 4:** Grow as an enabling organization

CISTI's stakeholders want to see the benefits of Canada's investment in STM information infrastructure and resources maximized through cooperation, coordination, and partnership among the key organizations in the government, academic, health, and industrial sectors. They see CISTI as having the expertise, infrastructure, and national role needed to lead this effort and have challenged CISTI to make it happen.

This integrated, partnership-based approach to STM information will result in a Canadian science "infostructure" and a viable national STM publishing infrastructure. The competitive advantages offered by this investment will lead to better research and a more innovative economy. The *CISTI Strategic Plan 2005–2010* provides the blueprint of the actions that CISTI will undertake to make this vision a reality.

## 1. INTRODUCTION — TRANSFORMING TO FULFILL CISTI'S MANDATE

CISTI is recognized as Canada's leader, and one of the world's foremost players, in publishing and disseminating STM information. CISTI ensures that Canadian researchers and entrepreneurs in the academic, industrial, health, and public sectors have access to the STM information needed to support their research and innovation activities that are essential to a vibrant Canadian economy.

CISTI is one of the few NRC institutes that have a legislated mandate. Originating in 1924 as the library serving the National Research Council, CISTI is mandated in the NRC Act to "establish, operate and maintain a national science library" and to "publish, sell and otherwise distribute scientific and technical information." To fulfill its mandate CISTI maintains and provides access to its STM information resources, and publishes and disseminates the results of Canadian and international research. NRC's publishing mandate was first fulfilled by the launching of the *Canadian Journal of Research* in 1929.

CISTI is accessible to Canadians, both virtually and locally. All sectors in Canada are served through CISTI's online services, consortium agreements with Canadian university libraries, support to the peer review publishing system, and close links with NRC's Industrial Research Assistance Program (IRAP). Located across the country, CISTI's 19 NRC Information Centres play a crucial role in providing information services to NRC researchers and supporting industry through NRC's community-based technology cluster activities.

The world of STM information has undergone rapid change since the advent of modern information technology and the Web. This evolution continues at an ever faster pace. Scientific libraries and publishers must constantly transform themselves to meet new challenges and opportunities. Operating at the forefront of this evolution, CISTI is a leader in developing and implementing innovative approaches to STM information access for Canadians. In the past this included compiling the first collective catalogue of scientific publications in Canadian libraries in 1965 and continues today with electronic document delivery to the user's desktop and free access for Canadians to the electronic publications of the NRC Research Press.

With the *CISTI Strategic Plan 2005–2010*, CISTI embarks on a transformative process that will see it become an increasingly technologically sophisticated library, publisher, and information provider, with a clear focus on providing Canadian researchers and entrepreneurs with the STM information, services, and tools that meet their needs and enhance their ability to derive value for Canada.

## 2. VISION AND MISSION

***VISION: A leader in driving the exploitation of scientific information to create value for Canadians.***

***MISSION: To advance research and innovation through high-value information and publishing services in science, technology, and medicine.***

What our **Vision** means

**“A leader”...**

As Canada’s national science library and largest scientific publisher, CISTI will lead in ensuring that Canadians have universal access to the world’s scientific, technical, and medical (STM) information. As a leader CISTI will unite with others to promote the value of STM information in creating a vibrant economy.

**“in driving the exploitation of scientific information”...**

To derive value from STM information, it must be valid, relevant, and actionable. CISTI’s innovative services enable Canadian researchers and entrepreneurs to exploit STM information to further discovery. Valued for its contribution, CISTI will be a key partner in initiatives in fundamental science, applied research, and commercialization across the country.

**“to create value for Canadians”...**

An innovative economy, fuelled by a vigorous STM information flow, will deliver benefits to Canadians, including economic development and growth, improved quality of life, and societal wellbeing. By ensuring that flow, CISTI will contribute to the competitiveness of research and innovation in Canada.

What our **Mission** means

**“To advance research and innovation”...**

CISTI’s purpose is to serve the research and innovation communities. Science cannot progress without the active exchange of information. CISTI ensures that Canadians are well positioned to participate in and benefit from the free flow of scientific communication.

**“through high-value information”...**

Today researchers are faced with information overload. Canadians look to CISTI to deliver distilled, aggregated, and validated information that is relevant to their research and innovation activities. CISTI is their link to the world’s STM information resources, ensuring that they receive the best and most up-to-date information available.

**“information and publishing services”...**

To serve Canadians, CISTI offers innovative, client-focused information and publishing services that are developed and delivered by CISTI’s expert staff. Available at the client’s desktop, these services are provided through a technologically sophisticated infrastructure.

To service NRC researchers and innovative companies, CISTI’s information specialists are available in NRC Information Centres across the country. Their expertise contributes to the success of research and innovation through high-value information and analysis services.



**“in science, technology, and medicine”...**

CISTI's focus is STM information from around the world. Increasingly today new research areas and transdisciplinary fields are emerging, and the lines between research and commercialization are blurring. To fuel the conversion of new knowledge into products and services, CISTI also serves as a gateway for Canadians to business-relevant STM information.

The **Outcome** of the *CISTI Strategic Plan 2005–2010* will be a robust, efficient information flow to enhance research and innovation.

Key to achieving this outcome is an integrated “infostructure” for Canada that provides universal, seamless, and permanent access to scientific and science-relevant information. From the researcher at NRC, to the entrepreneur in a small business, to citizens looking for health-related information, all will have electronic access at their desktop to a wealth of national and international STM information resources, supported by intelligent search and analysis tools and expert advice.

Canadian researchers will share their findings quickly and easily with colleagues in Canada and around the world through a robust Canadian publishing infrastructure. Using innovative publishing and communication tools, they will participate in and contribute to the advancement of science. A key component of the publishing infrastructure will be a viable peer review system that assures the quality and validity of research results.

Clients and companies participating in NRC's innovation support programs will use CISTI's Competitive Technical Intelligence (CTI) and patent information analysis services in support of their operational decisions allowing them to develop appropriate strategies to ensure business success.

With these three essential components achieved, Canada will be positioned to assume a leadership position in the exploitation of STM information to drive research and innovation to benefit Canadians.

### 3. THE STM INFORMATION ENVIRONMENT: DRIVERS FOR CHANGE

For centuries, the flow of STM information was managed through a publishing system, supported mainly by scientific societies, and an access system, provided primarily through public and university libraries. Based on print technology, this system served the needs of the day and evolved slowly and predictably. CISTI, as Canada's national science library, and the NRC Research Press, previously known as NRC Research Journals,<sup>1</sup> served Canadians well within this paper-based paradigm.

This world was thrown into turmoil with the advent of modern information technology and the Internet in the late 20th century. In today's world, STM information is available instantly at the click of a mouse from a wide variety of sources resulting in users' expectations of service being very high. Scientific publishing is in the midst of a revolution that is generating a multitude of new approaches to making the results of research more widely accessible and actionable.

A coherent understanding of this rapidly evolving world is essential to identify the drivers, impacts, and new directions that will shape CISTI's future. CISTI is a complex, multifaceted organization operating within an equally complex environment. CISTI's diverse client base adds to this complexity. CISTI's primary focus is on service to Canadians in the government, industry, academic, and health sectors. In addition, services are also offered to clients around the world based on a business model that includes full cost recovery and the generation of revenues that CISTI reinvests to support its national mandate.

As a result CISTI is influenced by many factors operating within its environment, including the global market forces in the STM information content and publishing industries, changes in the scholarly communication system, and national directions and initiatives. The following sections illustrate how these factors impact on CISTI and its user communities.

*Forces within the STM information marketplace influence not only the expectations and needs of clients, but also the business environment in which CISTI functions.*

#### 3.1 Global market forces

The way that researchers share, access, and use information is changing and nowhere has the impact been more disruptive than in the information content industry. New technologies are making STM information available to a broader audience at a speed never seen before. Powerful free Internet search engines provide access to a dazzling amount of information. Empowered by the promise of technology, users are driving seismic changes in the way STM information is created, shared, accessed, and used.

*With the widespread use of the Internet to publish and access information, the sources and markets for information have become increasingly international. Users have a wide choice of where, from whom, and how they will obtain STM information.*

#### **Competitive positioning**

In response to these opportunities, new services and players have emerged. STM providers have invested in electronic systems to enhance access to their services and content. The race to build new online publishing and information access services has favoured the STM information providers who have access to investment capital. This has created increased competition among STM information providers, which has led to mergers and industry consolidation.

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<sup>1</sup> Established in 1929, the NRC Research Journals merged with CISTI in 1994 and subsequently was renamed the NRC Research Press.

The entry of commercial publishers into STM publishing dramatically changed the dynamics of this field, which was previously the domain of scientific scholarly societies. A few large commercial publishers have gained dominance in the market.<sup>2</sup> Having acquired or developed many of the most prestigious journals in a number of STM fields, the large commercial publishers are able to compete for the best authors. They have solidified their market position by acquiring smaller publishers and streamlining the channels to market. They have also invested in online submission and publishing tools, as well as electronic access to their content.

As a result of this increased competition, many not-for-profit STM publishers, such as scientific societies, academic presses, and the NRC Research Press, find it more difficult to attract authors, stay up to date with technology, and grow revenues needed to support their activities and introduce new services.

