



# CFI Platform Outcome Measurement Study (POMS)

## Expert Panel Report

CANADIAN RESEARCH KNOWLEDGE NETWORK

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## Lexicon

Acronyms used in report	
APCs	article processing charges
AUCC	Association of Universities and Colleges of Canada
CARL	Canadian Association of Research Libraries
CFI	Canada Foundation for Innovation
CNSLP	Canadian National Site Licensing Project
CRKN	Canadian Research Knowledge Network
EP	Expert Panel
HQP	highly qualified personnel
LIM	License Information Module
O&M	operation and maintenance
POMS	Platform Outcome Measurement Study
SMEs	small and medium enterprises
VITaL	Value, Influence, Trends and Leadership

# Platform Outcome Measurement Study (POMS)

The CFI is grateful for the support and participation of the Canadian Research Knowledge Network (CRKN) and its members in the Platform Outcome Measurement Study (POMS) and also wishes to thank the Expert Panel (EP) members for their time, expertise and many contributions to this report.

In December 2012, the CFI assembled a panel of experts to assess the activities and achievements of CRKN and evaluate the degree to which the investment of the CFI and its partners has had a transformative impact on Canada's research landscape and is contributing to the CFI's meeting its objectives.

The assessment was based on a new tool in the CFI's suite of evaluation activities — POMS — developed specifically for large-scale, specialized or multi-purpose research infrastructure that support the Canadian research community.

An in-depth report prepared by CRKN captured, with numbers and narrative, the outcomes and impacts of the Network. The confidential self-report, which also highlighted key organizational dimensions (e.g. governance, management, human resources), was provided to the EP. A visit by the group of experts allowed the members to gain additional insights about the activities and outcomes of CRKN and how they relate. On the basis of the self-report and visit discussions, the EP assessed indicators of progress and outcomes (generally using a scale: High, Medium or Low), provided rationale for its decisions and highlighted key contributions and impacts of CRKN.

This report summarizes the assessment, findings and conclusions of the EP.

## Members of the EP

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The CFI would like to acknowledge the participation of the following representatives of CRKN and its members at the EP visit:

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## Key findings

CRKN is among the leading information-enabling organizations worldwide and is recognized as a “game changer” for the Canadian research community.

- The number of members and the number of licence agreements have increased through the life of CRKN.
- CRKN has enabled universities of all sizes and in all regions to have access to the same licensed content. Similarly, CRKN’s licensing activities support research and training in all disciplines.
- CRKN’s activities underpin high-quality university research and teaching, but the Network is largely invisible to its end-users.
- CRKN’s model licence agreement has attracted interest from around the world.

The investment in CRKN by the CFI and its provincial government partners was essential, timely and catalytic and has been returned many times over.

- The support of the CFI and its funding partners stimulated the universities and the existing regional consortia to co-operate in building a national platform with the widest scope and reach.
- Contributions made by the CFI and its partners were leveraged several times over with cumulative investments in licensed content of \$767 million over the life of CRKN.
- Through CRKN’s licence agreements with publishers, estimated savings to members have totalled \$1.43 billion since 2001.

CRKN has well-developed and efficient operations to address its current mandate; however, recent changes to the governance structure were viewed as potentially detrimental to its future.

- CRKN has evolved a mature governance structure, with comprehensive bylaws and operating policies. The planning process and interactions with members are effective, and there have been many management accomplishments. The quality of personnel is high.
- Recent changes in the composition of the Board and the abolition of an international Advisory Board as a cost-saving measure will deprive CRKN of a valued and broad-based source of expertise and advice if no alternative sources of engagement are developed.

CRKN may not have the resilience with its current level of resources to deal with the ongoing transformation in scholarly communication and the ways in which digital content is used by the research community.

- CRKN operates on a budget barely sufficient to fulfill its mandate, with resulting symptoms of organizational stress and risk adversity.
- Resource constraints threaten the capacity of CRKN to maintain a leading role as a contemporary research knowledge network. CRKN must 1) embrace innovation and risk to take advantage of emerging opportunities; 2) better convey its value proposition to university stakeholders; and 3) explore potential new sources of revenue.

## Overview of the platform

*“Collaborating for Value and Impact” — CRKN motto*

The Canadian Research Knowledge Network (CRKN) is a partnership of Canadian universities dedicated to expanding access to digital content for the academic research enterprise in Canada. It negotiates agreements with publishers to provide the best financial, access and usage terms for digital content made available directly from publishers' or vendors' sites. It concentrates its efforts on licensing content that is of broad interest and high need for researchers at member universities. CRKN's membership has increased from 64 institutions in 2000 to 75 in 2012 and includes the majority of the universities that belong to the Association of Universities and Colleges of Canada (AUCC). CRKN-licensed content represents 56 percent of total spending on digital content by the libraries of member universities. Through these libraries, digital content is available to 99 percent of university researchers and students in Canada.

CRKN began as the Canadian National Site Licensing Project (CNSLP) in January 2000, after an award of \$20 million from the CFI, which was matched by \$20 million from provincial governments and the Atlantic Canada Opportunities Agency plus \$10 million from 64 universities, for a total of \$50 million over three years. The University of Ottawa served as the project's host, and a Steering Committee oversaw all aspects of project development.

Initially, content was primarily full-text e-journals and citation databases in science, engineering, health and environmental disciplines, as these were where the needs and costs for universities were most acute.

On April 1, 2004, CNSLP was renamed CRKN and incorporated as a not-for-profit organization with an independent Board. In 2005, CRKN began a three-phase project that added content in social sciences and humanities and led to a further proposal to the CFI. In February 2007, the CFI awarded \$19.1 million from its National Platforms Fund. With matching funds totalling \$28.6 million from 67 universities and provincial governments, the Digital Content Infrastructure for the Human and Social Sciences (DCI) Project was launched, and by June 2008, 14 major research collections in social sciences and humanities disciplines had been secured. In 2009, CRKN dedicated the remaining DCI funds to digitization of unique international and Canadian historical materials for open access.

CRKN currently operates with a staff of eight. To date, CRKN has negotiated and continues to administer 52 licences with publishers and content vendors. In 2012, total content expenditures amounted to \$89 million, with operating costs of just 2 percent of its total budget. While the majority of the licensed content is journals and databases, it increasingly includes e-books, newspapers, videos, images, music and primary source material. In dollar amounts, 65 percent of the content is in science, technology and medicine and 35 percent is in the social sciences and humanities, with 97 percent English content and 3 percent French content. CRKN manages licences with Elsevier, Sage, Springer, Taylor & Francis, Wiley-Blackwell and numerous other content providers.



# 1. Operation of CRKN

## 1.1 Governance, management and advisory structure

CRKN has evolved a well-developed and mature governance structure, with comprehensive bylaws and operating policies, a clear organizational chart and standing committees or task forces that address its responsibilities and functions; for example: a Negotiations Resource Team that develops procurement strategies; an Open Access Working Group, jointly with the Canadian Association of Research Libraries (CARL), to explore sustainable open access models in a cost-effective scholarly content ecosystem; and the recent Value, Influence, Trends and Leadership (VITaL) Task Group, working to develop indicators of CRKN performance and impact.

