

Audit of ULS Support for Digital Scholarship

Report of Findings and
Recommendations

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September, 2014

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“Pixel-sorted vertically then horizontally, comparing brightness, saturation and hue (in that order). Effectively a visualization of Monet's palette as seen by the digitization workflow, which ended with a JPEG image in Wikimedia's Creative Commons.”

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Executive Summary

The University Library System (ULS) at the University of Pittsburgh enjoys a good foundation of capabilities to support digital scholarship. It has worked hard to develop these capabilities over the last 15 years, including expertise in digitization, digital collections infrastructure, electronic publishing, and repository services. These capabilities, while highly successful from a production standpoint, have a more varied track record of success in terms of their engagement and visibility across campus and within the ULS itself. There are also substantial opportunities for broadening our portfolio of services in support of digital scholarship while at the same time bringing more visibility, consistency, and transparency to their workings.

Interviews with Pitt faculty working in various areas of digital scholarship show that the ULS, to the degree that those faculty members interact with it, is held in very high regard. However, many faculty members interviewed have little or no engagement with the ULS as they struggle to develop communities of practice, access resources and expertise, steward their projects and data, and provide opportunities for their students. All of these are areas in which the ULS can, and by tradition, *should* play a vital role of engagement, support, and fostering of community. In some areas, the ULS already has resources, expertise, or services that simply need to be better communicated. In some, like bibliometrics, the ULS is in the midst of developing services. In other areas, such as research data management, the ULS has little capability currently developed. In all cases, faculty and campus units interviewed for this project *wanted* the ULS to be more involved, and would welcome a greater level of engagement.

Within the ULS, existing capabilities to support digital scholarship are often thought of as “belonging” to departments or individuals rather than to the organization. To the extent that they are recognized as services, they are often considered internal operations or lacking clear procedure for handing project initiation and the allocation of resources. There is an encouraging degree of interest among ULS staff in developing new capabilities and services, but there is uncertainty about the supporting structures that will enable these to be shared broadly across the organization.

Many needs around digital scholarship that surfaced during this project require physical space as a resource in ways that are not currently met. At the same time, several under-recognized or under-utilized existing ULS services need a more visible front-end where they can be presented in-person, without the need to find a web page or know the right person with whom to schedule a meeting. In these respects, our current physical resources in support of digital scholarship are underdeveloped, but again there are opportunities in this area that the ULS can seize. Hillman Library, situated in the heart of the Oakland campus, is especially valuable in this regard, however many of the services in support of digital scholarship are currently based off-campus at the ULS’s Thomas Boulevard location.

At peer libraries, a similar picture emerges. Many research libraries are working to consolidate, extend, and re-brand digital scholarship services, but many find themselves facing the same challenges

described above: challenges of strategically identifying appropriate areas of focus, bringing cohesion and visibility to a suite of services and resources, finding the right uses of space and physical presence, and determining the right organizational structures so that digital scholarship is broadly supported as a core service component of the library.

This report details findings from interviews with Pitt faculty and key support staff, ULS colleagues, peer and libraries. It is supported by the work of the ULS Knowledge Commons project, which took place concurrently in spring of 2014, and in particular by a survey of faculty conducted by that group.

The report concludes with recommendations for the ULS. The recommendations are based upon the project's findings, and also attempt to address both the weaknesses and opportunities summarized above.

Project Background

In December of 2013, Rush Miller, the Director of the University Library System called for a project to conduct a "strategic audit" of ULS support for digital scholarship. The project charter is attached as *Appendix A*. The project was closely related to a strategic option presented by the FY14 ULS Planning and Budget Committee, and was also related to the concurrent work of the ULS Knowledge Commons project team, which met during the spring of 2014. Another related initiative within the ULS during the spring of 2014 was the development of a new long-range plan for the library covering the fiscal years 2014-2017; the new plan made several mentions of digital scholarship that align with this report's investigations, such as "advance the creation of new knowledge by providing innovative digital scholarship services and by helping researchers manage, analyze and re-use data."

