

Changing Landscapes: New Roles for Academic Librarians

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Abstract:

Both sides of the Atlantic forecast new roles for librarians in response to changes affecting research and scholarship in higher education¹. They share observations that academic librarians are positioning themselves to advance the mission of their institution in new ways. Changing landscapes bring new challenges for librarians to address, such as requiring data to be curated and shared, teaching digital literacy, and leveraging technologies and organizational structures to improve researcher productivity. In response, librarians are redefining their roles as leaders and partners with faculty, administrators, and students. This paper will focus on the evolving role of the academic librarian in the research life cycle to illustrate how U.S. academic institutions embrace these changes. The experiences of one mid-size U.S. university will highlight how becoming effective leaders and true partners require librarians to understand the changing requirements and practices facing researchers and students throughout the research lifecycle. Librarians are bringing their information expertise, organization skills, and professional values to innovative organizational settings that strengthen campus research infrastructures. The presenters will explore how the Association of College & Research Libraries (ACRL), a national library organization, leverages the effort of the professional community to offer education and support for these transitions. The paper will conclude with ACRL's strategies to prepare librarians to demonstrate its vision that "academic and research library workforce effectively navigates change in higher education environments."

Keywords: research data management, academic libraries, information entrepreneur, change, skills

Changing landscapes in pedagogy, scholarship, and technologies, as well as economic and societal expectations for accountability and contributions of the academy bring new challenges for academic librarians to re-define their relevance. There is no common strategy for librarians to support research data management [RDM] in higher education. Rather, professional values and strong commitments to improve society have drawn librarians to embrace RDM, which is unfamiliar territory for most. Recent skepticism of the value of research to inform popular opinion reminds librarians of their critical role to ensure access to authoritative information, and preserve research output and the cultural record.

In guiding RDM efforts, academic librarians have an opportunity to build institutional capacity for “intellectual entrepreneurship,” what Richard Cherwitz characterizes as a movement “from ‘advancing the frontiers of knowledge’ and ‘preparing tomorrow’s leaders’ to also ‘serving as engines of economic and social development.’” Academic librarians now have an opportunity to move beyond managing resources and guiding their use, to inspiring strategies for the social good through fostering collaborations such as open science.

In this paper we share our insights as two administrators who have worked to understand the challenges that research data poses for librarians and the opportunities to assume leadership roles to help academic institutions manage research data output. Our case study reflects the conditions and limited resources that characterize many small and mid-sized academic institutions in the United States and reflects the struggle to adapt to new mandates to preserve research data without strong campus system infrastructure, or awareness. Our shared interest has been to find ways to help prepare librarians to tackle challenges of leveraging research data as an institutional asset.

We reflect two U.S. perspectives derived from both a national view and one institution’s activities.

Specifically:

- The Association of College & Research Libraries (ACRL), a national library organization, leverages the professional community to offer education, assessment, and support to prepare librarians for the challenges of RDM.
- Librarians, administrators, students and faculty at Drexel University, a mid-size private university in Philadelphia, are experimenting with different approaches to strengthening the institution’s infrastructure by including RDM within the research life cycle and more effectively contribute new knowledge to society.

This paper presents our story around the following insights and activities:

- An unfamiliar research data landscape poses new challenges for institutions of higher education and the libraries that support them.
- Librarians respond to the challenges in different way, reflecting local expectations, available resources, and expertise.
- Librarians can develop the competencies needed to take on new leadership roles that illustrate information entrepreneurship.
- Transformed organizational structures and partnerships strengthen research capacity.

Together, we uncover emerging competencies for the librarian intellectual entrepreneur and identify effective practices that libraries are exploring.

Research data landscape poses new challenges

Traditionally libraries have preserved publications as the final research outputs. Now mandates from funders and governmental bodies as well as the emergence of open science require the data underlying the research results to be preserved and made accessible. Research data and the data analyses have long remained within the purview of the originating researcher. These research outputs are now emerging as valuable assets that can be used to ensure replicability and as a springboard for further discovery and use in advancing knowledge.

