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Stacy L. Winchester
University of South Carolina - Columbia

Amie D. Freeman
University of South Carolina - Columbia

Kate F. Boyd
University of South Carolina - Columbia

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From the Ground Up: Building a Digital Scholarship Program at the University of South Carolina

Abstract

In 2019, the University of South Carolina Libraries launched a new department called Digital Research Services to support new and evolving forms of scholarship in the digital age. Departmental librarians will discuss the experience of planning and implementing a digital scholarship program and will provide suggestions for other libraries planning a digital research initiative.

Keywords

digital scholarship, digital humanities, data management, data visualization, GIS, technology, scholarly communication

Introduction

"Scholars throughout the ages have used whatever devices were available to them to communicate their reflections and findings, to ask questions and to invite the engagement of readers," stated Hariette Hemmasi, Georgetown University Librarian (CNI workshop, 2020). The research paper remains an essential assignment. However, it is more important than ever that librarians support students and faculty in critical thinking, regardless of the medium used to express those ideas. A 2018 OCLC Report emphasized the shift from a print-centric scholarly record to a more expansive and intangible academic output, made up of nontraditional scholarship such as datasets, code, and digital publishing (Bryant et al., 2018). It is necessary to recognize this changing landscape of scholarly communication and to ensure that the library is a part of that evolution.

There are many ways to plan for digital scholarship services and much librarians can do with the resources currently available to them. According to the 2016 Association of Research Libraries (ARL) Spec Kit on Digital Scholarship, many ARL institutions offer dedicated units to support digital scholarship and digital humanities through the provision of advice and participation in faculty research (Mulligan, 2016). More and more, librarians are including new spaces and technology while also assisting faculty and students with every part of the research lifecycle. This article will explain how UofSC Libraries initiated the planning and formulation of a Digital Research Services department, describing the current services provided and including recommendations for other academic libraries.

Framework and Planning

In July 2018, Kate Boyd, the University of South Carolina Libraries' Digital Initiatives Librarian, was asked to investigate the possibility of introducing new digital scholarship services in the Libraries. Boyd, who had over fifteen years of experience developing the Digital Collections Department and had worked with faculty and the Digital Humanities Center on campus to create digital projects, was eager to

tackle this new objective. She chaired a task force that fall which conducted a needs assessment on campus, compared UofSC Library services with other academic libraries, and determined what the Libraries could accomplish in the coming years.

On campus, the task force conducted three faculty member focus groups from the Humanities, Social Sciences, Sciences, and one focus group of graduate students, interviewing a total of seventeen faculty members and six students. Boyd also spoke with another ten faculty individually, and the Technology Lounge manager toured other facilities on campus to learn about their resources. Through these interviews and tours, the task force learned that faculty want help with data management, that social sciences are increasingly required to share their data when publishing an article, and that an increasing number of classes are using alternative means for students to create content, such as podcasting and 360 videos. Furthermore, they came to understand that there is specialized technology available in pockets and scattered around campus for specific departments, but not much is widespread and available to all. It was also apparent that the university's Esri ArcGIS contact, who resides in Geography, is in very high demand and needs support.

The task force also studied other academic libraries that are successfully deploying digital scholarship services. Members of the group attended a Digital Library Federation series called the eResearch Network, where through Zoom calls they met other practicing digital scholarship librarians across the country. Two librarians visited the University of Tennessee - Knoxville Library's Scholar's Collaborative and learned about their multimedia centers and research data practices. The task force also conducted a literature review and called librarians at other universities to learn how they manage such a department or suite of services. Confirming the findings of the ARL SPEC Kit through phone conversations and web site reviews, the task force learned that about half of ARL libraries have some sort of digital research or digital scholarship services and most now have a scholarly communications librarian and a research data librarian (Mulligan, 2016).

In January 2019, Boyd gave a final report to the Libraries' faculty. With administrative support and a small amount of internal funding, the Digital Research Services (DRS) department was formed and began promoting current and forthcoming services.