Monopolization of STM publishing by large commercial publishers has resulted in collection costs for STM libraries that increase by a factor of more than 10% per year for the last decade.<sup>3</sup> Faced with increasing costs for STM information resources, and in many cases reduced budgets, academic libraries have developed new approaches to providing service to their clients. Canadian academic libraries have responded with the incorporation of the Canadian Research Knowledge Network (CRKN), which grew out of the Canadian National Site Licensing Project (CNSLP). This initiative, funded by the universities, provides desktop access for Canadian academics to a wide variety of electronic STM journals through nationally negotiated licenses with the publishers.

To further control costs, academic libraries have harnessed the power of technology to increase electronic resource sharing, formed national and regional library consortia, and rationalized their collection acquisitions. They have come to rely on CISTI to hold and provide permanent access to the STM journals that they cannot afford to acquire electronically. They have also turned to alternative suppliers in the field of STM information delivery. These include commercial information organizations, such as Nerac, Inc., and Infotrieve, and CISTI-like organizations, such as Institut de l'information scientifique et technique (INIST, France), Los Alamos Library, Commonwealth Scientific and Industrial Research Organization (CSIRO, Australia), and the British Library. All of these organizations have undertaken to provide access to electronic resources directly to the user's desktop.

### **Impacts on CISTI**

CISTI faces the same challenges as the academic libraries in maintaining and developing its collection. Annual increases in journal prices, static government funding (A-base), and the costs of maintaining print and electronic versions of journals have resulted in a dramatic decline in CISTI's buying power and therefore in the number of active serial titles that CISTI can afford to hold.

Increased competition and the growth of alternative ways of accessing STM information have impacted on revenue from CISTI's business lines. Starting in 2002–03 revenue from document delivery has declined each year due to decreasing order volume; this is expected to continue for the foreseeable future. During the same period revenue from publishing has stabilized, although moderate growth is expected in the future through improved production processes and new product and service offerings. Balanced against the need to enhance and diversify the collection, provide new services, and invest in new technologies, growth in CISTI's current business lines is not expected to offset increasing costs.

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<sup>2</sup> Outsell, *Financial Performance Scoreboard, Third Quarter 2003: Continuing Growth with Growing Disparity*, Volume 7, January 2004. Outsell is a research and advisory firm that focuses on the information content industry.

<sup>3</sup> Worlock, Kate; *The pros and cons of Open Access*, September 2004, <http://www.nature.com/nature/focus/accessdebate/34.html>

*To address these challenges, CISTI must develop partnerships and define a new funding model that addresses the realities of today's STM information marketplace.*

*CISTI is recognized internationally as a strong competitor in document delivery, offering excellent service and quick turnaround times. (Outsell 2003). In order to retain its leadership position, CISTI must offer more comprehensive electronic content and services to its users, including efficient client relations.*

### **3.2 Open Access — transforming scholarly communication**

The Open Access movement started as a reaction by librarians to what was seen as the excessive pricing practices of commercial STM publishers. Their concerns were echoed by researchers and others who felt that the results of publicly funded research should be freely available. Support for this idea has been growing.

Recently the “open-access” movement received several high-profile endorsements:

- The Association of Learned and Professional Society Publishers declared itself “wholly in favour of maximizing access to research literature...” (Summer 2004)
- The UK House of Commons Science and Technology Committee urged that papers produced by publicly funded research should be put in free repositories soon after publication (Summer 2004)
- A U.S. House committee has recommended that the National Institutes of Health (NIH) post its grantees' papers on a free Internet site (Summer 2004)

Historically the costs associated with the publication and dissemination of scientific research have been covered by the subscribers, mainly institutions such as libraries. In the Open Access model, it has yet to be determined who will bear these costs. The most frequently proposed model is based on authors paying for their articles to be published and to be universally accessible. A logical extension of this approach is for authors to self-archive, possibly in an institutional archive. These approaches would shift the costs of publication or any other form of dissemination and (or) preservation to the researcher's institution or to the public agencies supporting the research.

STM publishers are responding to calls for Open Access with new proposed models of their own. One model would provide the publisher with a limited period of monopoly on rights to the material that they publish after which access to the content would be free.

Scientific societies and for-profit publishers alike are concerned that such initiatives will drive traditional peer-reviewed journals out of business. The proposed “author pays all” model has not yet been proven to be a viable business model. Granting agencies are not lined up in sufficient numbers to provide publishing grants. Scientific societies subscriptions would dry up if essentially the same material were available immediately for free on the Web. “Author pays” schemes have led to concerns that not-for-profit organizations, which rely on the revenue generated from their journal subscriptions, would struggle to keep themselves afloat (BBC, August 2004).

Studies show that readers and authors appreciate the professional input that goes into producing readable journals of high scientific and editorial quality. Librarians are sympathetic of the plight of scholarly journals since very few hold that publishing is costless and few are of the opinion that publishers do not add value to what authors create. Scientific publishing is demonstrably a valuable service and one that does not come cheap, particularly in this era of electronic development.

*Although it is still unclear what model(s) will eventually emerge in response to Open Access, one thing is certain — emerging models will have to be grounded firmly in economic reality to have any chance of success.<sup>4</sup>*

### **Impacts on CISTI**

This decade will see continuing experimentation with Open Access models and growing pressure on publishers to make journals partially or fully open access. This will have significant impacts on not-for-profit publishers, including CISTI's publishing program, the NRC Research Press. CISTI already provides free access for Canadians to the electronic versions of the NRC Research Press journals and monographs. This access is supported by funding from the Government of Canada through the Depository Services Program, administered by Public Works and Government Services Canada. However, CISTI relies on revenue from the sale of NRC Research Press publications outside of Canada.

*CISTI must be aware of and respond to trends regarding Open Access and will need to develop a new funding model for its publishing activities that will take these trends into account.*

Open Access may result in reduced collection costs for libraries. However, costs related to maintaining permanent storage and access may rise. As the trend to institutional repositories becomes a standard practice, CISTI is positioned to develop an institutional repository for NRC and may be called upon by the government to provide broader access to R&D outputs of Canadians through a national repository.

*New challenges and opportunities created by the outcomes of the Open Access movement will impact on CISTI's collection costs and policies and on how CISTI provides access to STM information in the new paradigms.*

### **3.3 Key technologies for the future**

The future is being shaped today by emerging technology that is transforming the way information is created, managed, and disseminated. Information networks are integrating resources in a seamless way, providing users with broad access to content, wherever it is held. All aspects of service provision in today's environment depend heavily on information technology. It is critical that STM information providers and publishers invest in the technologies that meet users' needs.

### **Impacts on CISTI**

CISTI must continue to invest in technologies that will allow it to deliver STM information to its clients where, when, and how they want it.

CISTI must update and integrate its information technology infrastructure and applications to provide fast, efficient, flexible, affordable, and responsive systems.

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<sup>4</sup> Rous, Bernard; *Electronic publishing models and the public good*, September 2004, <http://www.nature.com/nature/focus/accessdebate/33.html>

### **3.4 Canada's innovation environment**

#### **3.4.1 Investments in collaborative multi-sector research and development**

Over the past decade, the Canadian government has placed a high priority on investing in the country's research capacity and strengthening the innovation system. One key thrust has been to encourage greater collaboration among the public, private, and academic sectors as a mechanism to derive greater value and facilitate the commercialization of research findings.

To support this thrust, the Federal government has developed multilateral funding mechanisms including joint interdepartmental initiatives, foundations, and special corporations to further collaboration and research in specific areas. Examples include Genome Canada, Sustainable Development Technologies Canada, and the CBRN<sup>5</sup> Research & Technology Initiative.

The government also encourages research and development by the private sector and has put in place mechanisms to foster investment in areas of strategic potential. For example, Technology Partnerships Canada, a Federal government technology investment fund, supports research and development by targeted Canadian industries including environmental technologies, life sciences, information and communications technologies, and advanced manufacturing, as well as technologies related to hydrogen as a fuel source. Other sectors identified as key to economic development are mining and forestry, manufacturing, automotive, and aerospace.

*Working with collaborative research teams that include partners from different sectors creates unique challenges in terms of equal access to STM information resources.*

#### **Impacts on CISTI**

Providing information services to support national strategic initiatives is a key opportunity for CISTI identified in this Strategic Plan. CISTI must identify initiatives where it can best add value to accelerate the creation of knowledge wealth and benefits for Canadians.

*CISTI must align its STM information resources and service offerings to support research and innovation activities in research-intensive private sector industries.*

#### **3.4.2 Federal research and development**

S&T research and development undertaken by the Federal government has an important role in support of policy development, regulations, standards, and issues of public health and safety, the environment, and defence. This role is unique to the government; neither the universities nor the private sector have mandates or responsibilities in these areas.

In recent years, direct government investment (A-base) in federal government science-based departments and agencies has not been a priority. For example, NRC's A-base appropriation has had limited increases since 1994–95. While funds are available for specific initiatives, they are often awarded based on competitive proposals and are of limited duration (for example, funds received by NRC for the Atlantic Initiatives were initially provided for 5 years only). This has limited the potential contributions of federal departments and agencies.