Making sense of these research building blocks requires attitudinal changes toward ownership of data, trust in the value of sharing them, and understanding systems and protocols for their management. Academicians disagree on the cultural changes needed to master literacies involving management and use of digital information and data.

Managing research data throughout the research life cycle poses demands on researchers and librarians. These include:

- Organizing research output to deal with sheer volume of data generated and determining which data sets need to be preserved.
- Applying effective practices to describe, organize, discover and access data sets that differ from the long-established traditions librarians follow for curating bibliographic information resources.
- Enabling communication and collaborative practices among people involved in generating the data, especially when as many as hundreds and even thousands of researchers are involved in a project (Data Team 2016) during the research life cycle.
- Abiding by government and other funding agency directives that require data management planning, and more importantly, its implementation to advance principles of open science.

Awareness and adoption of effective practices to manage research data improve an institution's ability to broaden access to its research assets. Additional benefits also accrue to the institution including:

- Enhanced research reputation and competitive edge in recruiting and retaining faculty and students.
- Raised expectations for researcher productivity and student mastery of data and digital literacies.
- Updated technologies to stay abreast of emerging formats for scholarly communications.

Librarians in different settings can respond to the challenges

Libraries differ in their capacity to respond to campus needs to manage research data. Available resources as well as the size and expertise of library staff to share or assume new responsibilities affect the level at which librarians have been able to engage in this arena. The very recognition that librarians may contribute to support research varies among institutions. U.S. research-intensive institutions, such as the University of Michigan, Purdue, Johns Hopkins, and MIT, were early to recognize the value of academic libraries. They invested resources to design and implement innovative systems and protocols to support and partner with researchers. However, not all libraries could be early adopters of RDM initiatives. Numerous librarians joined other information scientists to design new protocols and systems, while others sought ready-made solutions to adapt.

While some thought that RDM was a problem only for the research intensive institutions, the Association of College and Research Libraries learned that data management is among the top three issues that concern academic librarians at all types of institutions. The other two top issues—articulating the value of academic libraries and dealing with change—also extend to the data management landscape. In developing a library strategic plan, Drexel sought community assistance to advocate for the value of the Libraries and its contributions to the University. Following protocols in place elsewhere, librarians designed support services for research output management, while recognizing their limitations in affecting change.

1. Drexel Libraries transforms the library and embraces RDM.

Responding to the challenges of research data is one example of an ongoing transformation of the Drexel Libraries started in 2010. The Provost recruited the dean with a challenge to clarify a vision for the first part of the 21st century and redefine a neglected library. She conducted a Future Search retreat that engaged stakeholders to explore how the library could advance the university's mission (Nitecki et al 2013). The results helped to generate a set of strategic directions that guided staff to strengthen services, form partnerships, and build an infrastructure. These directions articulated the Libraries' value including ensuring access to authoritative information, building learning environments in physical and cyber spaces, strengthening Drexel's connection to scholarship, and modeling an evidence-driven and customer-oriented organization. As a result, staff increasingly engaged in strategic thinking and assumed managerial leadership roles, while designing services focused on ensuring access to information resources and forming partnerships with faculty and staff to improve student success.

After five years the Libraries revisited its articulation of value amidst an environment for increased accountability and diminishing resources. Librarians saw support of RDM as an opportunity to redefine the library's value, challenged by scarce campus awareness of the funding requirements to manage research data output. The refreshed strategic directions below more explicitly align with the University's strategic initiatives that include ambitions to become a comprehensive research institution:

- Connect Drexel to scholarship: engage the library in the entire research life cycle including managing research data and publication outputs for global discovery, retrieval and use by other researchers.
- Model an effective organization: increase partnerships of librarians and campus staff who help faculty submit and track research projects, and promote university research trends and reputation.

Engaging in these new ways of assessing and articulating the value of the library has required that staff reconceive their work, acquire new technical skills, and develop confidence in building different relationships with clients and peers.