This report, and the findings and recommendations it contains, represent the final deliverable of this project.

Methodology

Scope and Definitions Used

For the purposes of this project, "Digital Scholarship" was defined in an intentionally broad manner, to include the use of digital tools, data, methods, authoring, publishing, and stewardship to support teaching, research, and learning. This breadth allowed the project to cover a wide ground of observed and emerging activity (e.g., from Digital Humanities work to scientific data management and data visualization). It also reflects the library's position as a central resource at the University and its desire to cultivate relationships across the schools and disciplines that it serves. There were some services and activities that were out of scope for this project, as the charter notes: "although they are part of the ULS

portfolio of support for digital scholarship, the ULS E-journal publishing program and D-Scholarship, the institutional repository, will not be included in the audit of existing digital collections.”

There were three main parts to the project’s investigation: first, a series of interviews with selected Pitt faculty and representatives of services and centers; second, an examination of existing ULS services, resources, and organizational resources; and third, a series of interviews to learn about models of support for digital scholarship at peer research libraries.

Specific Methodologies

Although the project was labeled an “audit”, the methodologies used were less structured and less of a formal review than that term might suggest. Early formulations of the project included the idea that existing services and projects (e.g., existing digital repositories) would be audited in a quantitative way; however, as the project was underway it became clear that this was beyond the scope of work possible given the time available. It is recommended that such work be conducted as part of an ongoing evaluation of ULS resources; this recommendation can be found later in this report. In practice, an applied ethnographic methodology was used for the bulk of the project.ⁱⁱ The data are largely qualitative in nature, and were gathered using semi-structured interviews as the primary instrument.

Faculty Interviews

Faculty interviews were conducted using a schedule designed primarily to learn about faculty activity and to elicit information and ideas from their perspective. The interview schedule is attached as *Appendix B*. In all, eleven faculty and one member of an academic support staff were interviewed using this method. The faculty members interviewed were selected primarily on the basis of personal recommendations from ULS staff, and in particular from ULS Senior Staff and Liaison Librarians. Although some effort was made to cover the breadth of disciplines on campus and to include representation from the regional campuses, the sample of faculty is in no way intended to be representative of faculty at the University generally. In part, this is a reflection of the current state of digital scholarship activity at Pitt, which is not evenly distributed and is driven more by the interests of individuals than by top-down, school or University-wide initiatives.

All participating faculty agreed to have the interviews voice-recorded and the interview terms indicated attributions would be made anonymously unless separate agreements were made. The interviews were transcribed and analyzed to derive many of the findings in this report. Open and closed coding was performed using NVivo software, a tool for qualitative data analysis. In addition to the 12 formal interviews, several other less structured, un-recorded interviews and meetings were conducted and form background material for the findings.

Faculty interests, activity, and sentiments were also captured through a survey created and distributed by the Knowledge Commons Project group.

ULS and Peer Library Interviews

The internal review of ULS services and the gathering of information from peer libraries also used semi-structured interviews as the main method of inquiry. Interview schedules used in the ULS and with peers are attached as *Appendix C* and *Appendix D*, respectively. Six internal ULS groups representing service areas were interviewed, and four peer libraries were interviewed. Although these interviews were not audio-recorded, detailed interview notes including direct quotes were created during each session.

Additional Sources

Finally, throughout the course of the project, relevant articles, presentations, web sites, blog posts, and other resources were collected and reviewed as inputs into the findings and the recommendations. These have been shared using a public Zotero group library, and the citations are included in the report as *Appendix E*.ⁱⁱⁱ

Findings

Findings from Faculty Interviews

This section reports on the findings from interviews conducted with eleven faculty and one key support staff member for an academic center. For ease of reading and to protect anonymity of the participants, these twelve interviews are referred to as faculty interviews.