Overview of Services

The Digital Research Services' mission is to provide library support for every step of the research life cycle and to lower technology barriers that faculty and students might encounter when acquiring, managing, or presenting data. Abby Smith Rumsey, former Scholarly Communications Institute Director of the University of Virginia, described Digital Scholarship as the "use of digital evidence and method, digital authoring, digital publishing, digital curation and preservation, and digital use and reuse of scholarship" (Mulligan, 2016). At UofSC, digital scholarship includes support for data management, digitization, multimedia services, scholarly communication, the institutional repository, data visualization, data analysis, technology spaces, and digital publishing. Although these services are primarily delivered through workshops and consultations, providing patron access to spaces and technologies is also an important role of Digital Research Services. The department does not have the capacity to assist with every technology need, so it operates as not only a service provider but also a connector, referring patrons to pockets of expertise and service elsewhere on campus. DRS librarians also continuously seek to learn new skills that can be incorporated into the Library's services.

Spaces and Technology

In response to evolving multimodal research practices, the library must become a place where faculty and students feel free and at ease to try new technology and software. Furthermore, to facilitate discovery, creation, and learning across campus, technology needs to be embedded in a central location, such as the library. Many academic libraries at Carnegie R1 Research Institutions across the country

have developed spaces that allow students and faculty to experiment with technology. From the University of Virginia's Scholar's Lab and Clemson University's Adobe Digital Studio to the University of Illinois's Media Commons and Case Western's Freedman Center for Digital Scholarship, libraries are making every effort to assist faculty and students in learning technologies that will facilitate new research questions. Examples of these spaces in libraries include podcasting rooms, video production rooms, and virtual reality rooms. Additionally, these libraries often loan technology such as cameras, Go Pros, video cameras, tripods, and magnetic media digitization equipment.

Responding to the need for more technology that is accessible to all on campus, Digital Research Services, with support from library faculty, staff, and the administration, expanded technology offerings in the Library. The Dean of Libraries provided funding for new equipment and spaces, while the Library faculty also applied for grants.

In Spring of 2019, the Libraries received a Vice President for Research Aspire III internal funding grant to create a Podcasting and Video Production area near the Library's Technology Lounge. Designed and managed by the Technology Lounge manager, these spaces opened in January of 2020. In the first three months before the COVID-19 closure and without time for much promotion, nineteen people attended the orientation to use the spaces. Five people signed up and used the podcasting room while four people used the video production room.

With the Library funds, equipment was purchased and a small Data Visualization Lab was set up. The Technology Lounge can now loan two Canon DSLRs, a camcorder, a GoPro Hero, a GoPRo Fusion, and two tripods. So far, about thirty people, mostly undergraduates, have checked the equipment out each of the two semesters it has been available. The Canon DSLR is currently the most popular piece of equipment, but the GoPros and Camcorders are being used as well. Physical space from the Government Information and Maps Department was reallocated to create a small Data Visualization Lab that includes a large screen and three GIS computers.

Data Visualization

Geographic information system (GIS) and, more recently, data visualization have been growing services in libraries since the 1990s. The University of Minnesota and Pennsylvania State University were two of the first academic libraries to hire GIS Librarians in the early 1990s. By the 2000s, GIS had evolved. More people outside of Geography units on campus were using it, and libraries were taking notice, starting to hire GIS Librarians in Government Documents, Maps, Reference, and other departments (March, 2017). In 2015, Holstein surveyed ARL member libraries to find that 74% were providing some GIS services (March, 2017). GIS services often include setting up accounts for patrons, teaching researchers how to use the Esri product, and assisting with finding data. In the 1980s, UofSC's Geography Department formed one of the first academic partnerships with Esri, the creator of ArcGIS. Traditionally, UofSC's Geography Department has managed support across campus, but in the last ten years, their requests have increased substantially. Liaisons, such as the Government Information and Maps Librarian, in the Libraries have noticed and reached out to support.