In 2010–2011, CRKN undertook a governance review, and following consultation with key academic stakeholders, the Board was restructured in February 2012 to increase the representation of member libraries and reduce the Board size from 16 to 10 members. Among the reasons for this change were cost savings, new federal regulations and good governance practices. While this new composition is more representative of its core client group (university librarians), it is less representative of its broad stakeholder community. In addition, CRKN abandoned its international Advisory Board in March 2011 for cost reduction reasons, depriving it of a valued and broad-based source of advice.

The Board is well structured for operational purposes, but whether it is optimum to provide strategic advice is less clear. Its membership is relatively homogeneous and academic, with seven librarians and three university administrators and/or researchers. There are no external stakeholders (e.g. individuals from the financial world, industry and the public sector or international experts) to provide a global context and an expanded vision for its operations. CRKN representatives acknowledged the need to develop other forms of engagement with their wider community. This will be a focus of an upcoming review of CRKN's committee structure and composition. Stakeholder engagement was described as a “work-in-progress.” The Expert Panel (EP) recommended expanding the scope of the current community by seeking greater input from colleges, private and public sectors and international bodies.

Management and staffing of CRKN are lean and efficient, with priority appropriately on sustaining and supporting the membership. Notably, an important management transition occurred immediately prior to the EP review, with the retirement of the founding executive director and the appointment of a successor. Both participated in the EP review.

There have been many management accomplishments, such as developing the “made in Canada” licence agreement, with superior terms of access and usage for the academic community; streamlining its licence renewal processes; automating routine office processes; and developing the License Information Module (LIM), an open-source information management system that simplifies access to licence information for all CRKN agreements. The LIM has saved CRKN member libraries time and resources in the management of digital collections and has eliminated duplication of effort among CRKN members.

Interactions between the CRKN secretariat and its members, focusing on the licence renewal process, are good, with CRKN undertaking member surveys and holding regular conference calls with members to identify problems with vendors and discuss ideas for enhancing CRKN's value to members. For example, the CRKN Report to the EP showed how it had been able to raise member complaints with a specific content provider and, through the vendor's co-operation, achieve improved access to and functionality of the licensed content.

## 1.2 Platform planning process

EP rating of the effectiveness of planning and performance monitoring in platform planning

High

The Expert Panel (EP) recognized that the planning process at CRKN was effective. There had been several iterations of a three-year strategic planning cycle, with the most recent cycle being 2010–2012. The planning cycle for the 2013–2015 Strategic Plan is approaching its conclusion. The planning process is intended to ensure that CRKN's activities are based on the needs of its members and also take into account major external trends. It is distinguished by a preliminary and exhaustive communications outreach process, including surveys, focus groups and meetings with regional library consortia, to capture members' and stakeholders' views about current services and future needs. Notably, CRKN won an international business award for its 2010–2012 Strategic Planning process.

Performance measurement was less advanced than the planning function, and there were major gaps in the historical records of usage. CRKN representatives noted that with their limited resources, they have had to collect statistics on an "as needed" basis; for example, before an evaluation, rather than on a continuous basis. However, the formation of the VITaL Task Group has recently helped CRKN improve its monitoring, and since 2010, CRKN has systematically collected information on membership leverage, scholarly content offerings and community engagement, according to a framework developed by the VITaL Task Group. The EP expects that there will be continued improvements in measuring usage of the electronic literature enabled by CRKN, noting that improved statistics would be very valuable to CRKN members in making rational decisions about their journal subscriptions.

EP rating of the impact of the platform's planning process on the evolution of the platform and its user community since the first CFI investment

High

The impact of the planning process was demonstrated by several CRKN successes, particularly the continued increase in membership. Membership of university research institutions is essentially complete, and no members have ever left the Network. In addition, a second application for CFI funding in 2006, resulting from CRKN planning, was successful and has resulted in a quantum increase in access to serials in the social sciences and humanities (see arrow, Figure 2, page 12).

EP rating of the extent and suitability of stakeholder involvement with the platform

Medium

With respect to stakeholder involvement, CRKN representatives pointed out that beyond the periodic consultations around strategic planning, the five volunteer task groups are an important vehicle for engaging members and stakeholders in CRKN's planning activities on a continuous basis. These task groups are commissioned to assist the Board as specific issues arise, some in collaboration with appropriate partner organizations. There is evidence that the task groups reached closure on the issues they explored and achieved their mandates. For example, the Perpetual Access Task Group recently delivered its report to the Board, which is considering the feasibility of implementing its recommendations.

There are additional opportunities for interactions with members and stakeholders, including conference calls with members to provide information and answer questions regarding new or renewal licences, ad hoc meetings with regional consortia to identify which licences are in the national interest and CRKN's Annual General Meeting, which is highly valued for collaboration, educational and networking purposes by the 100 to 200 participants.

The "Medium" rating for stakeholder involvement reflects the EP's concern about the potential for reduced stakeholder involvement following the recent governance changes (Section 1.1), a risk acknowledged by CRKN representatives as requiring attention. The challenge for CRKN now is to seek out additional non-university members and their associated financial support and thereby achieve full coverage of institutions and users of research publications.

The EP perceived that there was a lot of good planning going on but less innovation and risk-taking: Sometimes risk-taking is needed to accomplish innovation. There are plenty of emerging opportunities for pan-Canadian collaboration in the management of research knowledge, such as collection analysis, collective negotiation of open access fees (see below) and centralized print repositories.

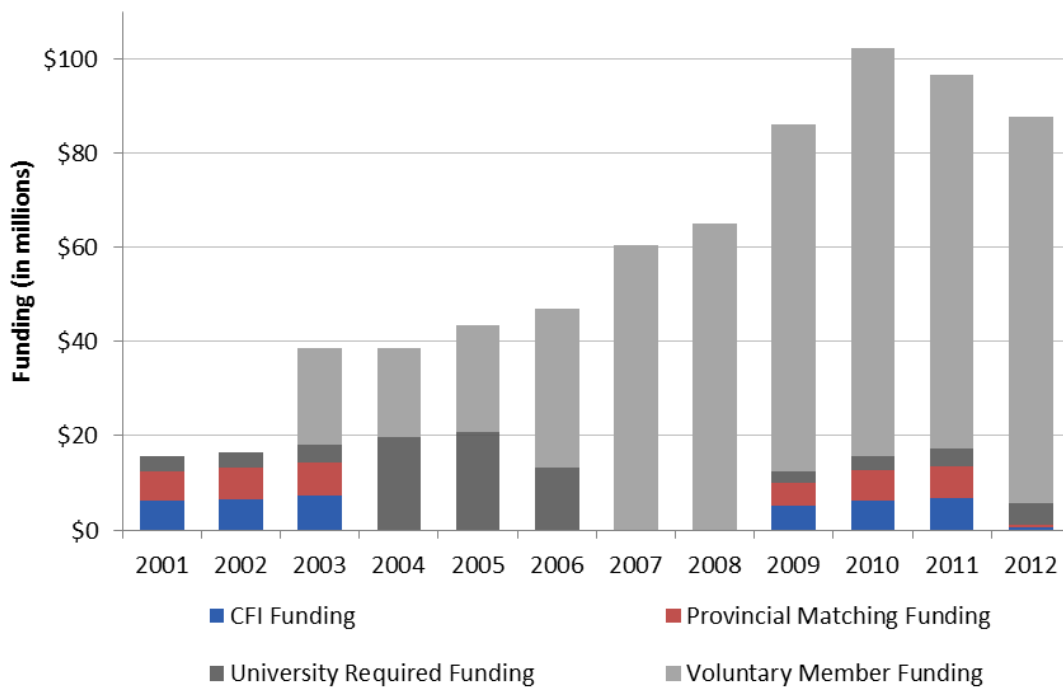
### 1.3 Capital investment value

EP rating of the adequacy of the platform enhancements since the first CFI investment (to keep platform offerings up to date)

