

Research Data Management: Potential Roles for Scholars Portal

White Paper prepared for OCUL Directors by Scholars Portal in Consultation with OCUL-SP
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Introduction

We are the midst of a major change in the nature of scholarly communication, and one driver of this change is the pervasiveness of digital data and its increasing importance to scholarly research. As the quantity and complexity of data required for and produced by scholarly research continues to grow, it becomes ever more difficult to manage. This has led to a number of trends in the research community:

- A drive towards data publication and sharing to improve (among other things) research reproducibility. In more and more cases, data sharing is being mandated either by journal publishers or by funding agencies. This has led to a profusion of data repositories, data identifier systems, and data citation format recommendations.
- A demand for greater recognition of the central role data creation and management occupies in the research process. Increasingly, researchers think of their datasets as a research product in themselves, for which they should receive credit. The idea of tracking the impact of datasets is now often discussed as part of the burgeoning field of altmetrics. Many data repository systems are [incorporating ORCID identifiers](#)¹ in addition to DOIs in order to facilitate this sort of impact analysis.
- Big data mining and analysis requires skills not just in statistical analysis but also in computer science, leading to the emergence of the [data scientist as a key player in academic research](#).² Data management is a challenge that consumes an ever-larger chunk of researchers' time, and there is demand for support services that can assist with these activities.

There are several reasons why academic libraries are well positioned to play a role in this new landscape:

- Academic libraries have long-established skills in information and data management
- Academic libraries have an established role in the long-term stewardship of the scholarly output of their institutions (e.g. through institutional repositories)
- Academic libraries' core values include support for open access to information whenever possible

In Ontario, OCUL and Scholars Portal are important resources that can support member institutions in the introduction of new services. Over the last decade, Scholars Portal has worked with OCUL libraries to build infrastructure to support the digital preservation of shared

¹ <https://orcid.org/blog/2013/06/17/connecting-research-datasets-and-researchers>

² <http://www.washington.edu/news/2015/02/13/aaas-symposium-looks-at-how-to-bring-big-data-skills-to-academia/>

collections of textual and numeric data. This has resulted in large, central aggregations of scholarly articles and monographs as well as statistical and geospatial data as represented in tools such as SP Journals, SB Books, <odesi>, and the Scholars GeoPortal. More recently, Scholars Portal has begun to explore ways to extend that shared infrastructure in order to support the local preservation programs of member OCUL libraries. Projects such as the Ontario Library Research Cloud (OLRC), integration of common archiving tools such as Archivematica with the OLRC, and proposals for a new service called Permafrost, which would layer digital preservation services onto the OLRC -- all of these are examples of current efforts at Scholars Portal to build capacity for digital preservation at individual OCUL libraries by leveraging investments in shared infrastructure.

Research data management, including long-term preservation and curation, is another area where Scholars Portal could play a useful supporting role for OCUL member libraries. The nature and extent of that role would vary from institution to institution, reflecting different local capacities, local priorities, and local partnerships with campus IT and research support offices. It would also need to be framed in light of emerging national initiatives in RDM, including CARL's Portage Project, and other initiatives that might be spearheaded by stakeholder groups.

What unique value can Scholars Portal bring to OCUL institutions developing research data management services? What value can Scholars Portal and OCUL bring to national projects, and which of these projects should we engage with? How should Scholars Portal participation in national RDM initiatives be directed? What role should OCUL-SP and the OCUL Digital Curation Community play in setting directions for Scholars Portal in this area? What kinds of services could Scholars Portal provide, how much would these services cost, and how should they be funded? What measures of success can we establish for ourselves to ensure we are providing value in this area?

Answers to these questions will provide Scholars Portal with clearer direction in pursuing RDM related projects. Scenarios for Scholars Portal partnership in RDM support with OCUL libraries and national projects like Portage are sketched out in this document. To highlight potential models for partnership, however, we start first with an environmental scan of research data management activities internationally, in Canada, and in OCUL.