CHARACTERIZING THE FACULTY

The faculty members interviewed were specially selected because of their use of, or interest in digital technologies, computationally-supported investigation, or data-intensive research or teaching. As such, they are not necessarily broadly representative of faculty across the University. They do, however, exemplify a growth in modes of digital scholarship within higher education that has been observed elsewhere^{iv}, and many of them serve as highly-visible leaders within the Pitt community: often, the same names were mentioned when representatives of the project asked “who should I be talking to”.

Finding F1: Faculty have a positive view of the library and welcome ULS engagement in the area of digital scholarship.

The interviews conducted in this study pointed to ULS’s positive reputation on campus. One interview participant described ULS as the leading – and, even, primary – force in facilitating collaboration at the University of Pittsburgh. Moreover, faculty view ULS as having a natural role in supporting digital scholarship on campus. Every faculty member interviewed suggested some aspect of support for digital

scholarship for which they considered the ULS an obvious and legitimate partner. One faculty member remarked, “I’m just excited that you all are asking these questions. I want Pitt – I think we all want Pitt to be even more exciting and interesting... So I’m excited that the library is becoming a partner in all of this.”^v The ULS is welcomed and seen as a critical contributor to research and teaching involving digital tools and media.

Finding F2: There are great variances among faculty needs on campus.

While all semi-structured interviews with faculty were guided by the same interview schedule, the conversations took different paths and revealed distinct needs and concerns dependent on disciplines. At the School of Engineering, the discussion was almost entirely focused on data management needs and challenges that colleagues confront. The emphasis was on having the capability for storing datasets in a centralized repository and receiving assistance in writing data management plans. This interview contrasted sharply with one conducted with a professor in the School of Arts and Sciences, whose interview focused less on research data management and more on equipment challenges.^{vi}

Finding F3: There are gaps in faculty members’ awareness of existing services, resources, and training available through the ULS and other entities within the University of Pittsburgh.

Even when a service or resource is available on campus, faculty and their students are not always aware of it. One faculty member, for example, expressed interest in depositing his publications in an institutional repository but was unsure where or how to do this. When the project director informed him of the existing services available through the ULS, the faculty member indicated that he would consider reaching out to the appropriate staff for assistance.^{vii} Another remarked that his students would benefit from an on-campus large-format printing service, evidently unfamiliar with CIDDE’s work in this area.^{viii} And another, when told about the ULS’s support for altmetrics services, replied, “Boy, that’s awesome. It hadn’t even occurred to me that the library could support that. That would be amazing.”^{ix} As one faculty member noted, this lack of awareness is likely the result of “information overload.”^x

Finding F4: Faculty are working, and sometimes struggling, to build communities of practice in the area of digital scholarship.

There is, as one faculty member described it, a need to “corral” the individuals – both faculty and students – who are engaged in digital scholarship at the University of Pittsburgh. The need is particularly strong amongst those working with technology in the humanities. The DHRX, a Digital Humanities research group at Pitt, is one visible example of a community-building effort. One DHRX member explained, “[M]ainly we’re trying to get some people in Arts & Sciences over to the iSchool. To ... try to collect enough people from A&S who are becoming more focused on the digital humanities because

they're not being corralled. They're not being corralled pretty much anywhere, but definitely not being corralled at Pitt."^{xi}

A similar sentiment was expressed by a faculty member from the Sciences: "Nobody comes to us and says 'Hey, let's do a project together.' We have to go to them and say 'Hey, look at what we do, we can do a project together.' The same way that the astronomers are there, they're doing their stuff. Can we facilitate the connection between them? So I'm talking to the provost because I think that we're missing out on a lot of opportunities because people are working in silos"^{xii}.

Faculty are interested in building new communities of practice for themselves and for their students around aspects of digital scholarship, as well as expanding existing networks like the DHRX. In general, they welcome the support of the ULS in facilitating the development of these communities of practice.

Finding F5: Among faculty, there are differing opinions about what researchers engaged in digital scholarship projects should be able to do for themselves and what can be done for them (or by collaborators).