*Increased government investment in public sector core research activities and supporting facilities is key to enhancing the ability of federal government science-based departments and agencies, including NRC and CISTI, to deliver on their mandates and create value for Canadians.*

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<sup>5</sup> CBRN = chemical, biological, radiological and nuclear

## Impacts on CISTI

CISTI has a national mandate to maintain the national STM collection and provide access for Canadians. A-base funding provided to CISTI to fulfill this obligation is currently below the level received in 1995–1996. To meet this challenge CISTI has focused on developing its business lines: document delivery and publishing. Over the years these activities have contributed substantially to financing CISTI's activities (56% of CISTI's expenditures in 2003–2004 were covered by income). Changes in CISTI's business environment as outlined elsewhere in this document indicate that this model is no longer sustainable.

### 3.4.3 NRC directions

As CISTI implements this *Strategic Plan*, NRC is undergoing change. The arrival of a new President is anticipated and other key management positions need to be filled. This is an opportunity for NRC to set new directions. After a number of years of expansion that saw the development of new institutes, areas of research, and Industrial Partnership Facilities, NRC is reviewing and focusing its activities. Financial pressures, the need to obtain renewal of government funding for key initiatives, such as the Atlantic Initiatives, and other R&D priorities require NRC to ensure that its core activities are adequately supported. The impacts resulting from the current review of Federal government priorities and activities will also have to be factored in.

NRC will continue to play a leading role in community-based technology clusters,<sup>6</sup> helping to increase their capacity in key technology fields through jointly developed innovation strategies. NRC's role is based on three key components: its research and development capacities, the Industrial Research Assistance Program (IRAP), and CISTI. In addition to its role in supporting research at NRC, CISTI works closely with IRAP to provide information, technology advice, and support to small and medium-sized enterprises (SMEs).

Commercialization, which calls for an enhanced flow of technology to the private sector for wealth generation, has been identified as an important direction for NRC. To support this direction, NRC can be expected to continue its focus on collaborative R&D. This includes partnerships and enhanced collaboration with industry as well as with the academic sector. On the industry side, NRC will continue its emphasis on developing Industry Partnership Facilities.

## Impacts on CISTI

In recent years the number of NRC staff who use CISTI has almost doubled. In response to expansion at NRC, CISTI has opened new NRC information Centres, provided services to new NRC research institutes and centres, extended services to companies in new Industrial Partnership Facilities, and offered new services to support commercialization. Working closely with IRAP, CISTI has introduced a new program to provide competitive technical information and patent information analysis to support small and medium-sized enterprises in making strategic technology and business decisions. To meet the demand for more and different value-added services and to support research in new areas, CISTI has grown its expertise and information resources. While some funds have been received to support these new activities, most of the monies have come from within CISTI's budget.

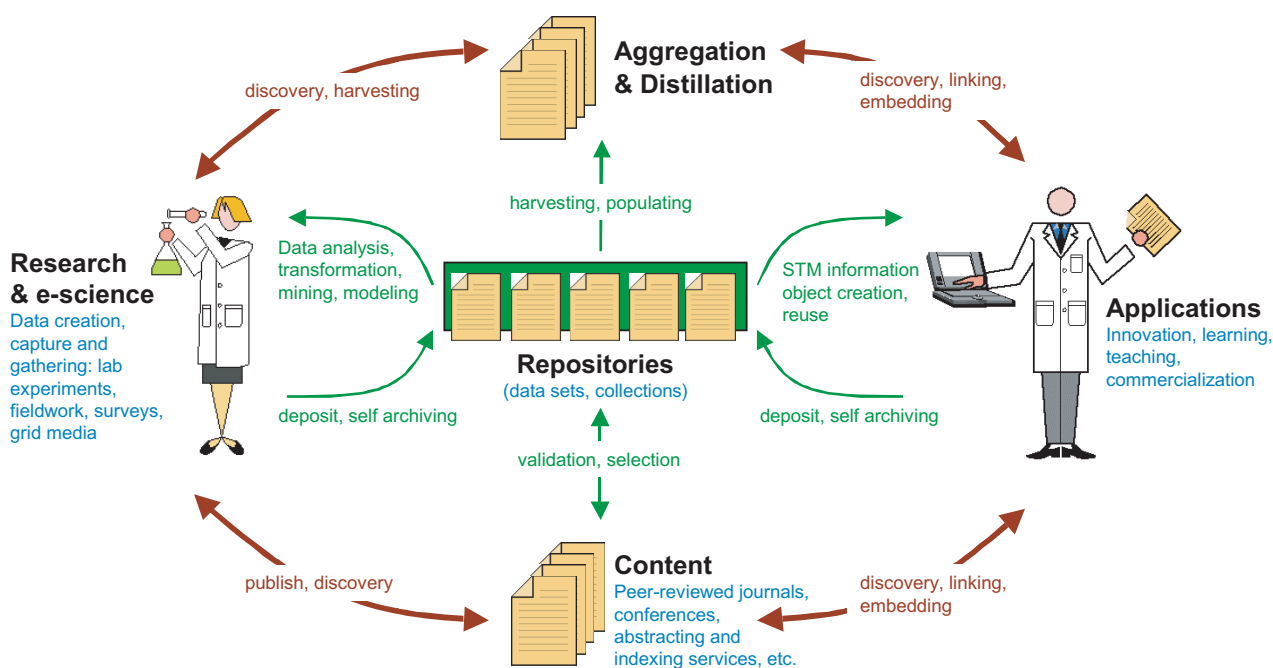
*Renewed funding from NRC and more cost-effective ways to provide services are required to allow CISTI to maintain and enhance its services to support NRC's role in the innovation environment.*

*CISTI is and must remain strongly aligned with the long-term innovation agenda of NRC and the Government of Canada in order to provide maximum value for Canadians.*

<sup>6</sup> The term community-based "technology clusters" refers to the growth of a significant concentration of innovative companies around a nucleus of R&D facilities.

## 4. THE DIGITAL INFORMATION FLOW MODEL

Under the traditional model for information creation, dissemination, and use, the information flow, organized around print publishing mechanisms, was fairly well understood and straightforward. In the digital information environment, the flow of information is faster and more complex, and more opportunities exist for interactions among creators and users to create new knowledge. Based on the OCLC<sup>7</sup> model, CISTI's version of the Digital Information Flow Model presented here provides a graphic interpretation of the highly complex, fully interactive nature of information flow in today's STM information environment.



*This Digital Information Flow Model represents significant opportunities for CISTI to assume a greater role in harnessing information and turning it into actionable information that creates value for Canadians.*

### 4.1 User information needs and expectations

The Information Flow Model represents the arena within which CISTI operates and creates value. To stay relevant, CISTI remains aware of and connected to the information needs and expectations of its clients. As an extension of its ongoing client feedback process, CISTI conducted a series of consultations with stakeholders representing all areas of the STM information environment. Their views on the future for STM information were collected and integrated. The five sessions produced remarkably similar results that related to access and content, search and analysis tools and services, and scholarly publishing.

<sup>7</sup> OCLC, 2003 Environment Scan: Pattern Recognition, USA, 2003. OCLC Online Computer Library Center is a nonprofit, membership, computer library service and research organization dedicated to the public purposes of furthering access to the world's information and reducing information costs. <http://www.oclc.org>



#### **4.1.1 Access and content**

Today's users of STM information are web savvy and have high expectations of easy, barrier-free, seamless access to a wide variety of content, delivered directly to their desktop. They want continuing point-of-need access to validated, relevant information today and in the future: what they need — when, where, and in the format they want.

Users expect access to a wide variety of integrated content to support their research, innovation, and commercialization efforts — content that goes beyond the traditional sources, such as research journals, and includes:

- “Gray literature”, such as conference proceedings, technical reports
- Commercialization-relevant information, including market studies and patents
- Community-based and evidence-based medical information
- Consumer health information
- Business and social science content
- Alternate formats, including print, electronic, video, 3-D, etc.
- Unpublished data that are relevant to published research papers

They want the information to be validated for quality, abstracted, translated, and with embedded linking to other relevant sources of information (for example, reference linking, linking to database, etc.). Users also want a copyright system that is simple, affordable, and enables rather than restricts the dissemination and use of research findings.

*Issues relating to permanent access and digital preservation in the electronic environment need to be addressed. This includes linking institutional collections, creating national and institutional repositories and digital archives, and retro-digitizing print materials.*

#### **4.1.2 Intelligent search and analysis tools and services**

In the digital information environment, new opportunities are available to aggregate and distill information. Users are looking for desktop tools that will allow them to exploit the new capabilities for searching, organizing, analyzing, and integrating scientific information to discover new knowledge. They want the process to be interactive, intuitive, seamless, and reliable. They envision multiple entry points and linkages to all sources, allowing customized, multi- and trans-disciplinary searches. The development of digital repositories facilitates this direction.

They are also looking for technology that is user-friendly and that allows secure, reliable, single-point access, with features such as voice recognition. They also dream of conversion and translation capabilities and a universally accepted medium.

Users don't expect to do it all themselves; they are also looking for affordable access to expert advice and services. They look to experts to analyze and synthesize relevant information and provide them with guidance and advice. In particular, they wish to rely on CISTI to provide them with competitive technical intelligence and patent information services based on both published and unpublished sources of information with analysis as the added value. The resulting business-sensitive information on external scientific or technological threats, opportunities, or developments has the potential to increase the competitive situation of a company or a research laboratory.

#### **4.1.3 Scholarly publication**

Efficient, timely publication of their findings is important to researchers. They want a sustainable, independent publishing system, based on a workable business model. They are concerned about speed to publication and a peer review/validation system that establishes and maintains standards to ensure the quality of the information published.