High

Interpreting capital investment as the purchase of licences, the leverage of the CFI and partner contributions has been enormous. The funders' early investments (in 2001–2002) were significantly leveraged over the past decade. During years without ongoing CFI funding, CRKN's operations and purchases of licences were entirely supported by member contributions (see Figure 1). Even in those years of full operations, when the CFI and partner funds were available, that funding was a minority of the total budget, and additional support by CRKN's members greatly enhanced the content that CRKN could purchase. Collectively, the funding provided by the CFI and partners, which amounted to \$97.7 million across two projects, was leveraged nearly eight times, with total cumulative investments of \$767 million (adjusted to 2012 dollars) since 2001.

Figure 1 CFI Seed Money Leverages Sustained Investments



Source: CRKN Report to the EP

#### 1.4 Operation and maintenance (O&M) investments

As previously mentioned, CRKN is a shoestring operation, with a staff of eight and an operating budget that was \$1.5 million in 2012, representing less than 2 percent of its budget. The major source of the O&M budget is the membership (operations) fees, which must be distinguished from the contributions that institutions make toward the cost of content licences and which are a “flow through” to the publishers (see Table 1).

Table 1 CRKN 2012 Budget

Income		Expenditures	
Licence fees:	\$93,857,000	Licence purchases:	\$93,857,000
Operations fees:	\$916,000	Operating costs:	\$1,516,000
Interest and other income:	\$197,000	Amortization of capital assets:	\$199,000
		<b>Deficit</b>	<b>\$602,000</b>

Source: 2012 Annual Report

Although CRKN has been able to meet the needs and expectations of its membership by maintaining and also improving the efficiency and value of its services — for example, through the development of the License Information Module (see page 7) — one CRKN representative at the site meeting described its operational capability as “stretched since 2007.” This individual

noted how difficult it was both to enhance the value for money that members received from licensing agreements and to prepare for the changes that were occurring in the world of data production and scholarly communication. It was also the view of the Expert Panel (EP) that management and staff may be questionably sufficient for current operations and too lean to face the opportunities and challenges ahead. The EP members were amazed when informed of the low cost of membership, which ranges from \$3,677 to \$31,519 annually, depending on the size of the university. CRKN has been operating at a deficit for the past two years (see Table 1), so it is the opinion of the EP that if CRKN is to survive, the membership fees will have to increase unless new funding opportunities from governments arise or other sources of revenue are sought and secured.

## 1.5 Platform capabilities and sustainability

*“To date, CRKN has negotiated and continues to administer 52 licences with total content expenditures of \$89 million in 2012. This represents approximately 56 percent of all academic library expenditures on electronic content in Canada.” — CRKN Report to the EP, from CARL statistics 2010–2011*

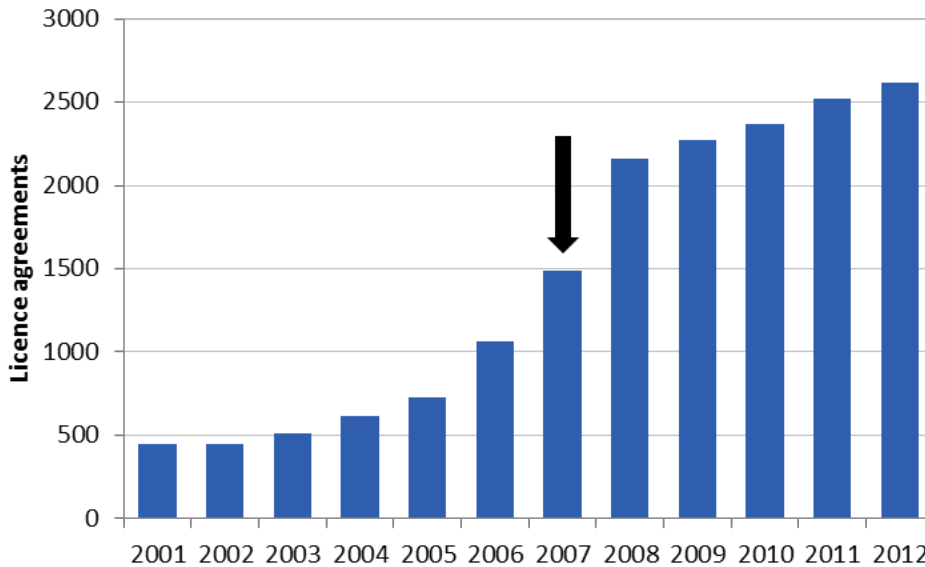
EP rating of the platform capabilities

State of the art

CRKN does not manage physical infrastructure itself but, rather, negotiates the conditions for access to digital content hosted by scholarly publishers and vendors. During licensing negotiations, CRKN aims to secure all the conditions set out in its model licence in order to provide the most flexible-use environment for researchers and students. From 2001 to 2012, the number of licence agreements managed by CRKN increased more than fivefold (see Figure 2). Currently, CRKN manages 52 licences with publishers and content vendors as well as 2,616 individual agreements across the membership; this is up from 33 licences across 1,487 agreements in 2007, when the CFI and its partners announced their second contribution to the Network (see arrow on Figure 2).

In terms of negotiating licences with publishers, the Expert Panel (EP) members stated that CRKN is the equal of other leading international organizations with similar mandates with which they are familiar, and it was the envy of the member from the United States. A survey conducted in 2012 revealed a high level of satisfaction with the services CRKN provided to its members, even higher than that reported in a similar survey conducted in 2009.

Figure 2 Licence Participation



NOTE: Arrow indicates second CFI grant  
 Source: CRKN Report to the EP

As emphasized in the CRKN Report to the EP, it is important to recognize that CRKN's growth has been both quantitative and qualitative, due to the evolution of digital technologies as applied to different media beyond the traditional written word. When it began, the digital information licensed by CRKN was primarily e-journals and citation databases. Newer digital technologies, such as streaming audio and video with interactive Web 2.0 capabilities, now enable new research approaches and increase the complexity of CRKN's business.