Several faculty interviewed disagreed on the degree to which researchers engaged in digital scholarship should be capable of performing all technical methods themselves (e.g., writing their own code) as opposed to outsourcing or relying on partners for such aspects of their work. This disparity has implications for the research library's role. This disagreement was observed most strongly amongst humanities faculty, and in relation to Digital Humanities work in particular; one faculty member explained her position as follows:

I am often slightly outspoken about my belief that DH practice belongs in the faculty and not in the libraries and I might take this as a point to say on tape. That the issue, of course, again, is not that 'the libraries have nothing to add to this conversation,' it's just that they're not the technical service providers for the academic's 'big thoughts'... Being the training support infrastructure for students and perhaps faculty to bone up on cutting edge, current skills is a different thing then being the person who says 'well in order to answer that question the methodology goes like this'. I think that's the proper collaboration here."^{xiii}

The same faculty member stressed that a research team should be composed of individuals who each have both academic knowledge *and* the capability to do technical work. It should not be the case, she argued, that there is extreme imbalance in skillset and domain expertise."^{xiv}

Another faculty member, representing an opposing perspective, suggested that this "model of researchers who are also coders" excludes many researchers. He remarked,

Maybe this may be more elitist than I mean it, but I sort of feel like coding is kind of a commodity and it's not really the thing that research faculty are hired to do or evaluated on. And so if that's true, I can write grants for people to do those things for me and that's an existing model and that's fair too....[Y]ou shouldn't have to develop a whole skill set that other people have and can do more efficiently. That's not a very efficient approach.^{xv}

Striking a balance between these two ways of thinking will be a delicate and likely evolving consideration for the ULS.

Finding F6: There is strong interest among iSchool faculty and administration in partnering with the ULS to support and investigate digital scholarship.

The faculty audit included two formal interviews with iSchool faculty and additional informal discussions with iSchool faculty and administrators. From the iSchool side, there is a shared interest in raising awareness on campus about digital scholarship that is happening in the iSchool.^{xvi} Several faculty in the iSchool have expertise, and/or perform instruction in areas that are closely aligned with emerging research library services, such as digital stewardship, research data management, geospatial analysis, and innovations in scholarly communication. In addition, members of the iSchool community have signaled their commitment to providing support as the ULS builds upon existing digital scholarship services and resources.

TOOLS FOR TEACHING AND RESEARCH

Finding F7: Faculty use a wide variety of software to assist them in their research. For their teaching, faculty are concerned about ensuring that their students have ready access to the software and, consequently, prefer open-source tools.

There were a variety of software and hardware tools that faculty described using in their own research and teaching. These ranged from software packages that are commonly found on most any computer to much more specialized tools (*Table 1*). This is not an exhaustive list, and is not intended to represent faculty needs across the University, but is presented here as context to display the variety of tools in use.

Table 1: Software currently used (multiple mentions starred)
Adobe Creative Suite * <i>still and moving image creation and editing</i>
ArcGIS * <i>geospatial data creation and analysis</i>
Avid and Final Cut Pro * <i>digital media editing software</i>
Avogadro and Open Babel <i>open-source chemistry software</i>
Bitbucket and GitHub * <i>collaborative source control management</i>
Box and Dropbox * <i>cloud-based personal and collaborative storage</i>
Endnote and Evernote <i>citation management and storage</i>
Collective Access <i>open source collections management system</i>
Cytoscape <i>network visualization</i>
eXist <i>open source XML database</i>
iBooks Author <i>e-book creation</i>
Juxta and Versioning Machine <i>text analysis tools</i>
Microsoft Office (Word and Excel) * <i>document and spreadsheet creation</i>
oXygen XML Editor <i>XML document creation and editing</i>
R <i>statistical analysis</i>
SketchUp <i>3D modeling software</i>
Weka <i>data mining toolkit</i>
Wing IDE <i>Python editor and development environment</i>

In many cases, faculty teach using the same tools they use for their own research. In these cases, faculty want their students to be able to easily access the software necessary for completing course assignments on their personal devices. This, along with personal convictions concerning the value of open source, often motivate faculty to use or recommend open-source or otherwise free software.

