

Seeing the Forest and the Trees: The Integrated Digital Scholarship Ecosystem (IDSE) Project of the Canadian Research Knowledge Network (CRKN)

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Introduction

“Knowledge infrastructures not only provide new maps to known territories—they reshape the geography itself.”¹

In 2014 the Canadian Research Knowledge Network (CRKN), a national higher education organization representing 75 universities, conducted an extensive study of digital scholarship in Canada. Through surveys, interviews, focus groups, literature reviews and other methods involving a wide variety of stakeholders, the project provided insights into the health of the ecosystem and the opportunities for academic libraries to strengthen and enhance it. This study is Phase 1 of the Integrated Digital Scholarship Ecosystem (IDSE) Project and is being used to chart future directions and to seek integrative and collaborative opportunities for CRKN and its members.

As digital scholarship evolves and advances, it is clear that the many and diverse participants in this ecosystem will have to work together in new and different ways. The challenges are many, but the opportunities are profound. The IDSE attempted to

understand the big picture (the forest) while still appreciating the specific elements (the trees). In doing so the IDSE tried to help the community see itself more clearly and to assist in charting new directions for CRKN, an organization that has had a significant role in transforming academic libraries and research in Canada.

A preliminary report was issued in March 2014. This was discussed by the CRKN Board and used as a means to receive feedback from the broader community. A final report of Phase 1 was presented to the Board in June 2014 with a Board response issued in September.^{2,3}

Overview

The Integrated Digital Scholarship Ecosystem (IDSE) is an initiative to advance research in Canada by understanding the complexity of the digital landscape and by seeking opportunities to align key stakeholders and providers around a series of shared objectives. The ecosystem combines capabilities and infrastructure beyond content to seamlessly harness the work of diverse organizations that contribute to digital scholarship.

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Specifically, the IDSE is:

- a **map** of the existing state of digital scholarship in Canada;
- a **lens** through which to foster collaboration and coordination;
- a **platform** to implement and sustain key services, programs, or projects;
- a **results oriented initiative** that serves faculty, students, and staff at research institutions as well as supporting inquiry-based research by all Canadians;
- an **ongoing and evolving process** that must be flexible and agile in order to respond to the changing nature of the digital environment and scholarly directions.

About the Canadian Research Knowledge Network (CRKN)

CRKN is a partnership of universities dedicated to expanding digital content for the university research enterprise in Canada. From its inception as a pilot project in 2000, CRKN has played a key role in building knowledge infrastructure in Canada, providing equitable and cost-effective access to scholarly content for universities nationwide. Working with librarians, researchers, administrators, funders, and publishers, CRKN undertakes large scale content acquisition and licensing initiatives in order to build knowledge infrastructure and research capacity in Canada's universities.

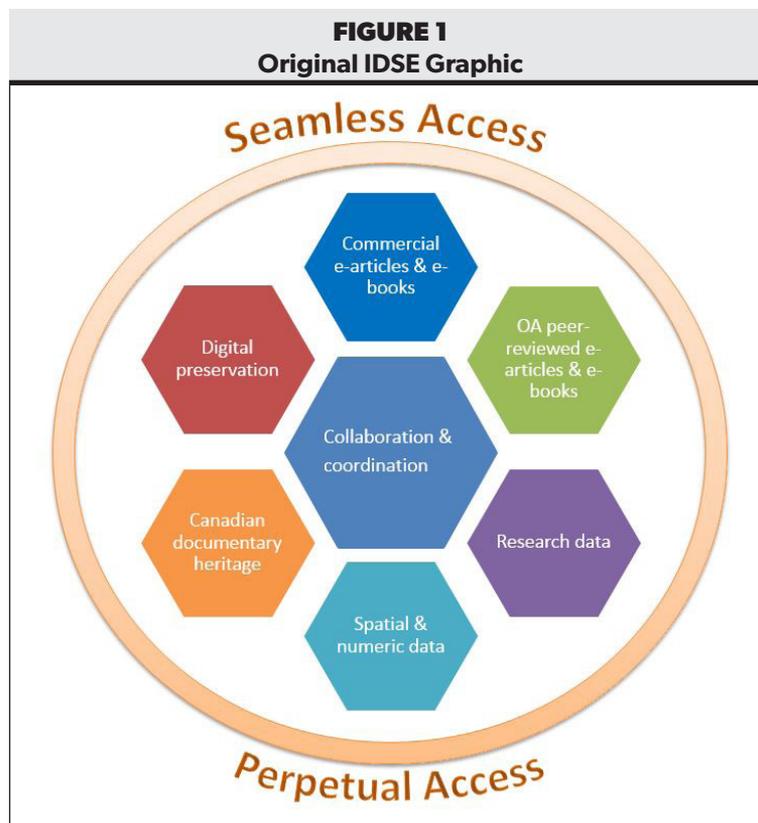
The impact of CRKN on Canadian libraries and research is substantial. Its 75 member institutions represent 1.2 million faculty and students across the country. With over 52 national content licenses, representing an expenditure of ~\$88M CAN annually, CRKN's consortial acquisition and licensing strategy results in overall savings of ~\$130M/year.