Environmental scan

International initiatives

In a growing number of countries, federal research granting agencies have begun to require data management planning, and in some cases data sharing, of funding recipients. This has led to an exponential growth in demand for services, including:

- Support for the creation of Data Management Plans (DMPs) that meet the requirements of specific funding bodies
- Hosting of data repositories and/or support for the selection of and deposit into existing external data repositories
- Access to large amounts of long-term data storage

- Access to software tools, computing equipment, and physical spaces that support data-intensive research

Countries differ in terms of who is performing these services and how they are funded. In Europe, national services such as the [UK Data Archive](http://www.data-archive.ac.uk) and [Data Archiving and Networked Services \(DANS\)](http://www.dans.knaw.nl/nl) in the Netherlands, accept data deposits from researchers.³ All European Union data archives' holdings are aggregated in CESSDA's [data catalogue](http://www.cessda.net/CESSDA-Services/Resources/Data-Catalogue) to improve access.⁴ Australia achieves a similar kind of aggregation with its national [Australian Data Archive](http://www.ada.edu.au) and [Australian National Data Service \(ANDS\)](http://www.andcs.org.au).⁵ Additionally, organizations like JISC in the UK make government funds available to support the development of technologies and tools to advance research data management (an example is the JISC program known as [Research Data Spring](https://www.jisc.ac.uk/rd/projects/research-data-spring)).⁶

In the United States, federal granting agencies have mandated the creation of Data Management Plans and in many cases data deposit, but there is no national data archive. There are several national domain archives, however, including the ICPSR, the repositories affiliated with DATAOne, and the National Snow and Ice Data Center as examples. Researchers select from a range of repositories dedicated to specific disciplines, institutions, or publications. Consequently, a range of data repository/data sharing software solutions have emerged over the last few years, including [Figshare](http://www.figshare.com), [Dataverse](http://www.dataverse.org), [CKAN](http://www.ckan.org), [OSF](http://www.osf.io) (Open Science Framework), and [Dryad](http://www.dryad.org).

RDM in Academic Libraries

Around the world, universities have become engaged with research data management. Many are adopting institutional data management policies in line with those of funding agencies in their country. Some are creating institutional data repositories of their own. In some cases, the academic library is a partner. Academic libraries have already established a role in the preservation of research outputs through the creation of institutional repositories. Similarly, institutional data repositories are often based within the library (in some cases, publications and datasets are both housed in the existing institutional repository). Even in cases where the library or university does not offer its own repository, many libraries have developed support services around the workflow of managing, describing, and depositing data into existing repositories.⁷

Library-based consortial initiatives have emerged as well. The California Digital Library offers [EZID](http://www.ezid.org) (a system to register persistent identifiers, such as DOIs, for datasets) and [DMPTool](http://www.dmptool.org) (a

³ <http://www.data-archive.ac.uk> and <http://www.dans.knaw.nl/nl>

⁴ <http://www.cessda.net/CESSDA-Services/Resources/Data-Catalogue>

⁵ <https://www.ada.edu.au> and <http://www.andcs.org.au>

⁶ <https://www.jisc.ac.uk/rd/projects/research-data-spring>

⁷ For practices in several US universities, see David Minor, et al, "Research Data Curation Pilots: Lessons Learned" in *International Journal of Digital Curation* 2014: 9(1), 220-230 [DOI: 10.2218/ijdc.v9i1.313] and Katherine G. Akers et al, "Building Support for Research Data Management: Biographies of Eight Research Universities" in *International Journal of Digital Curation* 2014: 9(2), 171-191 [DOI: 10.2218/ijdc.v9i2.327]

tool for the creation of data management plans) to users across the US and beyond. The Association of Research Libraries developed the [SHARE](#) initiative, dedicated to collecting, connecting, and enhancing metadata that describes research activities and outputs. The first service offering of SHARE is a notification service providing alerts of research events including the publication of data. In the UK, JISC, through its *Research at Risk* project, is developing a pilot service for a shared platform for “ingesting, publishing, safely storing, archiving and preserving research data.”⁸

Research support services community efforts

Beyond the library community, international membership-based associations have formed to engage with the challenges presented by research data management, such as [CODATA](#) (Committee on Data for Science and Technology), [RDA](#) (Research Data Alliance), [CASRAI](#) (Consortia Advancing Standards in Research Administration Information), and [DataCite](#). These bring together researchers, administrators and funders, as well as academic librarians.

