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Abstract

The Canadian Research Knowledge Network (CRKN) is a consortia of Canadian university libraries dedicated to expanding digital content for the academic research enterprise in Canada. Two themes in the CRKN strategic plan are to 1) collaborate to advance scholarship, and 2) engage members and stakeholders. The Integrated Digital Scholarship Ecosystem (IDSE) project addresses these themes by mapping activities in the Canadian digital scholarship landscape, with a view to understanding the complexity of the landscape, and identifying opportunities to align key stakeholders and providers around a series of shared objectives. This article describes the IDSE project, and how the mapping exercise will provide a lens through which to identify opportunities for stakeholders to coordinate efforts and collaborate on tools, services, programs, and projects.

Keywords: Academic libraries; Collaboration; Coordination; Digital scholarship ecosystem

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Introduction

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 stakeholders around a series of shared objectives. Specifically, the IDSE project will inventory and map the existing state of digital scholarship in Canada, and be used as a lens through which stakeholders will foster collaboration and coordination, and implement and sustain key services, programs, and projects. The goal of the IDSE project is to serve faculty, students, and staff at research institutions by maximizing stakeholder value and contributions, and reducing threats such as duplication, overlap, unclear policy, insufficient funding, inadequate expertise, and diffuse focus, which reduce Canada's impact in the global digital scholarship arena.

CRKN background

The Canadian Research Knowledge Network (CRKN) is a partnership of Canadian universities dedicated to expanding digital content for the academic research enterprise in Canada. Through the coordinated leadership of librarians, researchers, administrators, and other stakeholders in the research community, the CRKN undertakes large-scale content acquisition and licensing initiatives in order to build knowledge infrastructure and research and teaching capacity in Canada's universities. The IDSE project is consistent with the CRKN's mandate by identifying the wide range of projects, programs, and services across the Canadian academic environment, along with the significant and broad range of expertise that supports these activities.

Conceptualizing the Integrated Digital Scholarship Ecosystem (IDSE)

The concept of the Integrated Digital Scholarship Ecosystem (IDSE) arose out of the CRKN's 2013–2016 strategic planning process, where the objective to “collaborate to advance digital scholarship” (Canadian Research Knowledge Network, 2013) was first proposed. At the 2013 annual general meeting of the CRKN, members endorsed a proposal to develop an Integrated Digital Scholarship Ecosystem (IDSE) by coordinating and complementing a number of existing and emerging Canadian initiatives.

At its inception, the IDSE project had the following objectives:

- To advance research capacity and innovation in Canada;
- To create an integrated digital scholarship ecosystem by coordinating and complementing a number of existing and emerging Canadian initiatives; and
- To build on demonstrated success in leveraging investment to the Canadian academic community with an agile organizational structure and outside funding.

During 2014, extensive research and consultations were conducted to examine the ecosystem and to contextualize these objectives. A preliminary report in March (Ridley & Pagotto, 2014a) and a final report in July (Ridley & Pagotto, 2014b) identified issues and made observations detailing the CRKN's opportunities to make a difference in the ecosystem, given that academic libraries are central to digital scholarship and are taking on even larger roles as new technologies, processes, and partnerships emerge. In September 2014, the CRKN Board of Directors responded with “Putting the ‘I’ into

IDSE: Roadmap Towards the Vision of the Integrated Digital Scholarship Ecosystem” (CRKN Board of Directors, 2014), which provided the following core recommendations and specific tactics:

- Prepare a roadmap based on the Board’s vision and member priorities as expressed.
 - TACTIC: Strengthen current and develop new stakeholder relationships.
 - TACTIC: The CRKN will provide a forum for ongoing exchange with and among members.
- Pursue key opportunities in the areas of open access, digital content, digital stewardship, digital tools, and digital leadership.

With the hiring of a project manager in April 2015, implementation of the IDSE roadmap and associated opportunities was begun.