2. How ACRL responds to challenges to assist its membership

Members organized several Communities of Practice within ACRL to share information and learn from each other. The new Data Curation Interest Group (DCIG) quickly grew to more than 1,000 members. The leaders of these groups were connected to many other technical groups considering data management issues outside of ACRL, and realized that ACRL could help at the entry level by identifying what librarians need to understand about data management, why and how they should be involved in the research lifecycle, and how they could position themselves as credible with faculty researchers. The DCIG created an electronic discussion list where members easily pose questions and seek advice on common challenges. DCIG leaders assisted us in engaging Drexel faculty and librarians experienced in data management to discern how faculty did their research, in what ways librarians could help, and what were the best initiatives for ACRL to consider that did not duplicate initiatives at other organizations (Davis & Nitecki 2016).

Identified new roles for academic librarians

We recognized common insights from the ACRL and Drexel responses to the research data challenges, and highlight some new roles for academic librarians.

Most academic librarians are comfortable with service roles, assisting people accessing information, and teaching students how to use and create resources ethically. Some librarians are far less comfortable in engaging with faculty and with research beyond assisting with literature reviews. The current challenges around RDM provide opportunity for more academic librarians to step out of their comfort zones and become “information entrepreneurs.” As Abosedo & Onakoya (2013) cite Cherwitz and Hartelius (2007), this involves

creating synergistic relationships among academic disciplines and between intellectuals on and off campus in order to sew seamless connections among disciplines and between the academy and the public and private sectors. Intellectual entrepreneurship is about harnessing, integrating and productively utilizing intellectual energy and talent wherever it is located in order to promote academic, cultural, political, social and economic change. Intellectual entrepreneurship takes advantage of the knowledge assets contained within walls of the university and empowers faculty and students to become change agents both internally and externally.

Academic librarians are challenged to:

- Become **proactive designers of services** that enable productive knowledge workers.
- **Partner in knowledge-generating activities** bringing understanding of the information and data landscape and its tools for discovery and utilization.
- **Share project management roles** to increase research team productivity.
- Be **change agents** that build evidence to monitor efficiencies and gauge impact.

These roles may require librarians to strengthen and/or develop new skills in areas such as interpersonal communications, organizational change leadership, outcomes achievement and assessment focus. Leadership in this arena requires self-motivated, research-grounded, intellectual entrepreneurs.

Developing skills to assume leadership roles

In preparing its membership for new challenges, ACRL initiatives help identify and develop skills that have multiple applications. For example, in 2010, ACRL launched an initiative (Assessment in Action, n.d.) to document library contributions to student success, including education for librarians in assessment techniques, creation of communities of practice, and experience in advocacy and leading campus-wide teams. Skills acquired through this initiative are widely applicable to assuming leadership roles in the RDM arena.

In response to more librarians being assigned assessment duties, an ACRL Task Force worked to develop proficiencies for assessment librarians, collecting over 250 potential proficiencies, which were articulated across eleven broad categories. We assert that each of these areas reflects skills that also apply to assuming new roles in RDM including:

1. Knowledge of assessment in libraries and higher education

2. Ethics
3. Assessment methods and strategies
4. Research design
5. Data collection and analysis
6. Communication and reporting
7. Advocacy and marketing
8. Collaboration and partnerships
9. Leadership
10. Management
11. Mentoring, training and coaching (ACRL 2017)

However, we recognize that these skills are not enough on their own. Through discussions with expert ACRL members and examining the literature (Piorun 2013) we propose additional abilities needed for RDM support, including:

- Deep understanding of the research lifecycle
- Understanding of how to develop infrastructures for description, discovery and retrieval of research data
- Adapting literature review practices and citation styles for data sets across disciplines
- Ability to simplify compliance regulations and articulate the rationale for sharing raw data and publications to advance e-science
- Ability to develop archival services for data “at rest” including metadata creation, organization, and preservation
- Ability to assess and identify trustworthy repositories managed by associations or government agencies
- Willingness and ability to design workspaces for researchers to collaborate
- Knowledge of how to review and propose institutional policies to clarify intellectual property rights, compliance and regulations regarding research data.
- Ability to apply data mining and analytics to demonstrate evidence of faculty productivity, research impact, trends and rankings.