The 2013-2016 strategic plan for CRKN seeks to advance member capacity through a series of key themes.⁴ Deliberations on two of those themes by the CRKN Board of Directors ("Collaborate to Advance Scholarship" and "Expand Content and Service Offerings") lead to the creation of the IDSE initiative. IDSE was seen as a means to identify specific roles and responsibilities whereby CRKN could facilitate the advancement of digital scholarship in Canada.

Key IDSE Findings: A Visual Perspective

The two key graphics used in the project visualize the shift in how the project was originally conceived and how the findings reshaped our thinking.

The initial graphic used to explain the project and anticipate the results was focused on scholarly content and two overarching concepts: seamless access and perpetual access. The former acknowledged the importance of interconnectivity as well as content provision while the latter highlighted the need for sustainable access through contractual terms or digital



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preservation. Within the circle of the diagram were a series of content types or initiatives that were thought to be core to the concept of the IDSE.

At the center of the image, and of the project, is the emphasis on collaboration and coordination as a core value and enabler.

As the consultation process proceeded and as the IDSE findings were being better understood, it was clear that our conceptualization of the project needed adjustment. The graphic that emerged from this maintained the central focus on collaboration and coordination but it broadened its perspective to include new elements and new relationships. Perhaps unsurprisingly, the image became more complex.

Joining seamless access and perpetual access are two new elements that flesh out overarching priorities not represented in the initial diagram. While identifying “robust and sustainable” as a key component may seem obvious, it was clear that many in the community were concerned about the fragile nature of digital scholarship in Canada and that attention was needed

to secure its long term health. Similarly the original graphic undervalued the contextual importance of technology and how that technology was facilitated.

The addition of “leadership, expertise, technology” acknowledges the critical importance of advanced technologies at the core of digital scholarship but it does so by linking it to the expertise and leadership necessary to harness those technologies. Leadership, from all the stakeholders in the ecosystem, is essential to advance policies, programs, and funding to support the digital ecosystem. At the same time, developing and sustaining expertise in all aspects of digital scholarship is seen as critical.