*Supporting and promoting the peer review system to ensure the validity and quality of research results for publication is a challenge faced by scientific publishers, particularly not-for-profit scientific society publishers.*

Researchers see a future where journals will contain diverse content, including manipulable data sets, 3-D modeling, and other interactive applications. They would like to have publishing tools that allow them to engage in informal communication and information sharing (communities of practice) in real time with their colleagues around the world.

*Scientific publishers need to offer innovative publishing systems and communication tools that respond to the expectations and needs for research communication of the scientific community.*

## 5. IDENTIFYING FUTURE DIRECTIONS

In approaching this *Strategic Plan*, CISTI recognized that change within its environment offers opportunities to transform itself to better meet the STM information needs of its clients. To validate the rationale for its new directions, CISTI convened a panel of experts to solicit their views regarding the “big” opportunities for STM information organizations to shape the STM information environment of the future. Their insights were distilled by CISTI staff and the following opportunities were identified.

**Seamless accessibility** presents an opportunity to develop technology, tools and partnerships to realize the vision of barrier-free access to STM information. Seamless access refers to efficient ways for individuals and groups to find what they want and get it quickly without barriers. Barriers to access include costs, management of access rights (authentication or authorization), language, and technology (data storage and search engines). Within Canada, no organization has taken the view of addressing “seamless and universal access” from a national perspective.

**Preserving access to digital STM information** presents an opportunity to lead in preserving access to digital STM information for all Canadians, ensuring that information of continuing value remains accessible and usable. Many small publishers, academic societies, and Canadian universities do not have the resources to preserve access to their output. By partnering with an outside organization, these stakeholders could raise the profile of their works while reducing the costs of preserving access. There is an opportunity for organizations to aggregate this e-content and to provide long-term access.

The challenges related to providing permanent access are substantial. These include obtaining the rights to archive, determining what will be archived, reducing duplication while ensuring that diversity is maintained, and refreshing the data to retain compatibility with new technological platforms. Funding and coordination are fundamental challenges, as are identifying the stakeholders and addressing their needs and expectations.

**Connecting STM communities** presents an opportunity to help STM communities (associations, groups, networks, discussion nodes) establish effective communication channels and develop a practice of using collaborative tools and good knowledge sharing procedures.

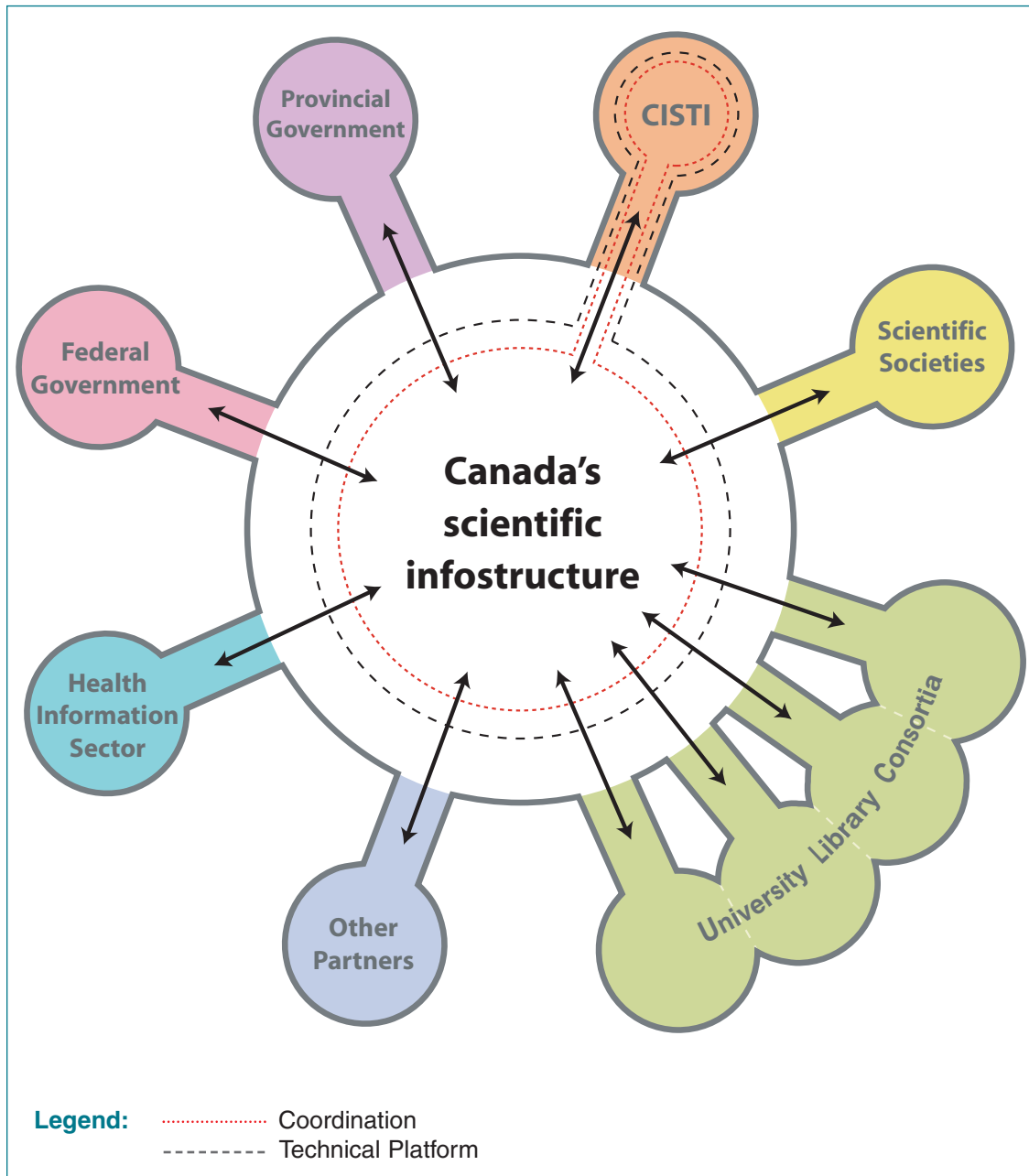
**STM information leadership** presents an opportunity to take on a leadership role to provide coordination and support in developing a national STM information infrastructure that is accessible by all sectors across Canada. Such an infrastructure would exist within a digital environment and would incorporate publishing STM information; holding or providing access to the world’s STM resources; coordinating (through partnerships) access to other national STM information resources; and preserving access to STM information and research data.

*CISTI’s stakeholders envision Canada’s STM information organizations working in a coordinated, cooperative manner to bring together the various elements of a national STM information network. However, one recognized and mandated agency needs to take the lead to coordinate and develop partnerships among the stakeholders; they see CISTI as the natural choice for this role.*

## 6. BUILDING CANADA'S SCIENTIFIC INFOSTRUCTURE

In the strategic planning consultations, CISTI's stakeholders clearly voiced their vision for universal, seamless, and permanent access to STM information for Canadians through a national STM information network — Canada's scientific 'infostructure.' This infostructure<sup>8</sup> will provide all Canadians, regardless of their geographic location, the sector they work in, or the size of their organization, with access to the world's STM information. Intelligent tools and access to expert advice will be provided to help them extract value from the information.

### *Proposed Model for Canada's scientific infostructure*



<sup>8</sup> The term 'infostructure' refers to a system that encompasses information and technology infrastructure.

## 6.1 Working together: building partnerships, networks, and strategic alliances

Success in today's information world increasingly depends on collaboration, partnerships, and strategic alliances. By working together, organizations can realize economies of scale, improve service levels, and maximize the benefits derived from investments in information resources, technology, and expertise.

Within the Canadian context, there are numerous organizations that contribute to ensuring that STM information is managed and delivered to users. Among these organizations there are initiatives in place as described below. Exciting opportunities exist to link these initiatives to create Canada's scientific infostructure and provide universal, seamless, and permanent access for Canadians in all sectors.

### Academic libraries

The Canadian academic library community has a culture and a long history of cooperation and partnership. This is seen in the formation of national and regional consortia in Canada that include the majority of university libraries. CISTI works closely with these consortia. However, the nature of this relationship has changed with the shift from the print environment to the electronic one.

In the print environment CISTI's document delivery services were an important point of access for university libraries to publications that they did not hold. In the electronic environment, the consortia have taken advantage of the opportunities that have opened up to provide enhanced electronic access for their clients directly. They have also found new ways to share resources through shared licensing, acquisitions, services, and infrastructure development.

At the national level, a key achievement of the university library community is the incorporation of the Canadian Research Knowledge Network (CRKN). The CRKN grew out of the Canadian National Site Licensing Project (CNSLP), which was jointly funded by the universities and the Canada Foundation for Innovation (CFI). The CRKN, which is funded by the universities, provides desktop access for Canadian academics to a wide variety of electronic STM journals and key research databases through nationally negotiated licenses with the publishers. This initiative is a true Canadian success story in providing improved access to STM information resources for the academic sector.

At the regional level, the academic library consortia have worked to improve access to electronic information resources for their clients. One example of a regional initiative is the *Ontario Scholar's Portal* implemented by the Ontario Council of University Libraries (OCUL). This web-based portal provides a single point of electronic access for students and researchers at Ontario universities to published journals in a broad range of disciplines, as well as to databases and other electronic services.