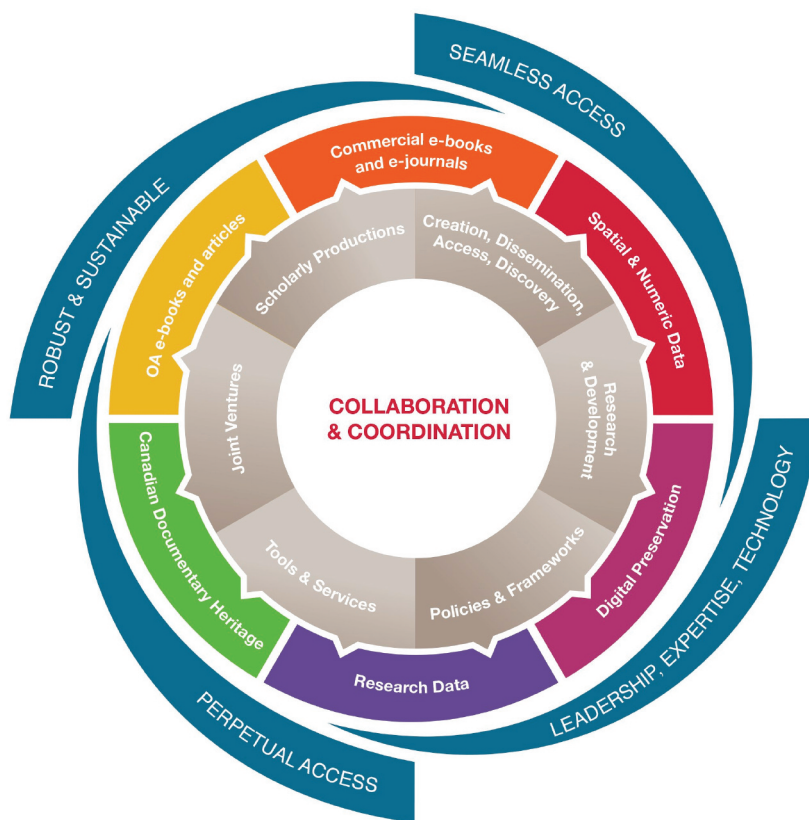
Understanding IDSE: The IDSE flywheel

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.

The IDSE flywheel (see Figure 1) is a graphical representation of the ecosystem.

Existing initiatives can be identified across six categories: commercial e-books and e-journals; spatial and numerical data; digital preservation; research data management; Canadian documentary heritage; and open access e-books and e-journals. Each initiative can also be associated across six attributes: scholarly production; creation, dissemination, access, and discovery; research and development; policies and frameworks; tools and services; and joint ventures. All initiatives comply with four foundational assumptions: robust and sustainable, seamless access, perpetual access and leadership, expertise and technology. Finally, collaboration and coordination are at the centre, and are the hub of the ecosystem.

Figure 1: The IDSE Flywheel



Identifying and building on community strength

The Canadian Research Knowledge Network (CRKN) is a consortia of academic libraries in 75 universities across

Canada. Our voting members are the university librarians for each institution, and the CRKN’s many committees and task groups are led by librarians knowledgeable in all areas of academic research, and who collaborate daily with faculty, students, researchers, and senior administrators. Today’s academic library is no longer simply a digital warehouse or procurement service; CRKN librarians possess deep expertise across a broad range of areas, including scholarly communications, copyright, open access, collection development and preservation, and research data management. Academic librarians are uniquely positioned to advance research in Canada by identifying common goals and working together to develop and deliver services and programs to support and strengthen Canadian academic research activities.

IDSE in context: Scanning and mapping the digital scholarship ecosystem

Canada is a large country with a small population, and, in comparison to other global regions, a relatively small number of universities. Canadian academic institutions are publicly funded, which is why collaboration is so critical; public dollars go further and achieve more when the community works together and coordinates to reduce duplication and overlap, and increase impact. Due to how geographically dispersed Canadian institutions are, it’s challenging for the CRKN community to be aware of all the digital scholarship activities in progress across the 75 institutions. To address this challenge, the CRKN’s IDSE project is building an inventory of digital scholarship activities across Canada, and mapping these activities to six categories and associated types of outputs (see Table 1).