The broad RDM community recognizes a need for training and skills development for those working in research data management, whether within the library community or elsewhere. Initiatives such as [DataQ](#) and [DataStories](#) provide helpful practical examples of good and bad data management. The [Digital Curation Centre](#) in the UK is a hugely important resource for professionals around the world, providing training in the form of webinars, conferences ([IDCC](#)), and even a program for a [3 hour RDM training for librarians](#). (DCC also develops and hosts a data management planning tool called DMPOnline, similar to the DMPTool from UC3 of the California Digital Library). In the US, training curriculum developments include the [New England Collaborative Data Management Curriculum](#), a project led by the Lamar Soutter Library at the University of Massachusetts Medical School, and “post-Master’s” certificates in data curation offered by iSchools such as UNC’s School of Information and Library Science.

Canadian context

The past several years have seen significant activities in the RDM landscape Canada, in recognition of the need to fill significant gaps. A recent environmental scan conducted for the Canadian research funding agencies notes that, “Canada still lacks infrastructure, services and funding mechanisms to support widespread RDM. Infrastructure funding remains focused on domain-based solutions that support research excellence, rather than data sharing and preservation after the lifespan of the project.”⁹

In Canada, as in the United States, there is no national data archive. There were several unsuccessful attempts between the 1970s and 2000s to establish one, described in detail by Chuck Humphrey¹⁰ and now the strategy has shifted from creating a national institution to developing national infrastructure. Canada has a strong network of information professionals who undertake advocacy efforts under the umbrella of organizations such as the Canadian

⁸ <https://www.jisc.ac.uk/rd/projects/research-at-risk>

⁹ Shearer, K. <http://www.science.gc.ca/default.asp?lang=En&n=1E116DB8-1>

¹⁰ <http://preservingresearchdataincanada.net/category/introduction/>

Association for Public Data Use (CAPDU) and work to implement relevant projects and services through the Canadian Association of Research Libraries (CARL).

Research data management has been on the radar of the federal government since at least 2005, when the National Consultation on Access to Scientific Research Data (NCASRD) released its report calling for the establishment of a national steering body to coordinate data management and preservation. However, there was insufficient political will to put such a body into place, and the discussions shifted towards a distributed network model instead.

In 2010, CARL entered into discussions with key national organizations engaged in developing and supporting Canada's research computing infrastructure -- CANARIE, Compute Canada, and CUCCIO -- about the possibility of submitting a proposal for a CFI grant to fund a national RDM system. While some support for the proposal was generated, the CFI funding envelopes did not end up being designed for a national infrastructure project, and the proposal was not submitted.

In the wake of the NCASRD report, an informal group known as the Research Data Strategy Working Group was formed, which held a [Research Data Summit](#) in 2011, bringing together researchers and stakeholders from government, industry and universities. One of the results of this summit was the formation of [Research Data Canada \(RDC\)](#) in 2012, intended as "a forum in which multiple stakeholders come together to build research data stewardship in Canada". Research Data Canada has a number of committees and has also played a role in coordinating a number of [technical infrastructure pilot projects](#). RDC is now a program under the governance of CANARIE.

CARL and Portage

In 2013, the Canadian Association of Research Libraries (CARL), one of the early RDC stakeholders, began exploring ways to help facilitate the development of RDM services in libraries. An initial step was a course for librarians on RDM services. The thirst for collaboration shown by participants led to further planning. Knowing that RDM activities were growing in some regions of the country and not others, CARL invited regional library consortia to send representatives to a meeting in the Fall of 2013 to discuss what could be done together. The result was Project ARC, launched in the Spring of 2014.

During its one-year mandate, Project ARC demonstrated the possibilities for several aspects of a national research data management network, and in the spring of 2015 it transitioned to the Portage Network, with sponsorship from CARL. Portage is envisioned as a national RDM service to assist researchers and other RDM stakeholders through (1) a library-based network of expertise on RDM and (2) national platforms for planning, preserving, and discovering research data. The first service offered by Portage is the "DMP Assistant", a data management planning tool based on DMPOnline and now available in both French and English, launched in October 2015. Another service in development with Compute Canada is a national preservation pipeline for the ingest of research data and metadata, and its processing and transfer to archival replicated storage and to a data repository for access control and discovery purposes. A series

of expert working groups will guide the work of Portage in other areas, including preservation, access, and education and training.