EP rating of the capacity and quality of platform personnel

**Medium**

The quality of personnel is high, and CRKN's standards are rigorous. The "Medium" rating is absolutely not a reflection of staff competence but of the stresses under which they work, such as frequent deadlines for negotiations, the amount of member funds involved and a rapidly changing academic publishing environment. All Member Services staff have a master of library science degree, and their jobs are high pressure and subject to constant change. There is a limited training budget but not many opportunities for training, though staff do attend professional conferences. Owing to these job stresses and the competition in the Ottawa region for such highly qualified staff, stability of staffing is an issue. This is doubly important for an organization whose ability to negotiate favourable terms is likely to be helped by the building of trust and familiarity between representatives of the publishers and CRKN staff. The EP recognized that the few CRKN personnel are supplemented by the expertise of its members who volunteer to serve on working groups. For example, the Negotiations Resource Team, which consists of 10 member librarians, assists staff negotiators and monitors the execution of agreed-upon negotiations strategies.

Sustainability has been an ongoing challenge for CRKN. It has been operating at a deficit for the past two years and, to deal with this, has reduced operating costs (governance review, change in office location) and developed a multi-year financial model to manage the deficit. Considering the remarkable benefits members obtain from the Network, the EP could not understand why the support provided by the CRKN membership was so parsimonious as to compromise its existence. Perhaps this is because, as a CRKN representative noted ruefully, even if CRKN delivers the same savings to institutions year after year, its perceived value gradually decreases because members notice only the annual increases in subscription costs and forget how bad things were before CRKN existed or how much more costly it would be for them if CRKN did not exist.

The EP suggests that the value proposition for CRKN may not have been adequately conveyed to stakeholders, above all to the most senior administrators in the nation's universities. The transition in leadership was viewed as an opportunity for the new executive director to tour the major universities, listen carefully to the expectations university leaders have for profiting from changes in the generation and use of digital research information and remind them of the benefits and potential of CRKN to assist universities in dealing with the challenges of the rapidly evolving business models for scholarly communication, such as open access, discussed in more detail in Section 4, "Challenges."

Through its Finance and Audit Committee, CRKN has explored other sources of revenue and operational efficiencies, as well as ways to further increase its value to members. One interesting idea is the use of futures contracts to minimize exposure to fluctuating currency exchange rates, reducing financial risk to publishers, which helps in negotiating more favourable terms. An enhanced statistical service provided on a for-fee basis might be of value to members. Integrated, standardized measures of access and use are badly needed. Increasing the number of members would also increase operating revenue; however, as discussed in Section 2.2, these would have to be recruited outside the fully participating university sector. It might also be reasonable to charge new members an initiation fee in recognition of the existing members' previous investment in the establishment of CRKN and its well-functioning operations.

CRKN might consider commissioning a thorough analysis of its economic benefits. Following the EP meeting, the author became aware of an economic-impact analysis of a data provision and management service in the United Kingdom<sup>1</sup> that could serve as a model process for CRKN.

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<sup>1</sup> Economic Impact Evaluation of the Economic and Social Data Service. March 2012. Available at: [http://www.esrc.ac.uk/\\_images/ESDS\\_Economic\\_Impact\\_Evaluation\\_tcm8-22229.pdf](http://www.esrc.ac.uk/_images/ESDS_Economic_Impact_Evaluation_tcm8-22229.pdf). Accessed 2012-12-08.

## 1.6 Leadership and competitiveness

*“No country has done a better job of national licensing of research literature than the Canadian Research Knowledge Network. Recently, I have been suffering from ‘Canada envy.’ If you want to see how a national information system can be transformed to support research progress and economic development, I say: Watch Canada!” — Ken Frazier, Director (retired), General Library System, University of Wisconsin-Madison, in CRKN Report to the EP*

EP rating of the overall competitiveness of the platform in the international context based on its leadership, reputation and other relevant benchmarks

**International level**

CRKN has attracted interest from around the world, and its model licence agreement is also used outside Canada. CRKN and several of its staff have received an impressive series of national and international awards for excellence and innovation. The Expert Panel (EP) members who are knowledgeable about similar platforms internationally considered CRKN on a par with other leading networks in terms of its services and capabilities. The prices for licences that CRKN has negotiated seem to be highly competitive with what universities in similarly research-intensive nations pay. However, it was noted that some networks are more innovative than CRKN appears to be and less severely constrained by resource limitations. Yet the EP recognized that comparisons with like organizations are difficult, because each has a different range of responsibilities for a different range of clients and is embedded in a unique national research environment.

## 1.7 Linkages

EP rating of the impact of the convening and planning activities of the platform

**Medium**

The major impact of CRKN's planning and convening activities has been on its immediate clients and members, the university libraries, and this includes coordination of licence purchases at the national, regional and institutional levels (see below) so that CRKN influences the entire electronic publication acquisition by Canadian universities, not just the content for which it negotiates licences directly. CRKN also participates in national initiatives such as the Canadian Access Federation, managed by CANARIE, and internationally, it is an active participant in the 200-member International Coalition of Library Consortia. The Expert Panel (EP) considered the impact of these activities to be as expected and appropriate for CRKN's scope and mandate.

EP rating of the extent to which the platform has established and fostered collaborative relationships

**High**



The task forces established by CRKN are an important way of bringing its clients together, and broad representation is made easier by the parity of access to research information fostered by CRKN's negotiated agreements. There is interaction with peer organizations through attendance of CRKN staff at conferences, and staff participate in the International Coalition of Library Consortia, helping to build a network of colleagues internationally and allowing CRKN to both contribute to and learn from cognate organizations. CRKN recently signed co-licensing agreements with the United Kingdom's JISC Collections and the Center for Research Libraries in the United States.

In addition to the national CRKN, there are four regional library consortia (Conférence des recteurs et des principaux des universités du Québec; Council of Atlantic University Libraries; Council of Prairie and Pacific University Libraries; and Ontario Council of University Libraries), which predate the establishment of CRKN, and all CRKN members are also members of one of the regional library consortia. The EP explored the relationship between CRKN and the regional library consortia. It was explained that this was mutually supportive. For example, in licensing content of regional interest, the regional consortia made use of the CRKN model licence. Dialogue between the regional consortia and CRKN ensured there was no duplication of licensing activity, and collectively, the consortia and CRKN were monitoring which licences would be more appropriately devolved to a regional consortium or escalated to CRKN. There are also ongoing discussions about services that could be better provided at the regional or national level; for example, the possibility of a national network of print repositories.

## 2. Impacts of CRKN

### 2.1 Foregone costs

*“Since its inception, CRKN has purchased more than \$767 million (in 2012 Canadian dollars) of content on behalf of its member institutions. Estimates suggest that if CRKN-licensed content were acquired on an institution-by-institution basis, the cost to CRKN members would be nearly \$2.2 billion over the same time frame.” — CRKN Report to the EP*

EP rating of the benefits of foregone costs to the academic research community and funders

High

Compelling data were presented in the CRKN Report to the EP, documenting massive savings in licensing costs to institutions. For example, the price negotiated by CRKN for the recent renewal of licences from two important publishers, Swets and Elsevier, was \$88.6 million compared with the vendor price of \$181.3 million outside the Network. It was estimated generally that if members had to negotiate individually for content licences, the cost would be twofold to threefold greater than the cost to CRKN and that savings to members totalled \$1.43 billion over the life of CRKN. This is an exceptional return on the CFI’s and its partners’ contributions, which totalled \$97.7 million in the two tranches of funding.