Examples of tools of interest are identified in Table 2. There were faculty who are not currently using certain tools highlighted in Table 1, but who are interested in experimenting with them (GitHub and ArcGIS appear again here for that reason). Moreover, faculty are also interested in experimenting with tools that they observe being used by peers in their disciplines. A small number of faculty made

reference to the value of the University's Lynda.com license for helping them, and their students, learn unfamiliar software and tools.

Table 2: Software of interest for future use
Alternatives to Adobe Creative Suite <i>still and moving image creation and editing</i>
ArcGIS <i>geospatial data creation and analysis</i>
Gephi <i>network visualization</i>
GitHub <i>collaborative source control management</i>
Isadora <i>real-time media manipulation</i>
Max/MSP <i>interactive sound and video design</i>
Midas Platform <i>web-enabled collaborative data storage</i>
Project management tools
Qualitative coding software

SUPPORT FOR THEIR STUDENTS

Finding F8: Faculty feel their students need improved access to facilities, hardware and equipment for research and coursework, and experimentation

As *Findings F12* and *F13* below speak to, faculty identified limitations with the existing lab space on campus. They also pointed to the need for both greater access to portable equipment or assistance with managing a lending program for this hardware. CIDDE (Center for Instructional Development and Distance Education) was sometimes mentioned in relation to equipment rental, but their policy of only lending equipment to faculty for classroom instruction^{xvii} was considered too limiting, and faculty responded by finding other, unsatisfying, alternatives. For example, one faculty member discussed his practice of lending his personal digital recorder to his doctoral students and said he was unaware of any centers on campus that makes equipment like this available to Pitt students.^{xviii} Out of necessity, another faculty member has developed a library of digital cameras and LCD projectors for his students, but finds it challenging to administer a lending program for these devices.

Play and its potential value to digital scholarship was a theme that emerged in discussions with faculty. One faculty member remarked, “You know those ‘tech petting zoos’ that some libraries have? I would love if there was an academic library version here at ULS. I think there’s tools we already have and infrastructure we already haven’t gotten to pet with it in a safe way and that they’re not using but they could be using.”^{xix} A studio arts faculty member stated that he felt “a little bit trapped” by Adobe

Creative Suite, which is available in his departmental lab and CSSD computing locations, and is interested in tools that his collaborators are using for digital media creation and editing. He explained, “Those are things that I almost see as unnecessary for installing on every machine. If you have something like a dedicated media lab or something like that and you had some machines that had those on there, it would be cool because I could give some of my students to play with those things.”^{xx} Several faculty expressed interest in 3D printing, but with some equally skeptical about its value.

Finding F9: Faculty would like more opportunities for engagement with digital scholarship made available to their students

The previous finding addressed resources students might use when creating digital scholarship. Faculty interviewed also identified a number of different ways in which infrastructure supporting their students’ *engagement* with and *sharing of* digital scholarship was underdeveloped, citing a lack of work placement opportunities, advanced coursework, availability of tools and trainings, and spaces for sharing their work.

Faculty indicated that currently, students interested in further developing their engagement with digital scholarship often work with a faculty member on a faculty research project. This requires that students insert themselves into a community of practice, locating faculty mentors on a campus where digital scholarship has spotty visibility. There may be students who do not realize their ambitions because they are not based in a department where there is coursework or work opportunities.

MODELS FOR TRAINING

Finding F10: For themselves, faculty question the efficacy of existing models for technology trainings.