The Conférence des recteurs et des principaux des universités du Québec (CREPUQ) has undertaken a study to begin developing the *Bibliothèque de recherche virtuelle du Québec* (BRVQ). The Council of Prairie and Pacific University Libraries (COPPUL) has developed the *Virtual Western Canadian Library* (VWCUL) and the Council of Atlantic University Libraries (CAUL) is interested in developing similar systems for its region.

*Within Canada, no organization has taken a national perspective on how to maximize the value and benefits of these investments in infrastructure and content. CISTI will work in partnership with the academic library consortia to extent universal access to STM information for Canadian academic researchers in all regions, based on the proposed model for Canada's scientific infostructure.*

### **Federal and provincial government libraries**

In seeking to deliver value to Canadians, federal and provincial government libraries share common goals. The *Federal Science eLibrary* is an initiative of the Strategic Alliance of Federal Science and Technology Libraries, an alliance of the libraries of the federal science-based departments and agencies, of which CISTI is a member.

The *Federal Science eLibrary* would provide federal government researchers with seamless and equitable access to electronic journals in the fields of science, technology, and medicine. The eLibrary would do for federal researchers what the CRKN does for academics. The business case and feasibility study have been completed and the initiative is awaiting a decision on funding from the government.

*In cooperation with the Strategic Alliance of Federal Science and Technology Libraries and other government libraries, CISTI will work towards the realization of the Federal Science eLibrary and the development of a flexible partnership model to facilitate improved access to STM information for all federal and provincial government workers as part of Canada's scientific infostructure.*

Under its new mandate, Library and Archives Canada (LAC) is poised to take a greater role in information management for the Federal government. CISTI will work with LAC as a valued partner.

### **Health Sciences Information community**

CISTI works closely with the health sciences information community through the CISTI Committee for Health Sciences Information. This community sees an important role for CISTI, in partnership with Health Canada and the Canadian Health Network, to build in national network of libraries for health. This Canadian-focused network would provide access to a variety of health-related resources, including medical journals, medical alerts, directories, drug information, consumer health, and other aspects of health information.

*CISTI will work with the health sciences information community to seek a solution to providing affordable and universal access to medical and health-related information for Canadians.*

### **Scientific societies**

Canadian scientific societies are important components of the scientific publishing system in Canada. Many are small and struggle to find the resources and expertise to maintain their publications. The shift to electronic publishing is particularly difficult for them. Through the NRC Research Press, access to electronic publishing services and expertise has made it possible for a number of Canadian societies to publish electronic versions of their journals on the web.

*As Canada's leader in STM publishing, CISTI will support research communication by offering leading-edge publication services, systems, and applications to enable researchers to communicate their research results and collaborate with colleagues around the world quickly and easily.*

### **Other Canadian partners**

Canada's scientific infostructure will expand to include other partners who want to make their information resources more widely available to Canadians. Potential partners could come from the industry sector, including sector-specific institutes and associations. NRC research institutes are also potential partners.

### **International STM information organizations**

CISTI currently has resource partnerships that provide access for Canadians to the information resources of other major S&T libraries around the world.<sup>9</sup> These mutually beneficial partnerships are key to ensuring that Canadians have affordable access to the world's STM literature.

*CISTI will expand its current international resource partnerships and develop new ones to ensure continuing Canadian access to the world's STM information resources.*

### **6.2 CISTI's contribution to Canada's scientific infostructure**

*CISTI will make two key contributions to Canada's scientific infostructure: coordination and technical infrastructure.*

The key to success in building Canada's scientific infostructure will be developing close cooperation and coordination among STM information organizations across the country. As Canada's national science library and largest scientific publisher, CISTI is uniquely positioned to lead in making this happen. CISTI will work with other STM information organizations to develop a partnership model that is viable and economically sustainable. When it is warranted, a coordinating office will be established to oversee the shared governance of Canada's scientific infostructure.

To support Canada's scientific infostructure, CISTI will build the necessary common technical infrastructure with its partners. This infrastructure will provide the means to permanently load digital journals and other digital content, build bilingual interfaces for seamless desktop access, and offer discovery tools that facilitate use. Partners will be invited to participate in the development of the infrastructure and to use it to share their collections.

*Canadians have made significant investments in STM information resources and infrastructure across the country. By linking these initiatives and developing the supporting infrastructure, maximum benefit will be derived to support research and innovation in Canada.*

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<sup>9</sup> British Library Document Supply Centre, the Institut de l'information scientifique et technique (INIST) of France, the Korea Institute for Science and Technology Information (KISTI), the Institute of Scientific and Technical Information of China (ISTIC), Sunmedia of Japan, and the Science and Technology Information Center (STIC) in Chinese Taipei.

## 7. CISTI STRATEGIC PLAN 2005–2010: EXPLOITING INFORMATION FOR INNOVATION

Based on the input of its stakeholders, the results of an environment scan that covered the political, business, technology, and policy aspects, as well as an assessment of CISTI's capabilities and culture, CISTI has developed the following strategic framework.



### *Goals, strategic objectives, and key performance measures*

The goals identified in this framework represent the key thrusts for CISTI over the next five years. For each of the CISTI goals, strategic objectives have been identified and are presented below. For a list of CISTI's key outcomes for 2010, see Annex 2.

#### **Goal 1: *Provide universal, seamless, and permanent access to information for Canadian research and innovation***

##### **Strategic objectives:**

- 1.1 Develop a sustainable partnership model for access to STM information across sectors and jurisdictions
- 1.2 Establish a national infrastructure to extend the availability of STM information
- 1.3 Provide permanent access to the world's STM information
- 1.4 Offer tools to facilitate discovery and exploitation of research

CISTI's stakeholders envision universal, seamless, and permanent access to the world's STM information for Canada's researchers and entrepreneurs, where and when they need it. Universal means that all users will have access regardless of location in Canada, the sector they represent, or the size of their organization. Seamless refers to efficient ways to find what they want and get it quickly without barriers. To address the barrier of costs to users, affordable access will be the goal, that is, at a reasonable price or in some cases free. Permanent means that STM information resources will be owned and stored permanently in Canada to ensure ongoing access for Canadians.

To realize this goal, CISTI will work in partnership with other players in the academic, public, health, and industrial sectors to create a coordinated, inter-operative system that will provide cost-effective, user-specific, and easy-to-use access to Canadians. CISTI will ensure permanent access to and storage of digital information resources and will also offer tools that facilitate access to and analysis of the scientific literature. For materials in print format, CISTI will maintain its document delivery services and expand partnerships with national and international resource partners and services.



Key to success will be developing a sustainable partnership model for shared access, securing the rights for permanent access, storage, and delivery of information in digital format, and obtaining secure, ongoing funding. As part of its contribution, CISTI must enhance and diversify its electronic journal collection. CISTI will work with partners, including the Library and Archives Canada, the Canadian academic library consortia, the Strategic Alliance of Federal Science and Technology Libraries, the health sciences information community, and others to build on current initiatives, such as the Federal Science eLibrary proposal, to make this vision a reality.

To extract the full value from STM information requires aggregation, analysis, and synthesis to develop knowledge that is actionable. Through its research mandate, CISTI will develop and offer innovative tools for processes, such as data and text mining, that facilitate the discovery of new knowledge and the exploitation of research.

#### **Key performance measures**

- Canada's scientific infostructure is launched by 2007
- The Federal Science eLibrary is operational by 2008

### ***Goal 2: Enable researchers and entrepreneurs to advance and exploit knowledge through accelerated, innovative scientific communication***

#### **Strategic objectives:**

- 2.1 Develop and offer innovative publishing processes with supporting systems and tools to accelerate scientific communication
- 2.2 Position publishing activities to ensure maximum international profile and impact
- 2.3 Link research to innovation through community-based information services
- 2.4 Create and deliver services to support commercialization

To support researchers, in Canada and around the world, CISTI will implement robust, innovative publishing systems and develop product offerings and marketing strategies to ensure the widest possible dissemination of their research results. CISTI will ensure that researchers are offered the systems and tools to communicate rapidly and directly with their community wherever they are located and in the format or media that is appropriate. It will strengthen the peer-review system and support the volunteer researchers who sustain it to ensure the publication of high-quality, validated results. CISTI will also address the issues of equitable access for transitional and developing countries to the S&T information that it publishes.

To support NRC's role in community technology clusters and commercialization thrust, CISTI will work in collaboration with IRAP and other partners to expand CISTI's program of business-relevant services, such as competitive technical intelligence and patent information analysis. Addressing the needs of small and medium-sized enterprises for actionable information will receive increasing attention by CISTI over the next 5 years.

#### **Key performance measures**

- A viable scientific publishing infrastructure is in place to support scholarly communication in Canada by 2010
- CISTI services to support commercialization are available in each region of Canada by 2007

### ***Goal 3: Lead STM information communities across Canada to become a national force for innovation***

#### **Strategic objectives:**

- 3.1 Create and mobilize a national alliance to raise awareness of the value of STM information
- 3.2 Advance the ability of researchers, societies, and publishers to participate effectively in the evolving scholarly communication environment
- 3.3 Develop an environment that fosters collaboration within communities of practice

CISTI's stakeholders have identified the need for national coordination to mobilize the STM information community to ensure maximum benefit is delivered to Canadians from their investment in STM information resources. They have called on CISTI to assume leadership to make this happen. As Canada's national science library and largest S&T publisher, CISTI is well positioned to fulfill this role.