The Expert Panel (EP) noted that there are always challenges in estimating the value of foregone costs and asked whether the calculation of foregone costs in the CRKN Report to the EP was based on publishers’ list prices for licences, which nobody pays, resulting in an exaggeration of the benefits of CRKN. The EP was told that these estimates were based on realistic prices the institutions would expect to pay if negotiating the licences individually and were, therefore, reliable estimates of foregone costs.

There are also further significant savings to each member institution because it does not have to hire as many staff to conduct its own negotiations or can redirect staff time to other valuable duties. One university representative noted that if his university had to negotiate independently with the publishers, it would require two full-time staff. Another pointed out that her university obtained 30 licences through CRKN and that its operation fee to support CRKN was only \$15,000 annually, far less than the salary of the licensing negotiator it would need in the absence of CRKN. In addition, the estimated licensing cost savings for this university were \$4 million per year. This represents extraordinary value for money, and it is not surprising that there has never been a defection from CRKN. Some libraries have used the costs saved in the licensing agreements to increase the number of titles in their collections. Thus CRKN is not only about cost savings but also about improving the range of accessible material (see also the example cited in Section 2.3).

## 2.2 Expansion of access and usage

*“Canadian university researchers increasingly find themselves at the centre of [research] networks, acting as ‘information gatekeepers,’ because in many instances, they have access to a larger body of information than their colleagues at universities in many other parts of the world.” — cited in CRKN Report to the EP<sup>2</sup>*

A 2004 survey<sup>3</sup> found that CRKN (CNSLP at that time) allowed a 436 percent increase in access to journals. In other words, researchers at a hypothetical institution that previously held 100 titles had gained access to an additional 436 journals, thanks to CRKN.

One CRKN representative explained to the Expert Panel (EP) the impact on a leading research university library. In the early 1990s, the library subscribed to about 15,000 serials and had good access to citation databases but no electronic content. By 1999, budget cuts and increased subscription costs had forced the number of serials down to about 10,000 titles, with no capacity to purchase digital content. The collection now numbers 68,000 titles, of which 75 percent are delivered electronically. Admittedly, the acquisitions budget has doubled as a result of the expansion of the university. Nevertheless, a doubling of budget has resulted in a sevenfold increase in titles, thanks to CRKN-negotiated savings in subscriptions that could be applied to the purchase of more serials.

EP rating of the suitability of the platform's access policies and procedures	High
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Securing the best possible access has been a key feature of CRKN's licensing negotiations and its model agreement. This ensures 24/7 access on or off campus and permits use of content for course materials. The model agreement has also been of benefit to individual institutions and the regional consortia as they negotiate their own licence terms.

EP rating of the evolution in the size and distribution of the platform's potential user community	High
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EP rating of the extent to which the user community supported by the platform is geographically distributed	High
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Over 1.2 million users benefit from CRKN's services, including students, staff and more than 42,000 full-time faculty members, and there has been steady growth (3 to 5 percent per year) in these numbers during most of CRKN's existence. Content made accessible through CRKN's

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<sup>2</sup> The Impact Group. April 2011. CRKN Outputs and Impacts: Findings of Four Focus Groups With the Research Community. Available at: <http://www.crkn.ca/sites/default/files/file/CRKN%20Focus%20Group%20Report%20w%20Researchers%202011.pdf>

<sup>3</sup> The Impact Group. April 2004. Impact of the Canadian National Site Licensing Project: A Report to Partners and Stakeholders. Available at: [http://www.crkn.ca/sites/default/files/about/Impact\\_Final\\_Report\\_Apr04.pdf](http://www.crkn.ca/sites/default/files/about/Impact_Final_Report_Apr04.pdf)

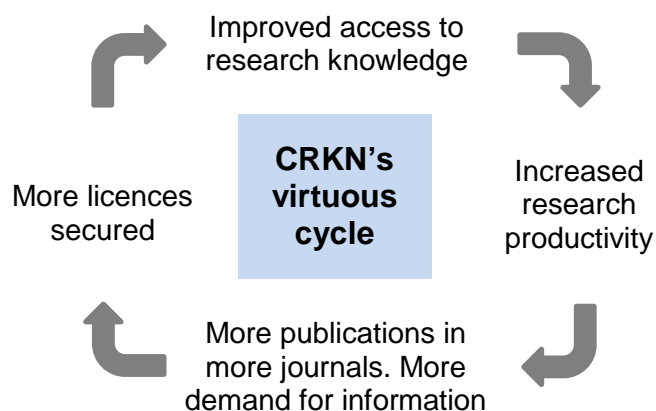
licensing activities now covers all disciplines, with recent emphasis on expansion into the social sciences and humanities. Its 75 members include all the research-intensive and undergraduate universities in Canada, anglophone and francophone alike.

EP rating of the extent of utilization of the platform and its services in relation to its capacity and performance targets

High

CRKN noted that it had difficulty in collecting comprehensive usage data. It compiled statistics from some publishers from 2001 to 2004, but between 2005 and 2008, it did not have the staff to manage the data. It began receiving more comprehensive statistics from all publishers only in 2009. However, available data show that utilization has increased rapidly (a tenfold increase in downloads per researcher for articles published by the largest scientific publisher between 2002 and 2007). Usage may have stabilized in some areas in recent years since all the major serials are now available, the user community has expanded to include virtually all areas of scholarship and all regions with post-secondary institutions are covered. In addition, both research funding and the number of researchers in Canada are not increasing at the same rate as they were during the 2000s.

Figure 3 CRKN Virtuous Cycle



The platform seems to be fully utilized, relative to its staff capacity, and may be overcapacity, as previously discussed. To some extent, CRKN's growth has been driven by its own success, since it establishes a virtuous cycle (see Figure 3) that raises expectations for ease of access, scope and scale of licence agreements and augments its workload. Although the university sector membership is essentially complete, there is potential for further growth in membership, with the community colleges and health-care providers unaffiliated with a university as major untapped client groups.