Funding Agencies and the Policy Framework for RDM

Throughout all of these activities, the federal granting agencies have been holding consultations and making plans for the institution of data management requirements which currently vary from funding agency to funding agency. The Tri-Agencies (SSHRC, NSERC, and CIHR) introduced a harmonized [open access policy for publications](#) in February 2015, and in July 2015 they issued a [Draft Tri-Agency Statement of Principles on Digital Data Management](#).¹¹ Comments on the draft were received until September 2015. OCUL, along with several other groups in the country, supported the response submitted by CARL.

RDM Support in Canadian Academic Libraries

Across Canada, in anticipation of new Tri-Agency data management requirements, academic institutions are beginning to plan for the services researchers will need to ensure compliance and to implement infrastructure and best practices for research data preservation. Examples of academic libraries outside Ontario playing a leadership role include the [University of Alberta](#) and the [University of British Columbia](#). The University of Alberta has led the country in implementation of a DMP Planning tool, contributing work to the Portage DMP Assistant project. Meanwhile, the University of British Columbia library has produced many training resources for data management planning and has introduced a [research data management course](#) into its iSchool curriculum, the first of its kind in Canada.¹²

RDM Activities among Libraries in Ontario

Across the 21 academic libraries in Ontario, there are varying degrees of support in place to assist researchers with their research data management needs. The following survey is not meant to be comprehensive, but it does give a sense of the variety of practice in Ontario:

- University of Toronto Libraries have been actively accepting research data deposits in the Map and Data Library for many years. Faculty work closely with the Libraries IT unit to deposit and make their data available through platforms such as MyMedia and Collections U of T. UT Libraries is working closely with the Office of the Vice President of Research and Innovation, with central IT services, and with other senior administrators on RDM issues. The UTL RDM working group is developing plans for scalable RDM services and advising on the technical infrastructure that will support institutional needs. UT Libraries are in the process of hiring a full-time Research Data Management Librarian. Steve Marks, the Digital Preservation Librarian for UTL, is chairing the Portage Preservation Expert Group.
- Queen's University Library has been involved in data curation and management for many years, working closely with University Research Services, ITServices and researchers. They

¹¹ <http://www.science.gc.ca/default.asp?lang=En&n=F6765465-1> and <http://www.science.gc.ca/default.asp?lang=En&n=83F7624E-1>

¹² <http://slais.ubc.ca/libr559s/>

are the host of the Canadian Opinion Research Archive (CORA). Jeff Moon from Queen's is chairing the Portage DMP Expert Group and played a significant role in configuration of the Portage DMP Assistant tool.

- Carleton University Library has been involved in data curation and management for many years. CUL holds the data archive for a number of major research projects, such as the Canadian Millennium Scholarship Fund data. They are planning to roll out Dataverse as their research data repository in 2016.
- University of Guelph Library has been providing RDM services for about 5 years through the Research Enterprise & Scholarly Communication team.¹³ Carol Perry from Guelph represented OCUL on Project ARC and continues to represent OCUL in the Canadian Polar Data Network.
- York University Libraries have been providing RDM services for about 3 years. They work with researchers on creating data management plans for their grant applications, as well as facilitate deposit of research data in YorkSpace, the York University Digital Library, and the Dataverse instance hosted by Scholars Portal.
- McMaster: University Library has worked to engage various groups across campus to spread general knowledge of RDM and to better understand the needs of researchers. Library staff conducted an RDM workshop for 40 research faculty, staff and graduate students, focusing on data management planning, metadata, data sharing and version control. Planning is underway for another RDM workshop in early 2016. A few researchers now publish their data in Dataverse, and library staff are working with more researchers to archive and publish their data. The Library is registered with Datacite Canada to offer DOIs for archived data sets and studies within the mcmaster.ca <<http://mcmaster.ca>> and scholarsportal.info <<http://scholarsportal.info>> (dataverse) domains.
- At the University of Ottawa, the Library has a working group reviewing RDM support, such as instruction, services and infrastructure, needed for our researchers. The University has a draft data stewardship plan, jointly written by the VP Research Office and the Library, and the next step for this plan will involve a consultation among all stakeholder groups within the University. The librarians who are providing support for RDM are currently mostly directing researchers to infrastructure that exists outside of the university, such as disciplinary repositories found on www.re3data.org and to Dataverse at Scholars Portal. The practice is quite diverse and mostly follows disciplinary practices with respect to research data management. Talia Chung from Ottawa served on the Portage working group for DMP Assistant.
- University of Waterloo Library hosted a Data Management Conference and have produced some information guides around the presentations: The library is