When a Government Information Librarian retired in 2019, the position description was updated, and a PhD in Geography was hired as UofSC's first Data Visualization Librarian. He remained at the library for less than a year, having gained a position as a professor at another university, but his impact was clear. He immediately made connections on campus and had a close working relationship with the GIS systems administrator. He organized the Libraries' first GIS, data visualization, and Python workshops, all of which were well attended and given favorable reviews. He arranged the opening and management of the Data Visualization Lab, assisting students with ArcGIS. It was an active year in GIS and Data Visualization, and then there was a hiatus with his departure and the onset of COVID-19.

Historically, GIS was often the first data visualization service offered by academic libraries. A 2013 ARL Spec Kit further stated that as data management grew in libraries, both of those services became more refined. Today, new, more generalized data visualization services continue to be added

(Fearon et al., 2013). Tableau and Microsoft's Power BI are two examples of fast-growing software that are easier to use than GIS and increasingly available on campus. DRS offers support for both. Currently, a librarian from Research and Instruction provides Tableau workshops. As the data visualization field continues to expand, DRS will stay abreast of the changes and adapt.

For Libraries interested in expanding technology and data visualization services, applying for funding, attending workshops, and networking on campus are recommended. Technology is often costly, so finding funding is pivotal to expanding access for students and faculty. The opportunities for offering data visualization assistance are growing and becoming much more accessible. Librarians should take advantage of online workshops and find out who else on campus also holds expertise in these areas.

Scholarly Communication Services

Scholarly Communication is recognized as a core competency of librarianship (ACRL, n.d.). In 2003, an ACRL report identified several strategies that should be considered to reform the scholarly communication system, many of which would require significant financial and staffing investments by libraries (ACRL Scholarly Communications Committee, 2003). Until 2015, however, the University of South Carolina Libraries did not offer formal services related to scholarly communications. In 2015, a Scholarly Communication Team was formed, with the goal of "developing strategies to educate and engage University of South Carolina library employees and the campus community regarding scholarly communications issues" (UofSC Libraries, 2015). This team, made up of staff across the Libraries, was able to develop new services and polices but was limited in the ability to commit to providing regular offerings long-term. Around the same time, the institutional repository librarian retired, leaving a service gap temporarily filled by the chair of the team.

Thus, it was decided that it would be logical to formally add scholarly communication services, including repository oversight, to the new Digital Research Services department. Because of preparation through coursework and the prior experience of an interlibrary loan librarian in leading the Scholarly Communication Team, this librarian moved into the newly formed role of Scholarly Communication Librarian. While the move may have been nontraditional, the transition led to the development of many new services and programs. A discussion of these new and developing services may be of use to other libraries committed to creating and growing digital research programs.

Open Access

Support for open access initiatives is a service regularly offered by libraries involved in scholarly communication. While UofSC Libraries was committed to providing regular workshops and consultations related to open access, researcher needs quickly progressed beyond these educational services. Working with campus collaborators, the Libraries developed a fund to support author processing charges (APCs) to allow researchers without grant funding to publish in open access journals. Additionally, memberships with certain publishers, including MDPI, Sage, and American Chemical Society (ACS) provided APC discounts to researchers. Beyond funding support, DRS grew repository services to promote open access not affiliated with author charges, such as research archiving and technical support for publishing open access journals. These essential services have quickly grown in popularity and use and are suggested as preliminary focus points for developing scholarly communication. To learn more about open access services through UofSC, visit the Open Access Guide at https://guides.library.sc.edu/openaccessresources.

Open Educational Resources

While a majority of faculty are now familiar with the term open educational resources, or OER (Seaman & Seaman, 2019), many faculty remain unsure of how to use these materials. Scholarly communication responsibilities typically include support for the adoption, adaptation, and publication of

affordable learning resources (NASIG, 2017). UofSC Libraries, building upon an annual award to encourage faculty to adopt OER, have increased OER support by providing syllabus review services, hosting regular Open Education Weeks, offering workshops on OER and open pedagogy, and through regular consultations. These low-barrier activities have resulted in significant cost-savings for students, totaling over $1.5 million. Libraries developing scholarly communication services might consider including general or focused assistance for OER. In South Carolina, librarians can find support for the implementation of these endeavors through South Carolina Affordable Learning (SCALE), an initiative of the Partnership Among South Carolina Academic Libraries (PASCAL). Information about SCALE is available at https://pascalsc.libguides.com/scale.