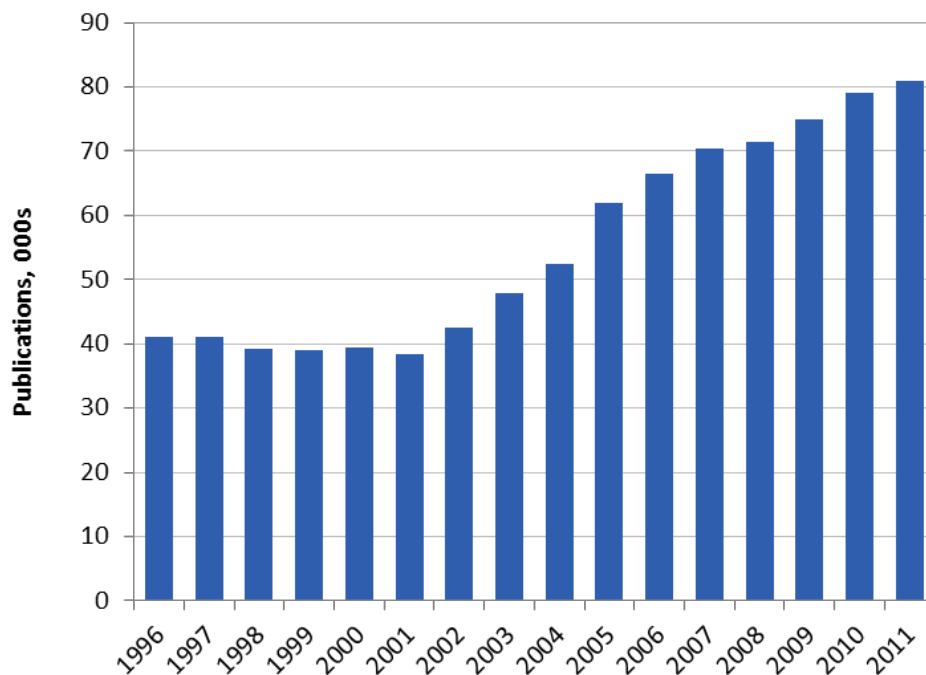
## 2.3 Research enabled

EP rating of the platform's impact on the quantity and the quality of research enabled

High

The work of researchers across the country and in all disciplines has been profoundly impacted by having ready access to a broad range of research information. The quantitative increase in Canadian publications over the years that CRKN and its predecessor, CNSLP, have operated (see Figure 4) is suggestive quantitative evidence of its impact, but multiple other factors, including increased research funding and growth of the research establishment, have combined to produce this increase.

Figure 4 Canadian Publications, All Fields



Source: SCImago (Scopus data)

While it is an intuitive conclusion that access to research literature will improve the quality of Canadian research, it is not easy to demonstrate a specific, generalized improvement that can be attributed to CRKN. A study<sup>4</sup> conducted in the United Kingdom and cited in the CRKN Report to the EP found that *“use of e-journals is strongly and positively correlated with papers published, numbers of PhD awards and research grants and contracts income.”* In its Report to the EP, CRKN offered several examples, across a range of disciplinary and interdisciplinary

<sup>4</sup> Research Information Network. April 2009. E-journals: their use, value and impact. Available at: <http://www.rin.ac.uk/our-work/communicating-and-disseminating-research/e-journals-their-use-value-and-impact>. Accessed 2012-12-09.

research, pointing to improved quality of research. In addition, the Expert Panel (EP) heard first-hand from the researcher member of the Board a convincing example that helps to validate the intuitive conclusion.

Dr. Ray Siemens, Canada Research Chair in Humanities Computing and distinguished professor in the faculty of humanities at the University of Victoria, spoke via phone about the way that CRKN-enabled access to content has revolutionized his work in the digital humanities, leading to innovation in traditional research approaches and allowing his research group and collaborators to address new questions. CRKN helped his team gain full access to its licensed materials and assemble large integrated disciplinary knowledge bases that could be used for data mining. His goal is to understand how researchers access and use electronic resources so that he can design better tools for discovery and analysis of humanities texts.

*“Canadian researchers are now seen as being so well connected to current sources of information that they have become magnets for international collaboration.” — cited in CRKN Report to the EP<sup>5</sup>*

Even if hard to quantitate, CRKN’s impact on research collaboration can reasonably be inferred. Although Canadian research has always been strongly collaborative, international collaboration has increased significantly over the past decade. In 2001, 30 percent of all Canadian publications were international collaborations, and that rose to 45 percent in 2011 (Scopus data).

In summary, CRKN’s activities have leveraged the investments made over the past 15 years by both levels of government in strengthening university research.

## 2.4 Contributions to the training of highly qualified personnel (HQP)

EP rating of the impact of the platform on increasing or sustaining the training of HQP since the first CFI investment	High
EP rating of the impact of the platform on quality of training (e.g. through access to state-of-the-art facilities, data that would not otherwise be available and interactions with peers and users from other institutions)	High

According to the Association of Universities and Colleges of Canada (AUCC),<sup>6</sup> enrolment of undergraduate and graduate students at Canadian universities increased from 700,000 in 2000 to over 1.2 million in 2011. Approximately 99 percent of the students enrolled in AUCC member

<sup>5</sup> The Impact Group. April 2011. CRKN Outputs and Impacts: Findings of Four Focus Groups With the Research Community. Available at: <http://www.crkn.ca/sites/default/files/file/CRKN%20Focus%20Group%20Report%20-%20Impacts%20and%20Outcomes%202011.pdf>

<sup>6</sup> Association of Universities and Colleges of Canada. 2011. Trends in higher education. Volume 1: Enrolment. Available at: [www.aucc.ca/\\_pdf/english/publications/trends\\_2007\\_vol1\\_e.pdf](http://www.aucc.ca/_pdf/english/publications/trends_2007_vol1_e.pdf)

institutions are enrolled in CRKN member universities. Notably, the number of graduate students with access to CRKN-licensed resources has risen steadily since 2001. Currently, over 192,000 of these students are graduate students who require access to the most current research literature as part of their training and thesis production. Results from several surveys conducted during the life of CRKN show that having access to online information improves both the quality of teaching and the range of student learning experiences, including the type of research that graduate students can pursue. CRKN's model licence permits the reproduction of research articles in coursework, bringing an appreciation of the power and limitations of evidence to enrich the education of legions of undergraduates. Allowing undergraduates to access the original research literature motivates them to become involved in research themselves. CRKN has also increased accessibility to a greater range of publications, particularly in small institutions, and has therefore had a positive effect on the quality and scope of training of HQP at all stages. It is not possible to quantitate the magnitude of this impact.

With respect to training within the professional library community, CRKN has set up a Community of Practice focused on licensing issues to educate those who have to negotiate licences on behalf of individual institutions or regional consortia. Through the Community of Practice, expertise in the area of collections and acquisitions has been developed across Canada.