CISTI will engage other Canadian STM information organizations to form an alliance to raise awareness among decision makers of the value of STM information to research, innovation, and commercialization. The alliance will include key members of the STM information community: libraries and publishers from the academic, health, and industry sectors, and federal and provincial governments. A key anticipated outcome of increased awareness will be sustainable funding for STM information in Canada.

CISTI will call upon its publishing program, the NRC Research Press, to provide leadership in the area of scientific publishing. As new publishing models and technologies develop, the Press has a role in ensuring that the interests of Canadians are put forward and protected and that not-for-profit society publishers have access to programs that support their role in STM publishing. This will be achieved through partnerships and alliances, both national and international, as well as through the publishing of high-quality, validated research results and the offering of innovative publishing services and systems.

Science is becoming increasingly international and transdisciplinary. To encourage a culture of collaboration and enable Canadian researchers to participate effectively in national and international scientific dialogue, CISTI will offer innovative collaborative tools that meet the needs of these communities.

#### **Key performance measures**

- A national alliance that includes key members of the STM information community in Canada is active by 2010

### ***Goal 4: Grow as an enabling organization***

#### **Strategic objectives:**

- 4.1 Strengthen and augment core competencies to support client-focused initiatives
- 4.2 Engage proactively in strategic collaborations and alliances to enhance CISTI's contribution to Canadian research and development
- 4.3 Implement a financial strategy that will ensure sustainability
- 4.4 Conduct research in information science to advance knowledge and promote the adoption of new practices

CISTI's stakeholders have high expectations of CISTI and see it as a natural leader of Canada's STM information community. To meet the expectations of its clients and stakeholders, CISTI needs to ensure that it remains a strong, vibrant, forward-looking organization that continues to grow its human, technological, and information resources.

## Competencies

CISTI's success is created by its competent, committed staff. The capability assessment of CISTI showed that CISTI has the internal strength to assume new directions. It found employees to be engaged in their work and highly committed to the organization. They feel that their work offers opportunities to learn and to grow. To meet the challenges presented by technological advances, new processes, and continuous accelerated change, CISTI will identify the competencies needed and will ensure that its employees have the skills and tools required to carry this *Strategic Plan* forward.

A key new competency that has been identified is the ability to lead, manage, and grow partnerships. As CISTI increasingly looks to partnerships and alliances as a means of ensuring integrated access to national and international information resources, these skills will be more in demand and will be a focus for training and development.

CISTI's stakeholders recognized that the role of information specialists is changing and that they will increasingly be called upon as knowledge brokers. CISTI will continue to develop and acquire competencies to analyse information and deliver business-relevant services.

## Strategic collaborations

A new thrust for CISTI will be to engage proactively with major Canadian research and development initiatives. CISTI will target appropriate initiatives, initiate pilot projects, and develop the people who can deliver the STM information services that are required to make a valued contribution to the success of these initiatives. As an important partner in these initiatives, CISTI's contribution will be recognized and funded.

## A renewed financial strategy

CISTI's strategy is focused on service to the Canadian science and innovation community. In order for CISTI to partner with and serve Canadian organizations, researchers and entrepreneurs, the strategy will require sustained investment.

The key principles governing the financial strategy are:

- CISTI's strategic, operating and financial planning must demonstrate sustainability.
- CISTI will be driven by the needs of clients and partners.
- CISTI will make financial decisions that are informed and conservative, and will manage risk caused by incomplete information, rapid changes in technology and changing markets.

The current financial situation poses challenges to CISTI, as our reliance on revenue growth is being eroded by changes in the marketplace, with a reduced demand for our traditional services. Revenues from document delivery services are declining and we forecast further erosion due to increased desktop access to electronic journals. The NRC Research Press is also experiencing an ongoing reduction in demand for its print journals. Although new revenues are generated from the electronic journals, growth occurs at a slower pace. In recent years, revenues from CISTI's business lines have covered 55–62% of total expenditures.

At the same time, costs continue to increase as a result of growth at NRC, continuing inflation in serial prices, the need to meet client requirements with new products and services, and the ongoing need to invest in information and publishing technology. CISTI has managed this situation by undertaking cost cutting measures, increasing productivity, developing new products and services, and expanding its markets in the United States and other countries.

While revenue will continue to play a significant role, CISTI can no longer rely on revenue growth to finance its activities. New and innovative ways must be found to move forward. This *Strategic Plan* identifies opportunities for alignment with national priorities and initiatives and stresses the importance of partnerships and collaboration to maximize the benefits of Canada's investment in STM infrastructure and resources. To support its strategic directions, CISTI will expand current

partnerships and develop new ones, within and outside NRC, and nationally and internationally. These partnerships will allow for the sharing of resources, costs, infrastructure and risks, as well as benefits. As value is demonstrated, it is anticipated that new sources of funding will become available.

CISTI's new financial strategy will be a mix of revenue, shared investments through partnerships, leveraging of resource and infrastructure investments, and government allocation. To fund its mandated activities and service to NRC, CISTI will seek new resources from NRC and the Government of Canada, including resources to rebuild and cover annual inflation-related cost increases for CISTI's national STM collection and funds for other activities necessary to support innovation in Canada.

#### **Research program in information science**

CISTI will develop a program that advances research in library science, information science, scientific publishing, and information technology of potential benefit to CISTI and the library community. This will include the development and prototyping of potential new tools for information analysis, management, and dissemination. To further this research effort CISTI will work in collaboration with researchers in universities and other organizations.

#### **Key performance measures**

- A vibrant, highly skilled, and satisfied workforce
- Funding for sustained innovation is assured

## 8. FINANCIAL PLAN — RESOURCE REQUIREMENTS AND FUNDING SOURCES

To achieve the goals visualized by the *CISTI Strategic Plan 2005–2010*, CISTI has developed the following Financial Plan that is based on the optimal use of its current resources, which will involve realignment of core activities, and a realistic expectation of new sources of income. CISTI will actively pursue opportunities to secure additional income to advance its planned outcomes.

	Year 1	Year 2	Year 3	Year 4	Year 5
	2005–06	2006–07	2007–08	2008–09	2009–10
<b>Income</b>					
Sales Revenues (incl. DSP) <sup>10</sup>	25,105	25,105	25,105	25,105	25,105
A-Base (NRC)	19,145	19,145	19,145	19,145	19,145
Atlantic Initiative	1,350	1,350	1,350	1,350	1,350
Internal recoveries <sup>11</sup>	800	800	800	800	800
Major Capital (NRC) <sup>12</sup>	1,250	614	–	–	–
Partnerships <sup>12</sup>	400	800	1,000	1,100	1,200
Federal Science e-Library <sup>12</sup>	–	–	500	500	500
<b>Total Income</b>	<b>48,050</b>	<b>47,814</b>	<b>47,900</b>	<b>48,000</b>	<b>48,100</b>
<b>Expense</b>					
<i>Total Realigned Core Activities</i>	41,090	41,529	41,440	41,310	41,215
<b>New Activities</b>					
<i>Strategic Goal 1: Provide universal, seamless, and permanent access to information for Canadian research and innovation</i>					
Canada's scientific infostructure	3,540	2,800	3,020	3,250	3,400
<i>Strategic Goal 2: Enable STM researchers and entrepreneurs to advance and exploit knowledge through accelerated, innovative scientific communication</i>					
Atlantic Initiative (CISTI)	1,350	1,350	1,350	1,350	1,350
S&T research publishing	310	280	280	280	280
CTI services	800	800	800	800	800
<i>Strategic Goal 3: Lead STM information communities across Canada to become a national force for innovation</i>					
National Alliance for STM Information	110	110	110	110	110
<i>Strategic Goal 4: Grow as an enabling organization</i>					
Organizational capacity	850	945	900	900	945
<i>Total New Activities</i>	<b>6,960</b>	<b>6,285</b>	<b>6,460</b>	<b>6,690</b>	<b>6,885</b>
<b>Total Expense</b>	<b>48,050</b>	<b>47,814</b>	<b>47,900</b>	<b>48,000</b>	<b>48,100</b>

**Note:** All values are in constant 2004–2005 dollars (\$K)

<sup>10</sup> DSP, Depository Services Program, Public Works and Government Services Canada.

<sup>11</sup> Internal recoveries from IRAP and other NRC institutes, branches and programs for competitive technical intelligence (CTI) and related information analysis services.

<sup>12</sup> Funding for Canada's scientific infostructure

## 9. VALUE FOR CANADA

The *CISTI Strategic Plan 2005–2010* represents a unique opportunity for Canada to reap the benefits of a robust STM information flow. Through investment in this *Plan*, Canadian researchers and entrepreneurs will have at their fingertips the right information, tools, and access to information experts needed to further their research and commercialization activities. This integrated, partnership-based approach to STM information will result in a Canadian scientific infostructure and a viable national STM publishing infrastructure. The competitive advantages offered by this investment will lead to better research and a more innovative economy.