Table 1: Organizational Structure for Digital Scholarship Activities and Outputs

Categories	Output Type
Commercial E-books and E-journals Spatial & Numeric Data Digital Preservation Research Data Management Canadian Documentary Heritage OA E-books and E-journals	Scholarly Productions Creation, Dissemination, Access, & Discovery Research & Development Policies & Frameworks Tools & Services Joint Ventures

The first step required to build an inventory is to conduct an environmental scan to identify activities in the ecosystem. For the IDSE project, the environmental scan process involved building on the considerable catalogue of initiatives that had been identified during the research and consultation phase in 2014. In 2015 and 2016, the environmental scan continued with a goal to discover as many initiatives as possible, acknowledging that capturing all activities is difficult, and maintaining the inventory is an evolving and ongoing process.

During the summer of 2016, the catalogue is being converted to a relational database that will be accessible via a public-facing website offering a searchable, sortable index of digital scholarship initiatives in universities and related organizations across Canada. This website, known as the IDSE Map, will identify how stakeholders currently interact, where new opportunities for coordination and collaboration can be realized, and where duplication of effort can be reduced. The IDSE Map is a tool to identify the

connections and relationships among these initiatives and the people and organizations that make them happen.

IDSE in action: CRKN initiatives on the IDSE Map

The Canadian Research Knowledge Network (CRKN) undertakes a number of member-driven initiatives that contribute to the digital scholarship ecosystem. Identifying CRKN initiatives on the IDSE Map helps to understand the relationship among the groups participating in these initiatives, and helps to discover areas of expertise, ways to reduce overlap, and identify opportunities for CRKN members to work together.

It is important to note that while this article focuses on CRKN initiatives, CRKN is only one organization of many that are included on the IDSE Map. Organizations include professional associations, industry groups, funding agencies, publishers, scholarly associations, regional consortia, stakeholder groups, and many others. The CRKN initiatives described below (see Table 2) are selected examples of activities in the IDSE Map.

Table 2: Selected examples of activities in the IDSE Map

Name	CRKN Model License
Category	Commercial E-books & E-journals
Output Type	Tools & Services; Policies & Frameworks
Related Organizations	Publishers; Vendors
Description	The CRKN plays a key role as a consortial buyer of scholarly content on behalf of CRKN member institutions, providing access to electronic versions of scholarly journals and research databases to 1.2 million university researchers and students across Canada. The CRKN has been recognized in Canada and abroad for its innovative procurement process and model license, used to negotiate licenses for digital content in science, technology, and medical (STM) and social sciences and humanities (SSH) with the major publishers, as well as a number of smaller, domain-specific publishers.

Name	Foreign Exchange Project
Category	Commercial E-books & E-journals
Output Type	Tools & Services; Policies & Frameworks
Related Organizations	Publishers; Vendors
Description	The bulk of content that is licensed by the CRKN is billed in U.S. currency, which is beneficial in avoiding potential exchange surcharges from vendors and providing better negotiation leverage. However, this does expose members to significant foreign exchange risk. Through the Foreign Exchange Project, the CRKN offers members the opportunity to secure better rates for their invoicing in U.S. dollars.

Table 2 (cont.)

Name	Institutional Mobilization Toolkit
Category	Commercial E-books & E-journals
Output Type	Research & Development; Tools & Services
Related Organizations	Canadian Academic Libraries; Executive Heads at Canadian Universities
Description	Access to scholarly research is key to Canada's success in the global information economy; the current commercial publishing model is placing that access at risk. To address these issues, the CRKN and the Institutional Mobilization Task Group (IMTG) have developed the Institutional Mobilization Toolkit (CRKN, 2013). It is a series of documents that clarifies the issues in scholarly communication to help librarians communicate with researchers, faculty members, and administrators about how their publishing choices, and promotions and tenure decisions, impact the larger academic enterprise.

Name	Journal Usage Project
Category	Commercial E-books & E-journals
Output Type	Research & Development
Related Organizations	Canadian University Libraries; Publishers
Description	The Journal Usage Project extends research initially conducted by Dr. Vincent Larivière with four universities in Québec that examined the impact on libraries of the consolidation of journal publishing and the development of what is known in the industry as the "Big Deal." The extension of the research on a national scale will offer individual institutions an insight into journal usage and citations by faculty at their own institutions as compared with their faculty perceptions of journal value, and it affords the opportunity for some analysis of the data across the membership. Also, on a national scale, this research will explore whether there are similarities, differences, or trends in usage, citation, faculty perceptions, or other factors among various types of institutions in Canada; for example, discovering differences in teaching versus research institutions, French versus English institutions, regional differences, and so on.