Institutional Repository

UofSC Libraries has provided access to Scholar Commons, an institutional repository, to archive and share faculty and student research since 2010. However, researcher participation was limited. To increase the use and impact of the repository, DRS immediately set out to refresh the site appearance and make the repository more user-friendly by opening submissions and adding guides and informational videos. Technical and staff support for the creation and maintenance of open access journals was also increased. To promote open access to research and the preservation of institutional research output, creating or improving a functional institutional repository is recommended for inclusion in library services.

Digital Scholarship

As services supporting open education, open access, and the repository grew, it became clear that there was an emerging need for expanded services surrounding digital scholarship. Researchers needed assistance finding and using web hosting, content management systems (CMSs), and digital tools. After exploring options, DRS decided to implement web hosting through a platform called Domain of One's Own. Branded as UofSC Create Digital, this service provides researchers with access to

personalized domains and easy, one-click installations of popular CMS options such as WordPress and Omeka. With the implementation of UofSC Create Digital, librarians were able to offer workshops and consultations on the creation of digital projects using WordPress, Omeka, and Scalar. The use of a domain hosting service greatly simplified the development of digital scholarship services and may be useful for others growing digital scholarship or digital humanities offerings.

While scholarly communication services vary across libraries, knowledge of copyright, publishing, and research communication is required. Librarians preparing for a role in scholarly communication can expand their expertise by staying up to date with developments in the field, taking courses on copyright, licensing, and publishing, and by communicating with others in libraries and institutions to gain a fuller understanding of researcher needs.

Data Services

In recent years, funding agencies have increasingly required that the underlying data resulting from funded research be made available in public access repositories. Moreover, the increasing role of data in research has contributed to the rise of librarians offering services to help researchers at their institutions manage data (Federer, 2018). Because academic libraries have a long history of organizing data and preserving it for long term access, many have become involved in data management and curation. While some libraries offer research data management training and consultation services that closely align with traditional library roles (Tenopir et al., 2015), others offer data curation and, in some cases, long-term preservation of research data in an institutional repository (Hudson-Vitale et al., 2017). In a 2017 analysis of academic library website content, Yoon and Schultz found that research data services are becoming increasingly common.

Federer (2018) found that librarians offering research data services in academic libraries come from a wide array of educational backgrounds, and that not all have formal training in working with

data. This was the case at the University of South Carolina. In 2015, University Libraries at UofSC was not yet offering research data services. A reference librarian working as subject liaison to many of the science disciplines, with the support of library administration, offered to learn more about research data management concepts and conceived of a suite of services to meet campus needs. The librarian learned data management skills and concepts over time through networking, reading, conference attendance, and by completing a Graduate Academic Certificate in Digital Curation and Data Management from the University of North Texas, which provided a strong foundation in data management and digital preservation principles.

When beginning the process of creating these services, it became apparent that building relationships with key stakeholders would be an important and ongoing step. Flores, Brodeur, Daniels, Nicholls, and Turnator (2015) described the landscape of research data management services at the university level. They suggested collaborating with the institution's IT department, Office of Research, and, of course, with academic departments and individual faculty. Additionally, conversations with the Office of Sponsored Awards and Research Computing proved valuable in building data services at UofSC. These campus stakeholders can help promote fledgling services and, in some cases, provide funding for projects.

For libraries hoping to create research data management services, it may be useful to learn some initial steps that can be taken to get the program off the ground. The following are areas that libraries new to providing data services may wish to concentrate on.