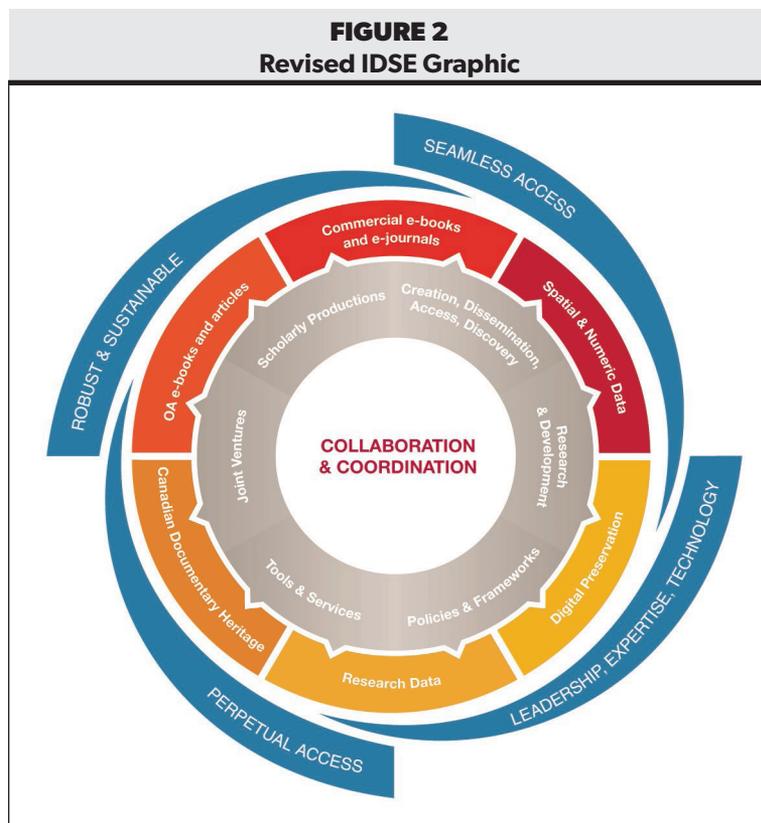
While the content focus survives in one of the rings of the diagram, a new ring was added that interoperates with the content elements. These six components (*Joint Ventures; Tools & Services; Policies & Frameworks; Research & Discovery, Creation, Dissemination, Access, Discovery; and Scholarly Productions*) broaden the implications of the IDSE by identifying strategic elements where new initiatives might be developed. This part of the diagram highlights the areas where CRKN could have a role in advancing and influencing the IDSE.

The new IDSE diagram is a more expansive representation of the key concepts and relationships in the digital scholarship ecosystem. It encapsulates not only the transition in our thinking but the new areas of focus emerging from the investigations.

The Observations from the IDSE

While the Canadian digital scholarship ecosystem is thriving in places, the general view held that it was “fragile.” However, the discussions with stakeholders did not focus on merely surviving in this evolving ecosystem but rather thriving and earning greater influence in global digital scholarship. Our investigations suggest that if the community as a whole was prepared to collaborate and take risks, the opportunity was there to dramatically enhance Canada’s

FIGURE 2
Revised IDSE Graphic



influence in research through digital scholarship. As a result the implications arising from the IDSE impact many of the key stakeholders.

Roles and Mandates

The evolving nature of the IDSE means that the roles of the participants are changing as well. This is evidenced by changing organizational mandates, new responsibilities, increased collaboration but also clear differentiation. These transformations will likely result in some tension as new alignments are determined and as traditional roles are challenged.

While we acknowledge the changing or emerging role of academic libraries in the ecosystem, it is also important to recognize that the roles of others in that same ecosystem are changing as well. This is not a matrix we slot into, it is a river we flow in. The blending and swirling are part of the key processes. Other stakeholders are also taking on new forms, exploring new places, and bringing forward different, non-traditional, contributions. It is one thing to emphasize what academic libraries can do, it is another for us to understand that others are in a similar position. Will those emergent new roles (mandates?) collide or comingle?

Perception and Changed Reality: Role of the Academic Library

The library's place in the pre-digital scholarship ecosystem was clear: it was the steward of the scholarly output. That role was important and acknowledged but it was largely confined to a limited piece of the overall picture. Digital advances have changed that but these changes have not always been acknowledged in the minds of many of partners in the IDSE. For some, the library is now the digital warehouse and little beyond. For example, in the Ithaca S+R Faculty Survey 2012, the role of the library was largely viewed as a "procurement agency" for the required resources.⁵ For others, however, the academic library has become the key platform for their work and an intimate partner in their processes. That the academic library is evolving and changing is not news to the library community but it is not fully understood by other

stakeholders within the ecosystem. The academic library community has the opportunity to play a very significant leadership role in the emergent ecosystem if it portrays and positions itself as able to contribute (able to partner) by bringing new resources, expertise, facilities, and innovative thinking to the table. For some in the ecosystem this will require convincing ("show me"), for others it will be welcomed ("partner with me"), and for yet others it will be an acknowledgement of the new status quo ("you are us").