Faculty expressed varying opinions as to the usefulness of training sessions around technology, with some indicating they had little to no personal interest in attending such sessions. However, among those faculty who did express an interest in trainings, there were several conversations about the drawbacks of conventional, tutorial-based workshops. Not only are workshops often poorly attended, but more importantly conventional trainings do little to communicate the ways that tools are applicable to research and teaching. One faculty member, who has herself led tutorials on Cytoscape (a network visualization tool) at Pitt, shared, “[L]et me tell you what happens when I run those sessions, because I did the first few times I was here: nobody comes. They want to come. Then something more interesting happens than sitting down and learning Cytoscape. Do I blame them? No. Because the only time people really use tools like that is when it serves them. It’s something they need to do when it’s a barrier to getting whatever they need to have solved, solved.”^{xxi}

Another faculty member corroborated this from the perspective of a workshop attendee. He noted, “I had never sat through a training that was at all useful. Like sitting in a room and having someone tell me to click on a drop-down menu and select...The way people learn how to use software is by having a need and trying to use the software to address the need.”^{xxii} Faculty members suggested potentially more effective ways to designing technology sessions, for example having a researcher share how he or she used a tool to help address a research question.^{xxiii}

Finding F11: For their students, faculty do not want to play the role of technology trainers. They welcome the ability to refer students to support provided by others.

Faculty often noted it would be useful to be able to point their students to individuals who could give assistance with tools used in the classroom, or who could provide learning support for a set of “new, hot” tools used digital scholarship – especially those that the faculty member may not have had time or need to learn his or herself.^{xxiv} Faculty want their students to be able to connect with staff who can serve as a “human knowledge base” for technologies that the faculty would prefer not spend time overviewing during class sessions.^{xxv} In discussing a model for trainings or workshops, there were instances in which the faculty were not aware of existing services trainings the ULS provides (citation management trainings, for example) or the Lynda trainings now available through CSSD.^{xxvi}

CHALLENGES WITH LAB SPACE AND COMPUTING RESOURCES

Finding F12: For faculty who rely on digital tools for their teaching, the CSSD labs are important resources. However, they encounter limitations around software and availability in using these spaces.

There are labs at the University of Pittsburgh that currently support digital modes of research, teaching, and learning. These include the Computing Services & Systems Development (CSSD) labs and the three CSSD-run “collaborative team rooms” in Alumni Hall. There is uniformity in the software that CSSD makes available on the Mac, Windows, and Linux machines in the campus computing centers, with a codified process for faculty to submit requests for the installation of additional software.^{xxvii} One faculty member who relies on the CSSD labs to support his teaching expressed frustration with the approval and installation process for new software. He recounted an instance in which he requested that CSSD install a software package so that students could access it for his course. He was informed that there was software with the same functionality already available. The faculty knew of the availability of this software and had reasons to want his students to use a different package. Ultimately he decided to drop his request in light of the resistance he met.^{xxviii}

This faculty member was not alone in his dissatisfaction with the software available on the CSSD machines. Another said that the computer policies limited what she was capable of teaching to her

students. She explained, “For a lot of the open source stuff you had to have admin privileges to even *run* the software. So there are plenty of things for [the course topic] that I can’t teach them on those machines and it proved frustrating.”^{xxix} It was necessary for the faculty member in this case to design her course with these restrictions in mind.

In addition to software concerns in the CSSD labs, there was discussion surrounding vying for space. Faculty who wish to use the CSSD labs for teaching submit a reservation. One faculty member described the reservation process as a source of anxiety for him. “The lab reservations are always a stress for me because I try to be the first one in and usually I am, but they don’t have a particular deadline and procedures are complicated, so although I’ve never not been able to get a lab, I’ve been anxious about it.”^{xxx}

Finding F13: There are labs that are connected to departments and faculty on campus where students can create digital projects. They are not, however, open to the campus-wide community.

Aside from the CSSD computing labs, which are a campus-wide resource, there are labs supporting digital scholarship and teaching that are attached to a specific faculty member or department. Two such examples are located in the Frick Fine Arts Building and are connected to the Department of Studio Arts and the Department of the History of Art and Architecture. In the case of the studio arts lab, one of the interviewed faculty members has made a concerted effort to provide the equipment that his students need for their courses and to engage in digital media creation. While the faculty member was pleased with the amount of equipment in the lab, his students have expressed interest in being able to use the library for their work: “If students live next to another library and it’s convenient and they can work there and not have to come in, that would be amazing.”^{xxxi} The second lab space in Frick Fine Arts is the Visual Media Workshop (VMW). It is a teaching and learning lab where the Director also engages in her own research. It is neither equipped nor intended to serve as a campus-wide digital humanities center.