1. **Data management plans.** DMPs are documents that lay out how research data will be collected, stored, and disseminated. These plans are part of the proposal process for many federal funders, including the National Science Foundation, National Institutes of Health, the Institute of Museum and Library Services, and others. DMP requirements vary by funder. Many libraries offer researchers help with these documents. Assistance with data management plans is often

the first Research Data Management (RDM) service offered by libraries (Lake et al., 2014). There are several likely reasons for this. While working with data management plans does require some understanding of concepts such as data storage and data sharing, high-level data skills are not required to help researchers plan and write these documents. Researchers are often unaware of resources to help them write their plans. For example, The DMPTool, available at https://dmptool.org, provides free DMP templates and guidance for many funding agencies. Researchers are often happy to have help from the library with this part of their grant proposals. Libraries wishing to offer help with data management plans can provide workshops and DMP review services.

2. **Data archiving/sharing**. Data management plans are generally required by funding agencies because they expect the data resulting from the research project to ultimately be shared, when appropriate, in a public access data repository. Though many colleges and universities do not have an institutional repository that accepts research data, there are many open repositories throughout the world that do. The Registry of Research Data Repositories, available at www.re3data.org, is a searchable tool that provides information about thousands of data repositories that librarians can use to help researchers find an appropriate home for their data.
3. **Finding data/data re-use.** Many researchers use existing datasets in their research. Because of funder data sharing requirements, open governmental data initiatives such as data.gov, and an increase in interest in open access and open science, there is a growing ecosystem of open, freely available data to use for research. Some data librarians help researchers find needed data for secondary analysis. Finding data can be difficult, and librarians planning to offer this service will benefit from having training in quantitative and qualitative data collection methods. However, many librarians who do not have this kind of skill set are, nevertheless, capable of helping researchers find data from a number of sources.

4. **Data management basics**. The research data management needs of faculty and student researchers vary widely by discipline (Akers and Doty, 2013). Having an understanding of the needs of the populations served by the library and of the basic principles and practices of data management can provide academic libraries a way to help researchers manage their data. There is a wealth of training on data management basics available online. Librarians hoping to learn more about data management may wish to visit DataOne's Research Data Management Education Modules, available at https://www.dataone.org/education-modules and MANTRA Research Data Management Training, available at http://datalib.edina.ac.uk/mantra/.

Departmental Programming

In a 2014 CNI report, Lippincott and Goldenberg-Hart listed the following as the most common services and activities performed at digital scholarship centers: consultations and workshops on digital technologies, digital preservation/curation, intellectual property, and digital project management (p. 5). These activities are staples of the programming provided by Digital Research Services at UofSC. DRS librarians perform consultations with faculty and students on an array of scholarly communication and data services concepts. Research support workshops are regularly held throughout the academic year and can be attended by anyone at the university. In addition to individual workshops, events are sometimes clustered around themed weeks, such as Open Access Week and Love Data Week. DRS librarians also create online guides using Springshare's LibGuides platform and record video tutorials, which are embedded into guides, shared with classes through the institution's content management system, and streamed via the library's YouTube channel.

Graduate students are a particularly important population for libraries providing digital scholarship services. Fong, Wang, White, and Tipton (2016) explained that graduate students need many research skills but have very busy schedules and "a variety of their information needs – both education-

related and career-related – might not all be met within a given graduate program's curriculum" (569). Indeed, graduate students make up a large percentage of the attendees at DRS events.

With this in mind and hoping to reap the benefits of the boot-camp-style graduate student workshop series, DRS began planning for this group. In August of 2019, a free day-long pilot program for graduate students and new faculty took place. Hour long sessions on open access, data management, data visualization, and other digital scholarship topics were offered. Feedback was generally positive, so a decision was made to expand the program.

Based on this initial experience, a two-day boot camp-style workshop series called the Skills, Habits, and Research Program for Graduate Students (SHARPGrads) took place in December of 2019. Running on a breakout session schedule, graduate students chose between two digital scholarship-related sessions each hour, including some discipline-specific content. A full schedule with program descriptions can be found on the program's site, available at https://guides.library.sc.edu/sharpgradspilot. A second iteration of SHARPGrads was planned for March of 2020 but was canceled because of COVID-19. Some of the planned content was delivered synchronously and asynchronously online. DRS prioritizes delivery of this type of content to graduate students and will offer it again when teaching in library spaces becomes possible.