Beyond Content: Digital Tools

While the acquisition and availability of more digital content by academic libraries was a common request from nearly all the stakeholders interviewed, researchers repeatedly requested digital tools and services as well. For many, digital content without the requisite digital tools made their work impossible. What tools? Who should purchase them and support them? If new tools were required, who would build them (and with whose resources)? Academic libraries typically partner with research groups or central IT units to enable access to appropriate digital tool sets. Increasingly the growing demand for diverse tools and the general lack of ability of central IT to maintain specialized tools has resulted in academic libraries becoming tool providers in an unprecedented way.

Repeatedly we heard that the focus should not be on large scale, fully integrated monolithic solutions. Information technology projects, and for the most part research projects, of this size are difficult to assemble and often unsuccessful or unsustainable. Instead the focus should be on a set of interrelated building blocks or a toolkit containing a variety of special purpose tools. John Unsworth called these elements or components "scholarly primitives".⁶ They are the core pieces that aggregate together to form an interlinked, interoperable network of networks. They address specific needs or solutions. A variety of tools might address one or many of the primitives Unsworth suggested in his initial draft list: Discovering, Annotating, Comparing, Referring, Sampling, Illustrating, and Representing.

Digital Orphans and the Challenge of Digital Preservation

Academic libraries have long been stewards of scholarly materials, especially the books and journals which have traditionally formed the basis of the academic record. New means of scholarly production have resulted in outcomes that don't resemble normal collections and often fall outside typical stewardship plans. These would include, for example, websites, digital tools, research data, and simulation environments. Many of these have become "digital orphans" that are not receiving the stewardship attention typical of traditional scholarly productions.

As a result, tragedies have happened. *Swift Current* was founded in 1984 by Frank Davey and Fred Wah as Canada's (some say the world's) first scholarly e-journal. After it ceased the journal was archived to tape. That tape was eventually overwritten resulting in the complete loss of this ground breaking publication. The role (and the requisite expertise) of academic libraries to successfully undertake these digital stewardship responsibilities remain both an interest and a concern. Initiatives like LOCKSS and HathiTrust are advancing digital preservation by identifying materials, coordinating stewardship responsibilities and accountabilities, implementing the necessary tools and services, and providing the appropriate training and expertise. In early discussions about IDSE, digital preservation was often one of the most prominent concerns. Digital orphans and digital scholarship at risk are the preoccupations of many. Focusing on coordinated and effective solutions will equally be the responsibility of many.

Promotion and Tenure

Despite the excitement around digital scholarship there remains a continuing concern that promotion and tenure (P&T) processes do not adequately reward the value and importance of this type of scholarly work. Traditional measures (high impact factor journals for example or the primacy of print monographs) still dominate. The undervaluing by P&T committees of such scholarly production as open access articles,

software creation, online environments, games, simulations, and data collection inhibits the innovative exploration of digital scholarship by pre-tenure faculty in particular.

Of course, the paradox here is that it is largely scholars themselves who create and sustain the very restricted or limited P&T criteria that are barriers to more widespread adoption. The idea of reforming P&T is viewed as difficult, even pointless, by many Deans and Provosts we interviewed. Whether it is older faculty, "non-digital" faculty or disciplinary standards trumping local academic units, unless P&T processes adequately and fairly recognize digital scholarship, barriers to innovation, adoption, and use will remain.

Research and Development: Developing a Research Agenda

Perhaps the most common observation about the IDSE was that it was still in a period of rapid and profound change. There are many fundamental questions yet to be addressed and none more so than those affecting academic libraries. It was suggested that academic libraries are too focused on the "low hanging fruit" as they consider those fundamental questions. These easy issues or "quick wins" are prioritized because they have immediate results. However, the emphasis on these means that there is little or no time focused on the more difficult and substantial challenges.