While the creation of departmental labs can act as a partial solution to the challenges that faculty face in using the CSSD labs, there are drawbacks and limitations here as well. “Departmental resources,” as one faculty interviewee aptly noted, “are tight.” Moreover, he described an uneven pattern of use, with heavy traffic during only three or four weeks of the term.^{xxxii} While a segment of the campus community can benefit from the resources and capabilities that these spaces provide, departmental and faculty labs are not for universal use on campus. Instead, they are available to the faculty members’ students or to the students in the department.

Finding F14: Many faculty members are dissatisfied with their personal department web pages, and with server space and administration requirements for CSSD-hosted servers

A number of faculty identified server insufficiencies as a constraint, noting that they would like greater flexibility and space for sharing resources and projects and for installing software. For faculty who use CSSD-hosted server space for their digital scholarship projects, the work this involves is cumbersome. One faculty member remarked, “I was just granted another server up at the NOC [Network Operations Center] to run [a project] off of in the summer, I have to do all of the IT work. Then I have to run that server which is a giant pain and not really in my job description.”^{xxxiii} Another said of the administration of the server “I’d love to get rid of that responsibility.”^{xxxiv} For faculty, servers can have implications for teaching. One faculty member described a course that he offered in the past and remarked, “I didn’t teach it here because of the access to the internet and the server space stuff...but that would be an excellent thing to work on and teach.”^{xxxv}

SUPPORT FOR RESEARCH DATA MANAGEMENT

Finding F15: Faculty are challenged by the growing requirements to include data management plans with grant applications

Faculty interviewed tended to have a good understanding of data management plans, but many suggested that there is limited understanding among their faculty colleagues as to what constitutes good data practices and a good data management plan. One interviewee observed, “I’ve seen some of their data management plans and it’s kind of like, ‘yeah, we back things up’...I think it would be a tremendous resource for our department and anyone else NSF sponsored to say like, there are resources at Pitt we plug into.”^{xxxvi} Another faculty member said that he has encountered misconceptions among faculty that could have negative implications for their data in the future. He remarked, “There is a general lack of awareness the [stewardship] issues here. And there’s this widespread thought that ... if it’s digital it lasts forever.” One faculty member said she looked for boilerplate language for inclusion in a required data management plan and was disappointed that she was unable to find this type of resource. “I was sad when it wasn’t there for me last time. But I had to make it up, and I am informed, but I did make it up!”^{xxxvii} There is, certainly, both an opportunity and a need on campus for education and resources in the area of stewardship of data.

Finding F16: For faculty in certain areas of the University, there is interest in a centralized repository for datasets and support for long-term data storage

Some of the discussions with faculty were heavily focused on data management challenges and needs. One participant recalled previous conversations with CSSD about the possibility of having a centralized repository to deposit data and pointed to peer institutions where this is available to faculty: “[Y]ou know

when you look at the big publics across the country -- Stanford, Oregon, even privates like Northwestern, Michigan, Chicago - they all have some sort of a centralized repository..."^{xxxviii} Another faculty member described the availability of Box through the University of Pittsburgh, but questioned the usefulness of this storage space for long-term preservation of data. He made reference to the NSF requirement, remarking, "It's not clear that you can count on things like Box, right? What if the company folds for example?" For two years, this particular faculty member has communicated his concerns about data stewardship to senior administration at the University and put forth Stanford University as an exemplar in this area.^{xxxix}

A faculty member, who expressed a commitment to Open Access ideals, described his use of personal servers to manage his projects and data. While this is meeting his needs for now, this practice will not ensure his data may be shared in the long term. He noted, "When I go, so goes my server. It needs an institutional home."^{xl} The curatorial aspects of managing digital scholarship projects are discussed further in *Finding F18*.