¹³ <https://www.uoguelph.ca/cio/research-data-management>

pointing people to the great work being done by others and are also consulting on an ad-hoc basis. The library continues to make connections with the Office of Research (in preparation for the adoption of the Tri-Council Policy) and IST (Information Systems & Technology).

- Western Libraries has a Research Data Management Subcommittee and is beginning to offer RDM services to local constituents. They have established a Western Libraries Dataverse and are currently gathering resource requirements in the form of a series of questions to OCUL partners in order to gauge the support required for Dataverse. Western Libraries has a history of collecting data and archiving some researcher data.

OCUL and Scholars Portal RDM Initiatives

While there is no official RDM Community for OCUL, the Digital Curation Community has created a focus for discussion of RDM issues among member libraries.¹⁴ Their conversations, which encompass the full digital curation lifecycle, have included aspects of RDM as well as a special focus on issues around digital curation and preservation. Likewise, the OCUL Data and GIS Communities represent a unique group of experts in the management and use of datasets, with a strong focus on researcher requirements. An OCUL listserv with over 100 members provides an online forum for sharing expertise in RDM.

Scholars Portal provides a limited range of RDM support services for OCUL libraries, based principally around a local implementation of the Dataverse content management platform from the Institute for Quantitative Social Sciences at Harvard. Designed originally to address the needs of researchers in the social sciences, Dataverse is growing to encompass a much broader range of research data types. The Scholars Portal implementation of Dataverse is offered to OCUL libraries and researchers at Ontario universities at no charge and with limited support. Individuals and institutions can sign up for accounts and create and manage individual “dataverses”, a kind of organizational “wrapper” for grouping related studies and data files. Dataverse supports data publication, through the assignment of persistent identifiers, and integrates with the PKP Open Journals System to support the publication of data sets with research articles. To date, just over 400 studies representing 5,300 data files have been posted to the Scholars Portal Dataverse. A few OCUL libraries have created institutional accounts and integrate Dataverse as part of their local RDM support services. Other OCUL libraries have referred researchers to the Scholars Portal Dataverse as a location for storing and managing data files but have not established an institutional presence in Dataverse.

With respect to the preservation of research data, Scholars Portal has been an active participant in the Canadian Polar Data Network for several years. Working with the University of Alberta Libraries, Scholars Portal has provided preservation services for data deposited with CPDN, including the research data created as part of the International Polar Year project. Staff from Scholars Portal have also been engaged with the work of Project ARC (now Portage),

¹⁴ <http://www.ocul.on.ca/node/2164>

participating in design discussions concerning a proposed national preservation infrastructure that would be developed in partnership with Compute Canada.

To enhance our own data preservation capacity, Scholars Portal has pursued several related projects over the course of the last two years. The first project, the Ontario Library Research Cloud, provides geographically replicated, large-scale storage of digital objects using modern cloud-based technologies. Based on OpenStack Swift, the OLRC provides Scholars Portal and OCUL libraries with preservation-quality storage that can be integrated with a wide range of repository tools.