### **To advance these goals, CISTI will**

- Provide universal, seamless access to the world's STM information
- Enable research and innovation outputs to support wealth generation
- Enhance the ability of Canadians to participate fully in national and international scientific dialogue

### **To ensure success, CISTI must**

- Engage partners for new initiatives
- Build and implement Canada's scientific infostructure
- Implement a viable STM publishing infrastructure
- Deliver solutions that support commercialization
- Build our expertise to offer innovative services
- Maintain and enhance revenue streams
- Attract new funding to support CISTI's national mandate

## 10. CISTI PERFORMANCE MEASUREMENT FRAMEWORK TO 2010

A well-designed performance framework is essential to managing performance and demonstrating value. The current *CISTI Performance Framework to 2005*, which is aligned with the *NRC Performance Management Framework*, will be adjusted to reflect the changes resulting from this *Plan*. The following key performance measures, as well as new measures to track success, will be incorporated:

- Maintain revenues
- Diversify sources of funding
- Implement five to eight national and international STM information partnerships
- Contribute to the success of technology clusters
- Establish four competitive technical intelligence partnerships across Canada
- Provide publishing services to 15 Canadian societies

## ANNEX 1. CISTI GOALS AND STRATEGIC OBJECTIVES

### **Goal 1: *Provide universal, seamless, and permanent access to information for Canadian research and development***

- 1.1 Develop a sustainable partnership model for access to STM information across sectors and jurisdictions
- 1.2 Establish a national infrastructure to extend the availability of STM information
- 1.3 Provide permanent access to the world's STM information
- 1.4 Offer tools to facilitate discovery and exploitation of research

### **Goal 2: *Enable researchers and entrepreneurs to advance and exploit knowledge through accelerated, innovative scientific communication***

- 2.1 Develop and offer innovative publishing processes with supporting systems and tools to accelerate scientific communication
- 2.2 Position publishing activities to ensure maximum international profile and impact
- 2.3 Link research to innovation through community-based information services
- 2.4 Create and deliver services to support commercialization

### **Goal 3: *Lead STM information communities across Canada to become a national force for innovation***

- 3.1 Create and mobilize a national alliance to raise awareness of the value of STM information
- 3.2 Advance the ability of researchers, societies, and publishers to participate effectively in the evolving scholarly communication environment
- 3.3 Develop an environment that fosters collaboration within communities of practice

### **Goal 4: *Grow as an enabling organization***

- 4.1 Strengthen and augment core competencies to support client-focused initiatives
- 4.2 Engage proactively in strategic collaborations and alliances to enhance CISTI's contribution to Canadian research and development
- 4.3 Implement a financial strategy that will ensure sustainability
- 4.4 Conduct research in information science to advance knowledge and promote the adoption of new practices

## ANNEX 2. STRATEGIC OBJECTIVES AND KEY OUTCOMES

### Goal 1: Provide universal, seamless, and permanent access to information for Canadian research and innovation

Strategic objective	Key outcomes by 2010
1.1 Develop a sustainable partnership model for access to STM information across sectors and jurisdictions	Canada's science infostructure provides Canadians with universal, seamless access to the world's scientific literature to support their research and innovation activities  CISTI's digital archiving program ensures permanent access for Canadians to valued STM information
1.2 Establish a national infrastructure to extend the availability of STM information	CISTI's information assets (infrastructure, content, tools, and services) are widely recognized and used to support Canadian R&D activities
1.3 Provide permanent access to the world's STM information	
1.4 Offer tools to facilitate discovery and exploitation of research	

### Goal 2: Enable STM researchers and entrepreneurs to advance and exploit knowledge through accelerated, innovative scientific communication

Strategic objective	Key outcomes by 2010
2.1 Develop and offer innovative publishing processes with supporting systems and tools to accelerate scholarly communication	Our researchers communicate their efforts in real time with the world's scientific communities in whatever format or medium is appropriate  CISTI is recognized as a leader in STM publishing noted for innovative technologies, services, and business approaches to the delivery of STM research information
2.2 Position publishing activities to ensure maximum international profile and impact	CISTI services contribute to successful commercialization activities across Canada
2.3 Link research to innovation through community-based information services	
2.4 Create and deliver services to support commercialization	



### Goal 3: Lead STM information communities across Canada to become a national force for innovation

#### Strategic objective

#### Key outcomes by 2010

- |                                                                                                                                                 |                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1 Create and mobilize a national alliance to raise awareness of the value of STM information                                                  | A national alliance that includes key members of the STM community in Canada is active in promoting the value of STM information in the knowledge-based economy                                                                                 |
| 3.2 Advance the ability of researchers, societies and publishers to participate effectively in the evolving scholarly communication environment | Decision-makers recognize the value of STM information to research, development, and commercialization<br><br>The international impact of Canadian research and science is increased through the use of new scientific communication techniques |
| 3.3 Develop an environment that fosters collaboration within communities of practice                                                            | NRC research and expertise is promoted through involvement in communities of practice and new knowledge is gained                                                                                                                               |

### Goal 4: Grow as an enabling organization

#### Strategic objective

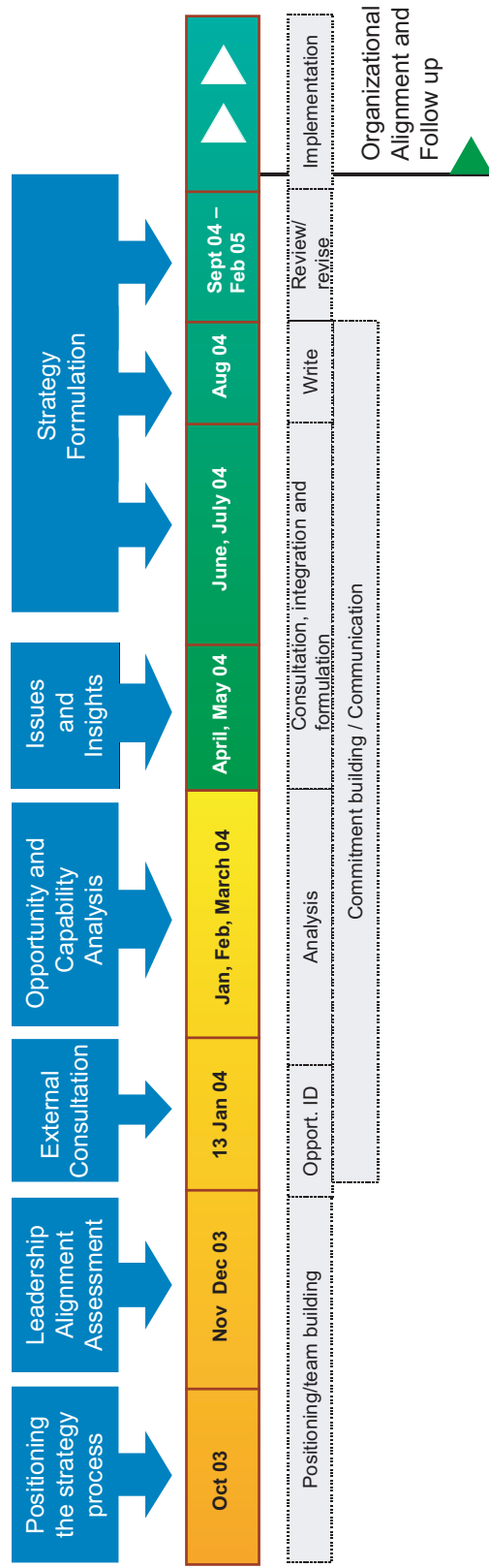
#### Key outcomes by 2010

- |                                                                                                                                       |                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1 Strengthen and augment core competencies to support client-focused initiatives                                                    | CISTI has a motivated, capable, adaptable, and competent workforce to deliver programs and services<br><br>Staff have developed skills and competencies to lead, manage, and grow strategic partnerships |
| 4.2 Engage proactively in strategic collaborations and alliances to enhance CISTI's contribution to Canadian research and development | CISTI is recognized as an organization that attracts and retains outstanding employees<br><br>CISTI is recognized and solicited as a partner in major research initiatives                               |
| 4.3 Implement a financial strategy that will ensure sustainability                                                                    | New funding strategy creates a sustainable environment, through partnerships and alternate sources of funding and revenue                                                                                |
| 4.4 Conduct research in information science to advance knowledge and promote the adoption of new practices                            | Research outcomes have been integrated into the information community<br><br>Researchers of international stature engage in collaborative research with CISTI                                            |