Despite efforts in the past by the Canadian Association of Research Libraries (CARL), academic libraries haven't articulated a core research agenda that arises from the emergence of the digital ecosystem and as a result they have not assembled the research capacity to address these issues. Unlike most professions, disciplines or areas of inquiry, academic libraries lack a common understanding of the key research problems facing the field. This is especially true regarding the digital ecosystem where the issues are complex and the expertise is limited. A research agenda for academic libraries in the digital ecosystem is essential if we are to proactively address fundamental challenges. To not engage in this puts libraries in the

position of adopting less than optimal solutions from other fields or being limited to solutions developed based on market potential.

Coordinating and Sustaining the Voice of the Community: Advocacy

A key challenge is influencing national policy frameworks in such a way that promotes and sustains digital scholarship. In Canada this means engaging with the federal government, key funding agencies, infrastructure providers, and regulatory agencies.

A particularly active and influential group in promoting significant ecosystem change is the Leadership Council for Digital Infrastructure (LCDI). The CRKN Executive Director sits on the LCDI creating an important link between that initiative and the strategic directions of CRKN. LCDI is a “big tent” under which many of the key stakeholders in the scholarly communications and research enterprise community have come together to advance a national DI advocacy program.⁷ DI is defined as more than just the wires and the servers; it includes expertise, facilities, training, and content.

The foci of LCDI and IDSE are not the same but they are tightly connected. They intersect at many points and we are mutually supportive of each other. The challenges will be to maintain alignment with LCDI as it advances its agenda within government and among the stakeholders. In many ways, LCDI and IDSE simply use different lenses to view the same challenges and opportunities.

The success of the LCDI remains to be seen. However, the relationship building across stakeholders facilitated by the LCDI has been important, resulting in the articulation of a common strategy. Fundamentally the IDSE will rely on the success of LCDI and similar groups to advance an effective advocacy program.

Next Steps

One of CRKN’s strengths is its ability to develop and maintain relationships. Successful collaborative initiatives usually begin as small projects that establish trust and common ground before they are successful-

ly scaled up. Investment in relationship building and the advancement of strategic projects with key organizations within the ecosystem are key priorities for CRKN and members endorsed the continued work in the IDSE at its annual meeting October 2014.

CRKN will pursue a number of strategic actions and projects, often in partnership with others, to enable member organizations to transition more effectively to a digital environment. A Special Projects Officer is being hired to drive the ongoing development of initiatives and to prepare funding proposals where appropriate. Initiatives recommended through Phase 1 include:

- facilitating new business models for open access;
- promoting awareness of open access publishing;
- creating a “mega-journal” for Canadian scholarly publishing;
- broadening and deepening access to scholarly content;
- seeking and advocating for digital preservation solutions;
- supporting the linking/discovery of Canadian data/content repositories;
- extending the availability of digital tools;
- fostering member engagement in the development of new digital tools;
- advancing the inclusion/integration of the library into university and scholarly publishing governance; and
- advocating for evolution of promotion and tenure criteria to reflect changes in the research dissemination environment.

Conclusion

With the IDSE we are building not a solution but rather identifying and nurturing an ecosystem. This project has uncovered, within Canadian digital scholarship, areas that need attention and opportunities that have not been addressed or fully realized. The gaps and opportunities outlined here are presented through the lens and role of the academic library but

they should be tightly interconnected with the larger digital ecosystem recognizing the holistic nature of the work done by all the stakeholders.

The Canadian Research Knowledge Network is uniquely positioned to make a difference as this ecosystem evolves. Academic libraries are central to digital scholarship and are taking on even larger roles as new technologies, processes, and partnerships emerge. In times of financial restraint, innovative partnerships and collaborative funding (central characteristics of CRKN) are key tools to maximize resources and achieve common objectives.

The IDSE is enabling the next generation of academic library collaboration to further seamless access, diversity of content, and linked infrastructures. CRKN and its members are encouraged to provide the requisite leadership, nurture the critical partners, and to take the risks necessary to advance scholarship in Canada.

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Notes

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