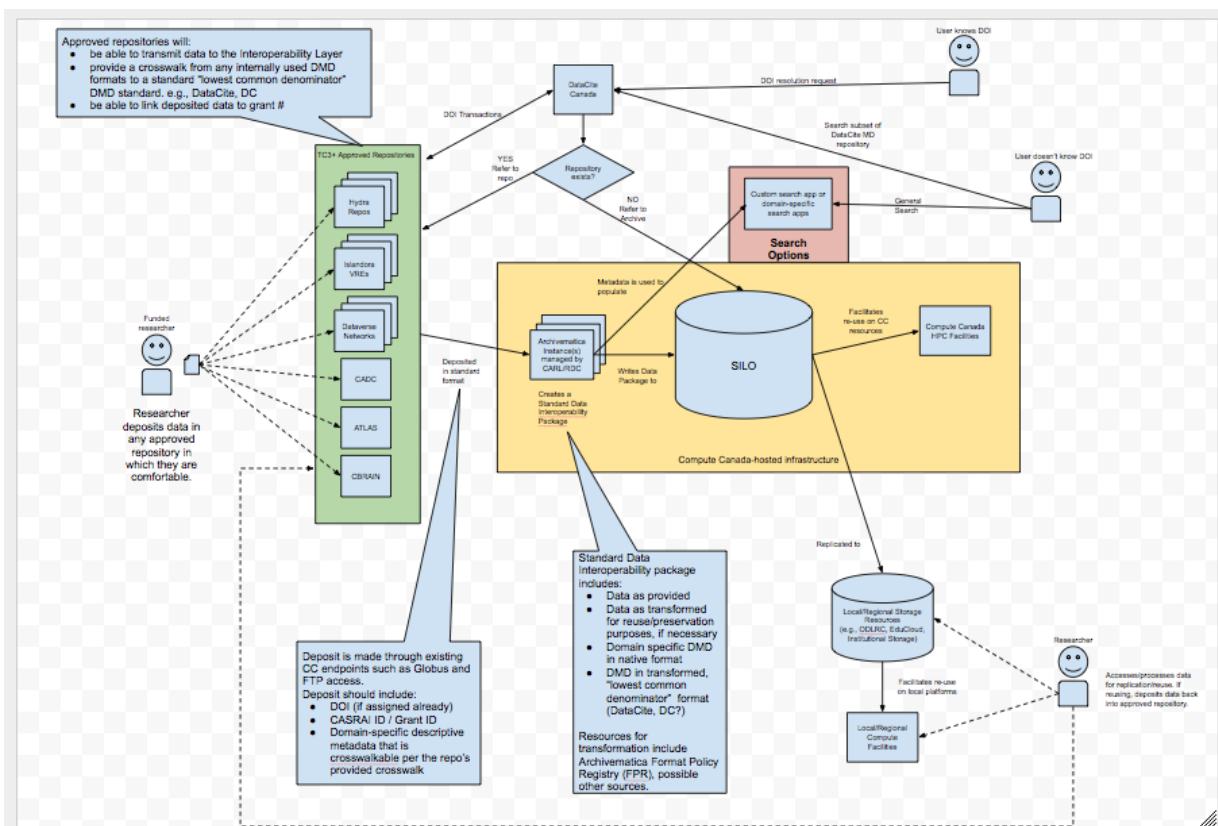
One such integration involves connecting the OLRC to Archivematica, the preservation processing tool proposed as the backbone for the Portage network. Archivematica is a comprehensive suite of data characterization and normalization tools used to create properly formed, self-standing archival information packages. These packages are constructed according to recommendations of the Open Archival Information Systems model and are suitable for long-term preservation. In 2014 and 2015, Scholars Portal worked with Artefactual Systems, the creators of Archivematica, to add OpenStack Swift as a storage service within Archivematica. This functionality allows OCUL libraries that use Archivematica to target the OLRC as a destination for archival packages. It also will serve as the basis for a new preservation service called Permafrost to be offered by Scholars Portal to OCUL member libraries that have content that they want to preserve but lack local resources to archive and manage that content.

To introduce preservation capabilities to Dataverse, Scholars Portal has also been working with Artefactual Systems to design and develop an integration module between Dataverse and Archivematica. This will allow research data to be passed from Dataverse to Archivematica for archival processing and then stored in the OLRC via the new Archivematica-Swift storage service. This combination of Dataverse-Archivematica-OLRC will provide a basic stack of research data preservation services for Scholars Portal and for those OCUL libraries using Dataverse as a content management tool for research data.

Scholars Portal and Portage

Opportunities

Portage envisions a preservation backbone based on Archivematica, with the initial pilot testing Archivematica integration with Compute Canada storage services using the Globus Network. Globus provides services for the high-speed transfer of large datasets between Compute Canada nodes as well as a data publication service in Globus Publisher. The following diagram developed for the Portage project shows various elements of the proposed national network.