Name	Érudit
Category	Open Access E-books & E-journals
Output Type	Tools & Services; Dissemination, Access & Discovery; Partnerships
Related Organizations	Independent Journals; Scholarly Journals
Description	Érudit was established in 1998 to support the dissemination of North American French-language research outputs in the social sciences and humanities. In 2008, rather than looking at a traditional subscription renewal, the CRKN entered into a partnership model with the Érudit Consortium, which involves support for a transition to open access and involvement in the Érudit consortium governance. This partnership demonstrates to the broader Canadian academic publishing community how a viable model where libraries and publishers work together can transform the nature of scholarly publishing in a sustainable way for all.

Table 2 (cont.)

Name	SCOAP ₃
Category	Open Access E-books & E-journals
Output Type	Partnerships; Dissemination, Access, Discovery
Related Organizations	International Consortia; International Funding Agencies; International Libraries; Publishers
Description	The CRKN is the national contact point for SCOAP ₃ , a partnership of over three thousand libraries, funding agencies, and research centres in 47 countries and three intergovernmental organizations. In collaboration with publishers, “SCOAP ₃ has converted key journals in the field of High-Energy Physics to Open Access with no cost for authors. SCOAP ₃ centrally pays publishers for costs involved in providing Open Access, publishers in turn reduce subscription fees to all their customers, who can re-direct these funds to contribute to SCOAP ₃ . Each country contributes in a way commensurate to its scientific output in the field. In addition, existing Open Access journals are also centrally supported, removing any existing financial barrier for authors” (SCOAP ₃ , 2016).

Name	Canadian National Digital Heritage Index
Category	Canadian Documentary Heritage
Output Type	Tools & Services; Dissemination, Access & Discovery
Related Organizations	Canadian University Archives and Special Collections; Provincial Libraries; Territorial Libraries
Description	<p>While new scholarly content is critical to the advancement of scholarship, it is equally important for many disciplines that Canadian heritage materials are also available in digital formats. Library and Archives Canada (LAC) has developed the Documentary Heritage Communities Program (DHCP) to “ensure that Canada’s continuing memory is documented and accessible to current and future generations by adopting a more collaborative approach with local documentary heritage communities” (Library and Archives Canada, 2015).</p> <p>The CRKN received funding from the DHCP in late 2015, and in March 2016 launched the Canadian National Digital Heritage Index (CNDHI) (CRKN, 2016). The CNDHI is an index of digitized Canadian heritage collections located at Canadian universities and provincial and territorial libraries. Affectionately pronounced “candy,” CNDHI is supported by funding from Library and Archives Canada. CNDHI is designed to increase awareness of and access to digital heritage collections in Canada to support the academic research enterprise and to facilitate information sharing within the Canadian documentary heritage community.</p>

Future directions

The digital scholarship ecosystem continues to evolve at a rapid rate, and there is an opportunity for academic libraries and librarians to take on an expanded role in the ecosystem. Academic libraries are central to digital scholarship and are taking on even larger roles as new technologies, processes, and partnerships emerge. The IDSE Map is a tool to understand the Canadian ecosystem and to identify opportunities to

collaborate, reduce duplication, raise the visibility of expertise in the community, and increase the level of impact in the ecosystem. Increasingly, geography and political borders are no longer limits to collaboration, and even greater impacts can be realized when countries and regions work together toward a common goal. The IDSE Map may evolve to reflect these developments at a global scale.

Conclusion

Through the creation of the IDSE Map, stakeholders who advance and support Canadian research will have a much-needed overview of all the “moving parts” in the ecosystem. By identifying the resulting gaps, challenges, and opportunities, the CRKN can advance initiatives that strengthen the landscape and present shared solutions for common problems. By understanding the IDSE, CRKN will be best able to lead or support in a manner that strengthens Canadian research and furthers the objectives of its members.

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