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How Libraries Help Make your Data Management as Easy as Pie

Jill Cofield, Carol Anne Germain, Lauren Puzier, Emily Kilcer

Jlansing@albany.edu, Cgermain@albany.edu, Lpuzier@albany.edu, Ekilcer@albany.edu

University at Albany

Abstract

Academic libraries at Association of Research Libraries (ARL) and Carnegie Research 1 (R1) universities in the U.S. and Canada provide leadership to deliver comprehensive integrated web-based data management services for faculty, graduate students, and researchers. Data management makes data more findable, usable, and reproducible; supports an ethical, responsible research environment; and meets funder and journal data-sharing requirements. Since the White House Office of Science and Technology Policy's 2013 memorandum requiring federal agencies to increase public access to the results of federally funded research, many funders and journals have mandated data planning and sharing. Developing high-quality data management plans takes time and requires training on essential elements and accepted practices. As a result, data management services are in demand by faculty, graduate students, and researchers. To that end, academic libraries have been developing a rich array of data management services that include support for drafting and reviewing data management plans; sharing best practices related to data sharing, storage, and security; recommending data curation strategies; and more. This poster discusses findings from a survey of 145 ARL and Carnegie R1 library websites in the United States and Canada related to the work libraries are leading to provide user-centered, web-based data management services. We share key data points; identify trends in the development of library-based data management services; and note recommendations for libraries to prepare for future growth in data management services as technology and research continues to evolve and expand.

Methods

- Identified 145 ARL and R1 library websites
- Limited to English language websites
- Web review
- Identified trends with data management services, including drafting and reviewing data management plans; providing best practices related to data sharing, storage, and security; recommending data curation strategies; and more.

Literature Review

How are data management services defined?

As defined by Briney (2015), "Data management is the compilation of many small practices that make your data easier to find, easier to understand, less likely to be lost and more likely to be

usable during a project or ten years later. Data management is fundamentally about taking care of one of the most important things you create during the research process: your data.” In the 2012 Association of College & Research Libraries (ACRL) baseline white paper, Tenopir et al. define research data services as “services that a library offers to researchers in relation to managing data and can include informational services...as well as technical services.”

What served as the major catalyst for libraries to provide data management services to users?

A frequently cited impetus for the expansion of the research data services in university libraries is the announcement made in 2011 by the National Science Foundation (NSF) requiring data management plans for future grant proposals to support reproducibility of studies, transparency, and expanded discovery. Akers et al. (2014) discuss how the 2011 announcement from the NSF prompted many libraries to expand the availability of resources and tools on the topic of data management and workshops and consultations to assist researchers with developing data management plans.

Further, in 2013, the White House Office of Science and Technology Policy issued a memorandum (National Archives and Records Administration n.d.) directing federal agencies with research and development expenditures exceeding \$100 million per year to increase public access to the results of federally-funded research. Many journal publications now require researchers to make data and underlying code publicly available.

What is the history of the role of academic libraries for providing data management services in universities?

Akers et al. (2014) studied the experiences of eight universities recognized as frontrunners for implementing research data management services and supports among services provided by their academic libraries. They found that as early as the 1980s and 1990, libraries reported working with researchers to identify and use existing data sets. And resulting from the emergence of digital repository software at the start of the 21st century, libraries began creating local repositories to capture institutional scholarship. This effort required new skillsets.

In 2012, Tenopir et al. conducted a baseline survey of academic library members of the ACRL in the United States and Canada to identify current research data services being provided in the field and future plans for expanding service offerings. At the time of the study, only a small number of academic libraries surveyed were currently offering research data services. Libraries in larger, doctoral degree granting institutions and those at institutions receiving NSF funding were most likely to offer data services. Web guides were the most frequently cited modality for providing research data services.

A 2020 Ithaka S+R report provided an updated assessment of the landscape of the delivery of research data services in libraries and confirmed the continued growth trend in services being provided by academic libraries to support research across the disciplines. In their analyses of

120 U.S. colleges and universities, Radecki and Springer (2020) found that R1 institutions now offer an average of 7.6 data services to researchers within their institutions. Services include consultations with researchers; training events; back-end work, including metadata, design, and formatting data for analyses; and front-end work, such as web development and data visualization. Among R1 institutions, only 20% of libraries in the sample did not offer any research data services.

Variables

- Scholarly communication (SC)
- Data services
- Data management plans (DMPs)
- Data sharing
- Open data
- Data visualization
- Geographic Information System (GIS)

Results and Discussion

Of the 145 ARL and R1 institutions studied:

- 138/145 (95.1%) libraries had access to information and resources on data services either through a SC page on the website and/or through a stand-alone page on the website.
- 137/145 (95.0%) libraries provide information on creating DMPs.
- 123/145 (84.8%) libraries provide access to GIS services
- 123/145 (84.8%) libraries addressed data sharing either through a SC page or a stand-alone web page, such as a LibGuide.
- 93/145 (64.1%) libraries had access to information and resources on open data, either through a SC page on the website and/or through a stand-alone page on the website.
- 101/145 (69.7%) libraries provide data visualization resources or services either through a SC page or as a stand alone.
- 101/145 (69.6%) libraries have dedicated SC pages on their websites
 - o Of the 101 institutions with SC web pages, 97 (96.0%) contained information on DMPs. Most linked users to the DMPTool, a free, open-source, online application that helps researchers create data management plans.
 - o 49/101 (48.5%) libraries' SC pages linked to pages with information and resources on data services.
 - o 35/101 (34.6%) libraries' SC pages addressed data sharing.
 - o Only 5/101 (4.9%) institutions address data visualization on their SC page.

Eighty-five percent (85%) of libraries reviewed offer integrated web-based data services for faculty and researchers where data management services are integrated into the library website and are logically organized. Services at these libraries were easily findable via the homepage. Of the remaining 21 libraries surveyed, six provide comprehensive stand-alone web-based data management services; five provide web-based data management services that are semi-integrated (not available in one place or logically accessible through web links); two make introductory reference to the availability of data management services; and eight do not currently provide web-based data management services.

Recommendations

- Thoughtful integration of data management services within academic libraries' websites is important for managing data management resources and encouraging uptake by the user community.
- "Take away" and "bite-sized" resources (e.g., FAQs, template plans, toolkits) simplify the data planning process for faculty, graduate students, and researchers.
- While libraries routinely borrow and openly share resources and tools among the scholarly communications community, customization matters (e.g., identifying a local expert and resources).
- Outreach to faculty, graduate students, and researchers is important for sharing information on the availability of data management services and technical assistance.

Key Resources

[DMP tool](#)

White House Office of Science and Technology Policy's 2013 memorandum - [Increasing Access to the Results of Federally Funded Scientific Research](#)

[DataOne](#)

[re3data.org](#)

Requirements by Federal Agency

Food for thought

From Johns Hopkins University – Data Grant

"Do you need a particular dataset to conduct your research? Is there a dataset that would be useful to your department or research group? Apply for a JHU Libraries Data Grant and, contingent on eligibility and availability, you will receive access to the data you need."

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