In this network model, it is possible for different services to be managed centrally and others to be managed regionally or institutionally. More than that, the model can entertain configurations where a particular service is run at multiple levels, different for different organizations or content types: at a national level for institutions without regional or institutional resources to support such a service, and at a regional or institutional level for organizations with sufficient resources and a desire to maintain control outside of the national context. The Portage model is multi-tiered and configurable to support a wide range of implementations.

This flexibility would allow Scholars Portal, for instance, to provide regional services to OCUL libraries participating in the national Portage project, with data being ingested through institutionally hosted or Scholars Portal hosted services such as Dataverse, processed for archiving regionally in Permafrost, and then stored in the OLCRC with the option of replication to a Compute Canada storage service via Globus or a local storage service for institutions that want to manage local copies of their research outputs. By creating a regional RDM service that conforms to the Portage network model, these kinds of integrations and others should be possible.

Why should OCUL invest in developing regional capacity for RDM if Portage is going to be providing similar services at a national level? The Portage network has always been envisioned and described as a distributed network. Rather than developing new infrastructure, it would

where possible leverage existing investments across the country. In this respect, OCUL and Scholars Portal, in partnership with Portage, could provide RDM support services for institutions and regions without the kind of history of shared infrastructure development that Ontario has. At the same time, by creating a regional node within Portage, OCUL could create the framework for enhanced collaboration within Ontario for RDM support. Libraries, in partnership with the other RDM stakeholders, could work together on developing common policies regarding costing, retention of data, privacy and IP protection. Likewise, building on the experience of the OCUL Digital Curation Community, libraries could collaborate on developing a strong community of practice in Ontario for RDM, working on shared training and education and creating a common pool of highly-trained data scientists.

Why then should OCUL participate in Portage if it has the capacity collectively to meet the needs of Ontario researchers independently of Portage? Access to funding opportunities at the national level could be an important consideration. As a node in the national Portage network, OCUL may have access to funding sources that it would not be eligible to access as a provincial organization. Research often crosses regional boundaries, so developing RDM support services in a national context also better reflects the reality of how researchers work. And there are strong reasons from a preservation perspective to participate in a broadly distributed, technologically heterogeneous storage network. Adding options for replicating data in OLRC to other storage services in the Portage network would create a robust distributed preservation network along the lines of the DPN Network in the US. Other important considerations include the value of aggregation of metadata at a national level to enhance discovery and closer integration with high-performance computing infrastructure to support reuse of large datasets.

Gaps

Scholars Portal and OCUL librarians have been involved in various aspects of Project ARC and Portage. It will be difficult to realize the vision of Portage, however, unless a broad range of dedicated resources can be brought to the project. Portage will be looking for funding from national agencies, but will also be relying on contributions of in-kind resources from institutions and regional organizations. At the present time, Scholars Portal lacks the capacity to participate in a meaningful way in the development of Portage services. As described above, with funding from OCUL, we are working toward development of a data preservation stack based on Dataverse-Archivematica-OLRC, but integration of that stack within the Portage network and with institutional RDM services will require more resources than have been secured to date. If we want to expand our engagement with Portage into areas related to education and training, data management planning, discovery and access, and data reuse, we will need to add expertise to the Scholars Portal team. A base level of support would include 0.5 FTE for each of a librarian, a programmer, and a systems specialist. Release time of existing staff for project management support would also be required. The staffing model we adopt for building RDM capacity in Scholars Portal could see some of those positions hosted or “embedded” in OCUL libraries, providing a tie between institutional programs, regional efforts, and national projects like Portage.

To help guide the work of Scholars Portal in developing services that will be meaningful for OCUL libraries in the national context, a new OCUL RDM advisory group would be helpful, drawing on expertise from the OCUL Digital Curation, Data and GIS Communities. Ideally, members of this group would encompass the entire data management lifecycle, including preservation, access, data management planning, training and policy, and would engage with the Portage expert groups. Working with a group of early adopter libraries to develop a service model for RDM support in Scholars Portal, identify costs, and explore integration opportunities with Portage may be a useful way to provide structure to Scholars Portal efforts in this area.

Helpful Readings

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