Preparing for new RDM roles by developing librarians’ skills and improving library organizational structures

OCLC recently categorized RDM initiatives; we suggest applying these categories to library staff development:

- Education: to raise awareness of RDM importance, encourage skill building and disclose tools and resources.
- Expertise: to provide decision support for and customized solutions for specific RDM problems.
- Curation: supported by technical infrastructure and related services that support RDM throughout the research cycle (Bryant et al 2017).

In Europe, supporting e-science predates interest in the U.S. (Lippencott 2010). Beginning in 2001 the Research Councils in the United Kingdom [RCUK] invested in a national infrastructure to ensure the preservation and curation of research data and to build tools for use by collaborative research communities even when geographically dispersed. In 2006 the Joint Information Systems Committee [JISC], the Research Information Network [RIN] and the British Library continued to build the infrastructure. Their report advocated for the role of

librarians in e-sciences, and stressed the importance of funding for additional training and communications on the importance of metadata and subject-based research repositories (Piorun p 35). Best practices for research data curation and advice on metadata standards, data management plans and repository standards were among the documented resources that the UK Digital Curation Center provided among the JISC funded initiatives. The role of data librarians in training researchers and new data librarians in archiving and preserving data emerged.

By contrast, Piorun cites studies in 2013 of U. S. libraries [Cox and Pinfield) as well as those in Australia (Corrall, Kennan, and Afzal 2013) that found that fewer services were offered and that librarians needed to have a stronger understanding of research life cycles, including research methodologies and workflows to design and deliver helpful support. U.S. librarians have learned that time and resources are needed to prepare data management plans, review system applications for added tools, and identify campus experts. Although solutions have situational variations, the profession is seeking shared principles and successful practices to assert new librarian roles. Librarians are continuous learners and this may have encouraged some to begin their planning efforts by developing an understanding of their communities' research activities. These efforts underscore the need for an ability to develop partnerships, build trust, be effective listeners and conduct inquiries of their own.

A recent Sloan Foundation-funded initiative involved six large U.S. academic institutions, which formed a Data Curation Network to:

Share data curation staff across a 'network of expertise' to enable academic libraries to collectively, and more effectively, curate a wider variety of data types (e.g., discipline, file format, etc.) that expands beyond what any single institution might offer alone. ... [And also] sharing of datasets to advance knowledge, and grow a community that enriches capacities for data curation writ large. (n.d.)

This project complements initiatives to help address RDM challenges.

ACRL initiatives

In 2016 the ACRL's Board of Directors responded to member interest in adapting to new roles, and added to its strategic plan a fourth goal, "New Roles and Changing Landscapes" that states, "Academic and research library workforce effectively navigates change in higher education environments. (ACRL, 2016)" Its objectives are:

- Deepen ACRL's advocacy and support for a full range of information professionals.
- Equip library workforce at all levels to effectively lead, manage, and embrace change.
- Expand ACRL's role as a catalyst for transformational change in higher education.

Further recommendations include developing documents to support librarians undertaking new roles, with background information about the domain, expected competencies, and a variety of training opportunities. A recently hired ACRL staff member experienced in organizational development and change management is working to expand ACRL's consulting services and professional development around change.

Meanwhile, ACRL's DCIG continue to develop webinars, online discussions, and a toolkit of resources about data management issues, while new interest groups formed with focus on

numeric and geospatial data services, and digital humanities. In 2017, a new Digital Scholarship Section (DSS) formed to coordinate these various efforts.

ACRL also contracted with several data management experts to develop a stand-alone “road show” workshop. It was piloted at ACRL’s 2015 Conference, refined and made available for licensing. The licensed workshop includes two presenters and a curriculum delivered at a location of the licensee’s choosing so that institutions can take advantage of affordable learning opportunities delivered locally.