## 2.5 Cultural, organizational and structural change enabled at stakeholder institutions

*“CRKN has brought HUGE value to our library. From its very inception, CRKN has allowed us to greatly expand the range and depth of scholarly content that we provide to our academic community.” — from the CRKN Report to the EP, quoting a respondent to the 2012 member satisfaction survey.*

EP rating of the impact of the platform on activities and services at stakeholder institutions

High

The Expert Panel (EP) noted that the overall goals of CRKN and its realized impact are well aligned with Canadian values. The licensing agreements allow for parity of access across institutions of all sizes and in all regions of the country, allowing small- and medium-sized universities access to a world-class collection of digital content on a par with the large research-intensive universities, helping all institutions to recruit and retain high-profile researchers. Although the initial focus was on science, technology and medicine, the social sciences and humanities are now also well served. CRKN's achievement is all the more remarkable because the Network has established a national platform involving post-secondary institutions that are under provincial jurisdiction and has also accommodated the needs of the two official languages. CRKN has fostered a spirit of co-operation among universities and with and among regional consortia, and the universities have responded to the opportunity to join CRKN because of the evident benefits of membership, as expressed by Tom Sanville of LYRASIS (a

U.S. library consortium): “CRKN is providing the necessary means to achieve a level of cost-effectiveness, control and expanded information access that individual libraries cannot hope to achieve individually.”<sup>7</sup>

There is some differentiation in benefits of CRKN membership between large and small universities. While the cost savings to members resulting from CRKN's negotiation of licences are greater in dollar terms for the large institutions, the benefits in terms of access to research information are proportionately greater for the small institutions, which, thanks to CRKN, have access to a far greater range of serials than would be possible if they had to negotiate individually or even as regional consortia.

Katherine Schultz, former vice-president of research at the University of Prince Edward Island (UPEI), pointed out to the EP that CRKN has conquered geographical limitations. The ability of researchers at UPEI to have 24/7 access to the world research literature was an important factor in this geographically isolated university's being able to increase its research grant and contract income sixfold over the life of CRKN and helped UPEI to welcome the National Research Council Institute for Nutrisciences and Health to its campus. This small university has also been able to attract a Canada Excellence Research Chair, and in Dr. Schultz's opinion, that would never have happened without the access to the electronic literature that CRKN enabled.

While this perception of differential benefit to institutions large and small represents a potential rather than actual strain within CRKN, it must be kept in mind when considering innovations that may be of greater benefit to institutions of a certain size.

EP rating of the impact of the platform on how research is done in the discipline(s)/field(s) it supports	High
EP rating of the impact of the platform on Canada's international visibility	Medium

It is impossible to determine CRKN's impact on the reputation of the Canadian academic research enterprise in isolation, though access to digital content is as vital to research as is electricity or running water. It is important to note that CRKN has done more than lowering the cost of access to e-journals. It has also secured favourable terms that maximize the accessibility and utility of digital information. CRKN has allowed more researchers to access more information more easily and rapidly and to monitor more information within and across more fields more efficiently than ever before. Researchers have access to an expanded range of online information within their disciplines and are using strategies such as preprogrammed information searches to obtain up-to-the-minute information about research advances in their fields and across other possibly relevant fields that they previously would have been unable to monitor. The CRKN Report to the EP provided an excellent example of how digital information can facilitate knowledge transfer across disciplines. Dr. Cristian Suteanu, associate professor in the geography department and environmental science program at Saint Mary's University in Halifax, is studying river flows. When he used the digital research content licensed by CRKN to

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<sup>7</sup> Quote by Tom Sanville, director of licensing and special projects at LYRASIS, from CRKN Report to the EP.



search for information on fluid flows related to rivers, he uncovered a cardiology paper which contained a scientific approach relevant to his own work and which he has now incorporated into his methods. Without this access, he would not have made the connection between river flow and blood flow that has improved his research approach.

This immediate access to the 95 percent of research findings obtained outside Canada will have a multiplicative impact in combination with the other significant investments made in research support by federal and provincial governments over the life of CRKN, but neither the EP nor the CRKN team was able to quantitate this impact on international visibility; therefore, the EP was reluctant to categorize it as “High.”

## 2.6 Extrinsic benefits: Impact on local, regional and national innovation

*“Digital content is a critical component of a digital economy. CFI’s investments in CRKN, therefore, have contributed to the development of a robust national digital infrastructure and towards fostering a vigorous digital economy in Canada.” — CRKN Report to the EP*

EP rating of the amount of knowledge translation and transfer catalyzed by the platform	Medium
EP rating of the importance of socio-economic benefits catalyzed by the platform to Canada and Canadians	High

The major focus of CRKN’s efforts to secure improved access to the research literature has properly been the university community. But the inclusion of “walk-in” users in CRKN’s model agreement permits access to the research literature by anybody within proximity of a university library. This is an understated but significant CRKN achievement and an important potential contribution to translating knowledge from the academic to the broad public domain. However, the relationships between the platform (licensing content) and the end-users of knowledge derived from university research (health, technology, environment and broad socio-economic benefits) are multi-dimensional, indirect and well beyond CRKN’s direct influence. The Expert Panel (EP) recognized that the impact of CRKN outside academia might be underestimated, especially in regions served by the small universities whose digital collections have been expanded the most.

The extent to which member universities publicize this public access opportunity to their local communities is variable. As an example of good practice, the University of Waterloo has established the Industrial and Business Information Service to provide an accurate, reliable and timely service at a reasonable cost to meet the information needs of businesses, industry and other individuals outside the academic community. Another example of a deliberate attempt by CRKN members to support knowledge-translation activities is the Irving K. Barber Learning Centre at the University of British Columbia, which offers a broad range of programs and services that support teaching and learning, as well as lifelong learning and community engagement, through the development of partnerships between the university and the wider

community. In addition, the two digitization projects supported by CRKN's Digital Content Infrastructure for the Human and Social Sciences (DCI) Project are open access.

The EP discussed with CRKN representatives the opportunities for improving access to the research literature for small and medium enterprises (SMEs). It was pointed out by CRKN that many SMEs retain links to the university where the intellectual property they are exploiting has been developed (e.g. through adjunct appointments), in which case access through the university library is available. However, there are situations where this option is not available, and the high fees demanded by publishers for "pay-per-view" access to single articles (generally in the range of \$35) make them unaffordable for struggling SMEs. Institutions in all parts of the country now have better access to a wider range of serials, so if university libraries could provide better access for SMEs, under favourable CRKN licence terms, this could facilitate the work of research and development clusters and support regional economic development.

The EP rated the importance of the broader socio-economic benefits resulting from CRKN as "High" because of its essential underpinning of the university research enterprise, as amply discussed in preceding sections.

### 3. Influence of the CFI and its funding partners

EP rating of the impact of the CFI in enabling acquisition and/or enhancement of the platform and the associated capabilities

High

Described as a “game changer” by one member of the Expert Panel (EP), CRKN would not have happened without the CFI’s support, which provided sufficient funding to get the partners committed to the Network. The impact of the CFI and partner funding was also a result of perfect timing. It came at the right moment to lower university libraries’ e-journal entry costs and the associated risks of moving to electronic collections and made it easier for libraries to justify an increased university investment in the required electronic information delivery infrastructure. The CFI also persuaded the pre-existing regional consortia (Section 1) to collaborate in realizing the vision of a single national licensing authority.

The most important CFI decision was to recognize that research literature is infrastructure, which is just as vital to high-quality research as are buildings and state-of-the art apparatus. That was a prescient policy decision in the early days of the CFI, one which has been vindicated by the subsequent rise of research approaches that require “big data” and their computerized analysis. The significance of the CFI’s foresight becomes ever more apparent as secondary use of data, through data mining and other associative strategies, is increasingly utilized to generate new knowledge and reveal hidden relationships.