## ANNEX 3. CISTI PERFORMANCE DATA 1999–2000 TO 2003–2004

	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004
<b>1. RESOURCES INPUT INFORMATION</b>					
1.1 A Base Allocation	\$17,594,000	\$21,192,000	\$19,812,000	\$20,842,000	\$22,701,767
1.2 Total Income	\$21,577,000	\$24,125,000	\$27,604,000	\$27,237,000	\$25,272,976
1.3 Total Revenues	\$21,567,000	\$22,421,000	\$25,910,000	\$25,493,000	\$23,557,071
1.4 Total Expenditure	\$40,413,000	\$41,943,000	\$42,435,000	\$47,076,000	\$43,469,000
1.6 Regional Expenditures			\$ 81,282	\$ 65,495	\$ 87,040
1.12 Total Level of Activity	\$40,423,000	\$43,628,000	\$44,119,000	\$48,820,000	\$45,154,000
Cost Recovery Rate (total income as % of total level of activity)	53.30%	55.3%	62.6%	55.8%	56.0%
1.16 Total Staff, FTEs	309	313	316	341	342
1.17 Total RPY	117	116	64	17	67
1.18 Staff Continuing, FTEs (starting in 2002–2003)	56%	61%	77%	262	266
1.19 Staff Term, FTEs (starting in 2002–2003)	44%	39%	22%	71	69
<b>2. OUTSTANDING PEOPLE — OUTSTANDING EMPLOYER</b>					
2.5 Total Non-Grad/Coop Students, FTEs (persons)			34	8	6.2(21)
2.13 Total Research Officers (ROs), FTEs			14	17	18.7
2.15 Number of External Awards			2	5	0
2.16 Number of Internal Awards			2	1	13
<b>3. EXCELLENCE AND LEADERSHIP</b>					
Number of NRC Information Centres	10	17	17	19	19
3.9 Total Number of Invited Presentations		19	38	30	25
3.10 Total Participation in National Committees			14	9	15
3.11 Total Number of External Conferences and Workshops Organized or Sponsored			14	6	9
<b>4. TECHNOLOGY CLUSTERS</b>					
See Performance Report					
<b>5. VALUE FOR CANADA</b>					
Total Number of Journal Titles Held	49,941	49,322	49,342	48,835	48,787
Total Number of Active Journal Titles Held	12,759	12,074	11,500	11,815	8,607
Total Number of Electronic Journal Licenses	3,253	3,582	3,800	3,979	4,358
Total Number of Monograph Titles Held	591,361	600,207	676,182	691,974	711,031
Total Number of Electronic Technical Reports and Conference Proceedings		6,862	11,227	11,664	14,497
Total number of Database Licenses		46	52	53	41
Total Number of Electronic Resources Available		10,490	15,119	15,643	19,855
Total number of Canadian resource partners	1	1	1	2	2
Number of orders placed through Canadian resource partners	12,436	23,683	20,448	19,839	20,593
Total Number of Clients	32,136	32,925	30,527	30,630	23,639
Total Number of Documents Delivered	877,711	1,018,249	993,049	971,509	797,827
% of Documents Delivered to Academia, Canada	47%	50%	50%	50%	43%
% of Documents Delivered to Industry, Canada	23%	22%	20%	20%	23%
% of Documents Delivered to Government, Canada	9%	9%	11%	11%	11%
% of Documents Delivered to Medical, Canada	6%	7%	7%	7%	6%
% of Documents Delivered to NRC Researchers	15%	11%	11%	12%	16%
Number of Journals Published (NRC Research Press)	14	14	15	15	15
Number of Monographs and Conference Proceedings Published (NRC Research Press)	10	12	10	10	14
<b>6. GLOBAL REACH</b>					
6.1 Number of International Conferences and Workshops Organized or Sponsored			1	1	3
6.2 Total Participation in International Committees			13	8	9
6.3 Number of Foreign Delegations Received			7	6	5
Number of orders placed through International Resource Partners	12,107	16,932	17,697	24,382	19,297

#### ANNEX 4. STRATEGIC PLANNING PROCESS



Between January and June 2004, we consulted 180 people from five major Canadian cities, from Montréal to Victoria for a total of nine consultations. CISTI staff members were major contributors to the *Plan*.

**Federal Science eLibrary  
Building the STM Knowledge Infrastructure  
A feasibility study**

Prepared for the  
Feasibility Study Steering Committee  
Strategic Alliance of Federal Science & Technology Libraries

by

W. Stark and A. E. Bourgeois  
Progestic International Inc.

**September 2003**

## EXECUTIVE SUMMARY

The Building Excellence in Science and Technology (BEST)<sup>1</sup> report confirmed that federal government Science and Technology (S&T) research must “maintain a strong capacity to support the health, safety and economic well-being of Canadians through its ability to address science-based issues and decision making for the future.” In performing both research and development and related scientific activities, federal researchers<sup>2</sup> rely heavily on access to current, quality, science, technology and medical (STM) information in the form of journal literature provided by the research services of federal STM libraries. The absence of a federal government strategy to acquire and deliver STM information means that the federal research community is disadvantaged, and unable to benefit from one of the essential levers of cooperation and innovation.

During the past ten years, the purchasing power of federal science libraries has diminished in the face of journal price increases, foreign exchange rates and the continued growth in STM publishing. Base funding for federal government library budgets, which represent approximately .03% of all federal expenditures on research, has remained constant despite a 350% increase in journal prices.

Improved electronic delivery of STM literature has increased the demand for information in digital form. In 2003, the sale of STM digital content surpassed sales of print journals for the first time. Electronic formats provide significant benefits in terms of accessibility, timeliness and usability. Even as more digital STM literature is made available, the Canadian federal information service providers lack the necessary funds to convert to an electronic delivery model.

The Strategic Alliance of Federal Science and Technology Libraries (the Strategic Alliance) was formed to seek cooperative solutions to these significant challenges. In its first report, *The Case for a Federal Science eLibrary*<sup>3</sup> the Strategic Alliance proposed to ensure continuing access to STM information resources for all federal scientific and policy researchers through a web-based gateway to the resources in all federal libraries; and nation-wide, seamless access to published electronic content (e-content<sup>4</sup>).

This study assesses the feasibility of delivering electronic content government-wide and recommends an implementation strategy. It concludes that the establishment of a Federal

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<sup>1</sup> Building Excellence in Science and Technology: The Federal Roles in Performing Science and Technology, A Report of the Council of Science and Technology Advisors, 1999.

<sup>2</sup> For the purpose of this study, researcher is defined as all federal government employees engaged in research at National Research Council Canada, Natural Resources Canada, Health Canada, Agriculture and Agri-Food Canada, Department of Fisheries and Oceans, and Environment Canada, in the following fields of study: Physical Sciences, Natural Sciences, Life Sciences, Medicine/Health, Engineering, Environmental and Earth Sciences, Information & Communications Technology, Regulatory Research, Policy Research, and Interdisciplinary Studies.

<sup>3</sup> The Case for a Federal Science eLibrary, prepared by the Strategic Alliance of Federal Science and Technology Libraries, June 2002.

<sup>4</sup> e-content is a broad term incorporating abstracting and indexing databases, full-text journals, tables of contents, library catalogues and information resources stored in native-web formats.

Science eLibrary to deliver an e-journal<sup>5</sup> program will contribute directly to the achievement of the government's goals for S&T research, and will promote collaboration, communication and linkages for federal researchers. Specifically the study concludes that:

- *A continuing lack of access to STM information will have a negative impact on federal research productivity and recruitment efforts, and will hinder the quality and contribution of federal S&T to the achievement of Canada's innovation agenda.*
- *Investment in digital access to electronic journals will yield excellent value and result in better use and management of public funds.*
- *Federal information service providers must develop new strategies to meet the challenges presented by increased costs and growth in content that characterizes the STM publishing environment.*
- *The federal STM library community should adopt new practices and a business model based on the Canadian National Site Licensing Project.*

If the problems of access to STM information are not addressed:

- Federal S&T objectives for excellence in research will be compromised.
- Federal departments and agencies will experience a continuing decline in researcher productivity and the government's ability to recruit researchers from other sectors will be hindered.
- The ability of the federal research community to address issues that require multi-disciplinary input will be compromised and the opportunity to promote linkages through online scientific communication, both within and outside of the federal research community, will be lost.
- Federal libraries will not successfully transition to electronic delivery of digital formats, leading to loss of credibility and decline in service resulting in loss of existing investment and expertise.

The proposed Federal Science eLibrary would build on the framework described in *Building the Canadian S&T Information Infrastructure*<sup>6</sup>, and would be established as an inter-departmental consortium, with a centrally funded and managed electronic delivery model. The program would require an investment of \$41.8M over five years. Eighty-six per cent of the funds would be used to acquire content.

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<sup>5</sup> e-journals are peer-reviewed journals available online, whether or not they are also available in conventional, printed form

<sup>6</sup> Soublière, Jean-Pierre. *Building the Canadian S&T Information Infrastructure*; a presentation, 2003

It is recommended that the Committee of Federal Science ADMs:

1. Sponsor a Treasury Board Submission requesting \$41.8M in transition funds over a period of five years; and
2. Approve the creation of the Federal Science eLibrary consortium to govern the acquisition and delivery of STM e-journals.

Further recommendations:

3. As soon as possible, the Strategic Alliance should expand its membership to include all departments and agencies that need access to STM information in order to ensure maximum return to the government on the investment requested and to strengthen the value proposition for new funds.
4. As soon as the consortium has been established, it should seek a formal agreement with the Canadian National Site Licensing Project (CNSLP) to further leverage economies of scale and expertise.
5. A sustainable funding model that will provide continued financial stability should be developed in year five of the program.

## ANNEX 6. BACKGROUND DOCUMENTS

CISTI. *Environmental Scan Policy*; internal report 2005–2010 CISTI Strategic Planning; Ottawa **2004**.

CISTI. *Industry and Market Scan*; internal report NRC 2005–2010 Strategic Planning; Ottawa **2004**.

CISTI. *Technology and Programs*; internal report Strategic Planning; Ottawa **2004**.

Dollinger, Doug. *CISTI's Capability Assessment*; internal report; Ottawa **2004**.

OCLC. *Environmental Scan: Pattern Recognition*; a report to the OCLC membership; Dublin, Ohio **2004**

Outsell; *Financial Performance Scorecard, Third Quarter 2003; Continuing Growth with Growing Disparity*; Volume 7, January 23, **2004**.