Drexel initiatives.

Since 2010 every position vacated during the past seven years has been reviewed in terms of proficiencies the organization most needs and nearly all recruitments were for newly defined positions. As a result, expertise has been added or raised in data analysis, communications and marketing, financial analysis, discovery systems, data services, undergraduate student learning, records management, and some discipline knowledge of pedagogy, research methodologies, and scholarly communications. Intentional recruitment focusing on proficiencies as well as personal traits has enhanced the organization’s talent and capacity to be flexible, nimble and innovative in responding to change.

Beginning in 2013, the Dean of Libraries engaged with a Provost-appointed Committee to make recommendations as to what was needed to strengthen the University’s infrastructure to support research. The 2015 report included a key recommendation to affirm the principle that data are considered an institutional asset subject to records management. However, no executive rose to champion that principle, and changes in administrators and reduction of campus revenues hampered progress in responding to RDM challenges. The Libraries persisted, realigning its staff, redefining vacant positions, and creating a division of Data and Digital Stewardship (DDS)

In 2016 the Libraries dean and the new director of DDS convened the Data Stewardship Forum, a self-governed assembly that included administrators and faculty expert in compliance and privacy, general legal counsel, management of research grant awards, graduate education, information technologies, procurement, STEM research, outcomes assessment, and library and information science. The Forum has begun to review policies, explore venues to raise campus awareness, conduct an assessment to understand faculty needs, and share information about relevant campus activities. One of Drexel’s biggest challenges involves the information technology infrastructure which requires having adequate storage and tools for faculty to work with data across teams and during research projects, as well as capacity for long-term discovery and retrieval of data by persons beyond the project team. The infrastructure needed to provide this basic component to advance open science were unfamiliar to many and librarians have taken the opportunity to raise awareness of this while enhancing their own understanding of implications.

This past year librarians have worked with five groups of faculty who received support for creating research centers aligned with the University’s focus to build distinctive interdisciplinary research signatures. The librarian works first to understand the group’s research and management efforts to help identify support opportunities. Initial faculty engagements revealed a wide range of understanding about RDM requirements. Only one of the five groups has a clear appreciation of the need to manage research output and welcomed partnership with the Libraries. Two of the groups were interested in ways to engage students

in research and could imagine librarians coaching students in information literacy skills that include research data retrieval and curation. One group requested the librarian to conduct literature reviews and perhaps was not appreciating the strategy to build the team's capacity by training and mentoring team members to do these reviews. The uniformly observed weakness at this early stage of the development of research centers is the lack of strong managerial leadership among the faculty. This provides an opportunity for librarians who are recognized as grounded in information and project management as well as operating services to contribute to the research center.

Insights from our case studies

1. Research output (data and publications) is not intuitively viewed as an institutional asset.
2. Research data management provides librarians at all types of academic institutions opportunity to assume new roles central to the institutions' mission.
3. New organizational structures and partnerships enable librarians to better position their new roles.
4. New competencies are required to fully participate in RDM.
5. Skilled librarians are valued to strengthen the university's capacity for leveraging research and improving global reputation.
6. Associations, institutions, and communities of practice are developing resources to help librarians succeed in their new roles.
7. Academic libraries respond to the RDM challenges in different ways based on capacity.

Our closing advice, based on our experience with exploring RDM, can also be applied to introducing other new services:

- Don't assume you fully understand the challenge you are trying to address.
- Engage with the community to understand their work, from their perspective, before developing a solution.
- Engage stakeholders to appreciate how your proposed solution will improve their work by posing risks they might need to manage. For example with RDM, ask what they would do if a reader challenges published research results or a funder questions issuance of a grant based on reported fake data.

This is our moment to embrace change, learn new things, and establish new roles for librarians. Paraphrasing Eric Hoffer, in times of change, learners inherit the future, while others find themselves equipped to deal with a world that no longer exists (Hoffer1973).

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