Without CFI funding, it is likely that the four regional consortia would now be operating independently and duplicating licence negotiations, large universities would be paying more for their subscriptions and small universities would have far less complete collections. The CFI’s insistence on a national approach to licensing was critical in ensuring that Canadian researchers have the maximum access to information for the minimum cost. Canada is a small nation in terms of its resources for supporting research and scholarship and must avoid duplication of effort. CRKN is a splendid example of the value of a national approach to fundamental research needs.

## 4. Challenges

*“The evidence is compelling: CRKN has done a fantastic job of fulfilling its mission. But it is severely underresourced to deal with the changing technologies of scholarly communication.” — EP member*

Over the years when electronic publishing emerged and grew, CRKN achieved great success in lowering costs and increasing access to research literature for Canadian institutions, but its future during the next evolutionary phase of scholarly publication appears less certain. As mentioned previously, the Expert Panel (EP) was concerned about a number of organizational stresses, such as high staff turnover, most of which could be traced to its level of funding from member fees, which is inadequate for current operations.

Following up on this concern, the EP asked about risk-management processes in CRKN, noting that its Finance and Audit Committee had identified the importance of a risk-mitigation plan in 2009. The response focused on management of financial risks, and the EP was entirely satisfied with CRKN’s day-to-day financial management and accounting practices, as built in to its multi-year financial model. However, the risk-management framework related to matters of reputation, operational effectiveness, business continuity and obsolescence was still a work-in-progress, another victim of inadequate staff time to devote to anything other than the day-to-day business.

One of the emerging challenges for CRKN is the transition from subscription-based journals, where access is restricted to those at subscribing institutions, to “open access” journals, where content is freely available to anyone with an internet connection and publishers obtain their revenue from article processing charges (APCs) and/or institutional and funding organization subsidies. This disruptive change in scholarly publication models was described by one EP member as “a transformation as significant as the move from paper to electronic content” and was discussed at some length. It was pointed out that this involved a shift in payer from the institutions to the granting agencies, whose funds paid for most APCs. The granting agencies should also be involved at an early stage in discussing how to manage this transition. CRKN is clearly aware of the many issues swirling around open access, but it is not so clear that it has the resources to maintain its current subscription licence negotiations while also conducting new negotiations to obtain similarly favourable terms for APCs for authors from member institutions.

The EP questioned the resilience of CRKN, as currently resourced, to deal with the many challenges, such as open access, it will encounter as the nature, format and medium of scholarly communication change rapidly, along with the ways in which this content is used by the research community. Given the impact of these exciting but disruptive developments on the performance of the research and innovation system, CRKN needs to benefit more from the vision and foresight of the end-users of research knowledge and to be supported accordingly by its member universities. Clearly, CRKN is aware of the changes in the business models being adopted by publishers and the specific issues they pose. It pointed out, for example, that the American Chemical Society has adopted a pricing approach based on usage that contravenes the licensing principles of CRKN.

The challenge for CRKN is how to support these new models in a way that continues to provide exceptional value for its members while maintaining its regular licence negotiations. The Board and members of CRKN have to resolve fundamental questions about its future. Does it remain entirely focused on the negotiation of licences, a vital but limiting function of a contemporary research knowledge network? Or will CRKN embrace innovation and continue to play a leading role in enabling Canadian universities to take full advantage of the profound changes in the way research knowledge is acquired and used?

## 5. Conclusion

*“Ten years ago, we were looking only at content. Now we should be looking at new forms of content and scholarly communication: open access, open collaboration. In this new world, CRKN needs the capacity to innovate.” — Joyce Garnett, university librarian, Western University, VITaL Task Group chair.*

Based on the report provided by CRKN and presentations from supportive CRKN members, Board members and staff, the Expert Panel (EP) was convinced that CRKN is a well-run organization that has delivered exceptional returns for its members year after year and will continue to do so. The returns have come in the form of foregone costs for its members and, for the research community, increased and easier access to a wider range of research literature at universities and their affiliates in all regions.

The EP was equally certain that CRKN understands the challenges presented by emerging technologies and new forms of digital scholarship and has the planning and strategic capability to respond, though currently lacking the capacity to do so. Its sustainability is threatened by inadequate support from stakeholders, particularly its membership. This is impeding CRKN from innovating and attempting the necessary ventures, with their associated risks, that will allow Canadian universities to reap the full benefits of the revolution in research publication and the ways it can be used to advance new forms of scholarship.

The original support of the CFI and its funding partners was essential, timely and catalytic, stimulating the universities and the existing regional consortia to co-operate in building a national platform with the widest scope and reach. The EP also commended the CFI for extending its Outcome Measurement Study methodology into the area of platform evaluation. National platforms like CRKN have such a pervasive influence on the performance of Canada’s research and innovation system that they must be subject to periodic formative review to help them continue to be well run and to deliver the maximum benefits.

## Summary of ratings

<b>Operation of CRKN</b>	
EP rating of the effectiveness of planning and performance monitoring in platform planning	High
EP rating of the impact of the platform's planning process on the evolution of the platform and its user community since the base year	High
EP rating of the extent and suitability of stakeholder involvement with the platform	Medium
EP rating of the adequacy of the platform enhancements since the base year in comparison with the initial capital investment (to keep platform offerings up to date)	High
EP rating of the platform capabilities	State of the art
EP rating of the capacity and quality of platform personnel	Medium
EP rating of the overall approaches to sustainability of the platform and its related services	Medium
EP rating of the overall competitiveness of the platform in the international context based on its leadership, reputation and other relevant benchmarks	International level
EP rating of the impact of the convening and planning activities of the platform	Medium
EP rating of the extent to which the platform has established and fostered collaborative relationships	High
<b>Impacts of CRKN</b>	
EP rating of the benefits of foregone costs to the academic research community and funders	High
EP rating of the suitability of the platform's access policies and procedures	High
EP rating of the evolution in the size and distribution of the platform's potential user community	High
EP rating of the extent to which the user community supported by the platform is geographically distributed	High
EP rating of the extent of utilization of the platform and its services in relation to its capacity and performance targets	High
EP rating of the platform's impact on the quantity and the quality of research enabled	High
EP rating of the impact of the platform on increasing or sustaining the training of HQP since the base year	High
EP rating of the impact of the platform on quality of training (e.g. through access to state-of-the-art facilities, data that would not otherwise be available and interactions with peers and users from other institutions)	High
EP rating of the impact of the platform on activities and services at stakeholder institutions	High

EP rating of the impact of the platform on how research is done in the discipline(s)/field(s) it supports	High
EP rating of the impact of the platform on Canada's international visibility	Medium
EP rating of the amount of knowledge translation and transfer catalyzed by the platform	Medium
EP rating of the importance of socio-economic benefits catalyzed by the platform to Canada and Canadians	High
<b>Influence of the CFI and its funding partners</b>	
EP rating of the impact of the CFI in enabling acquisition and/or enhancement of the platform and the associated capabilities	High







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