Assessment and Next Steps

Assessment of DRS services includes tracking numbers of events and services provided each semester. Typically, the number of events hosted, number of participants, and number of consultations performed are counted. The percent change in the number of services over the previous year is calculated with the goal of an increase in services provided each year. Digital Research Services is still a young department, and a deeper evaluation of services will be necessary in the future.

As the DRS Librarians look forward, several goals guide decisions being made in the department. Next steps for Digital Scholarship services include:

1. **Bringing expertise to the library.** There are librarians and colleagues on campus who can extend expertise beyond current DRS services. DRS has begun the process of bringing in experts from outside of the department to teach desirable content.
2. **Building skill sets.** Each member of the DRS team strives to add skills that can be shared with others throughout the university. For example, though none of the current DRS librarians is an expert at text mining or web scraping, individuals are working to build those competencies.
3. **HathiTrust.** In the past year, University Libraries became a member of HathiTrust. As part of the membership, faculty and students can access the Research Center's tools for computational analysis of the HathiTrust corpus. DRS looks forward to sharing information about using the HathiTrust Research Center for text mining with the campus community.
4. **Classroom reach.** At the University of South Carolina, many graduate students take a 700-level research methods class. Classes like these are a natural fit for digital scholarship skills and concepts. DRS hopes to extend its presence in such courses, either during class time or asynchronously with guides and recorded content.
5. **Helping with the cost of research**. Doing research costs money, and many researchers seek funds to assist with this. Currently, DRS provides the SCoer Award for instructors making the move to Open Educational Resources and the Open Access Fund, which helps researchers pay Article Processing Charges associated with publishing in OA journals. Currently, there is also a pilot program for purchasing datasets needed for research or teaching. DRS will continue to look for additional opportunities to aid researchers with costs.

Lessons Learned

The development and creation of a new library service is a considerable task. From experience, the librarians involved in the implementation of the Digital Research Services department have compiled lessons and suggestions that may be useful to others undergoing similar processes.

1. **Hire thoughtfully.** The Libraries made the difficult decision to hire certain positions without the requirement of an MLIS or similar degree to offer better technical services. While this decision was appropriate for early departmental needs and led to the ability to offer valuable services, some candidates are ultimately better suited for work outside of Libraries. While any hiring decision is a risk, non-degreed professionals may be less invested in librarianship.
2. **Develop internal staff skills.** The Libraries also acknowledged the importance of recognizing internal potential growth. Many existing individuals held useful skills, and the Libraries invested in employee development. Library support and emphasis on internal development can allow personnel to offer new services without having to hire externally.
3. **Accept external help.** However, as the service grew, the department sensed the value of bringing in external support from campus experts. Many teaching faculty and campus specialists may be excited to share their knowledge and to invest in partnerships.
4. **Accept unexpected adjustments.** Finally, just as the DRS department was truly settling into its new role, COVID-19 became an unavoidable factor. The department was forced to transition into a completely virtual setting, derailing plans for workshops, consultations, and other programming. However, with the fast acceptance of new technologies and virtual teaching methods, the department was quickly and smoothly shifted to a new environment. Despite initial concerns, attendance increased during this period, and no services were lost in the transition. Even the most unexpected of adjustments can offer new opportunities.

Conclusion

Since the department's inception in early 2019, despite setbacks with staffing and the pandemic, librarians in Digital Research Services at the University of South Carolina Libraries continue to grow their skill sets and seek new opportunities to provide digital scholarship services. While the department is still in its early stages, anecdotal and statistical evidence suggests there is a real need for these services. It is the hope of the Digital Research Services departmental members that sharing this experience will assist other Libraries and library staff investing in building digital scholarship or data services.

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