Finding F17: Faculty are interested in the ULS providing data management resources and trainings

Faculty welcome library services in the area of data management and view such support as a benefit to themselves and to their students. One faculty member characterized the conversation that currently surrounds data management at the University of Pittsburgh as ineffective and overly concerned with compliance. He encouraged the ULS and its digital scholarship initiatives to be a player in changing this tone.^{xli}

There is an obvious connection between the growing number of granting agencies that require data management plans and the interest in such services. For doctoral students, one interviewee perceived the ability to write a strong data management plan as an essential skill that must be acquired by the completion of their program; they will, inevitably need to create one during their careers. ^{xlii}

STEWARDSHIP OF DIGITAL PROJECTS

Finding F18: Faculty are interested in the ULS providing long-term stewardship for their digital scholarship, and in consulting with ULS staff about metadata creation and preservation

The interviewed faculty had a working knowledge of preserving the products of their research and teaching that was perhaps higher than average among their faculty peers. Still, they recognized that they and their colleagues need help in this area. Faculty expressed an interest in stewardship support from the ULS, seeing it as a natural extension of the library's role. One faculty member explained, "Stewarding resources is a traditional library function and it's not something unfunded or even funded

projects can pay for, especially in perpetuity. If it's not part of the library's mission then I'm not sure where they'll go."^{xliii} Beyond storage, faculty members recognized the significance of other aspects of stewardship, such as metadata support. While personally adept at metadata creation, one faculty member still identified consultations about metadata, particularly for long-term discovery and interoperability, as of interest to him.^{xliv}

RAISING THE VISIBILITY OF DIGITAL SCHOLARSHIP AND ASSOCIATED ACTIVITIES

Finding F19: There is a need for appropriate spaces for faculty and students to meet to discuss collaborative digital scholarship

One way that faculty build community (*Finding F4*) is by meeting together, in person, to share information, network, and socialize. The faculty interviews revealed a need for neutral and appropriately-appointed spaces on campus to host such events. Out of necessity, the faculty members who are part of the Digital Humanities Research at Pitt group (the DHRX) utilize the previously described Visual Media Workshop for a meeting space. One DHRX member described the value of being able to meet together to discuss their engagement with digital scholarship projects, but said that the group is "totally using it [the VMW] as a clubhouse because we don't have another place to go. One potential logical place is something at ULS."^{xlv} The ULS, as a neutral space that is detached from an individual or a department, would be to the benefit of the DHRX and the broader campus community. A meeting space at Hillman would potentially attract not only the cross-departmental groups but also individual project teams scattered across campuses. Moreover, such a space may mobilize the creation of additional campus groups akin to the DHRX, thereby supporting the growth of digital scholarship on campus.

Finding F20: There is a need for centralized spaces available on campus where faculty and students can exhibit the products of their digital scholarship

Another space-related need emerging from the interviews was for locations where faculty and students can exhibit digital projects by, for example, connecting their personal devices to a large monitor or screen to share work with a research team.

Faculty across a range of disciplines viewed such an exhibition space as having value in raising the profile of digital scholarship on campus and to visitors to the University of Pittsburgh. One interviewee noted, "It could be a really visually exciting part of the library and also showcase all of this scholarship and creativity that's hidden...I think it could be really cool. And that could be tied to a place for readings or presentations."^{xlvi} However, faculty indicated such a facility would be most valuable for cross-departmental gatherings or special events, rather than for everyday work:

That would be useful if I were with a group of ten people coming from six different places that we'd gather somewhere then we should go there. But if it is a grad student showing me some results, we're not going to go to someplace where there is a wall ... Because it's a question of time. If I want to see some results that will take twenty minutes for the grad student to show me or forty minutes, I'm not walking ten minutes to instead of forty make the meeting thirty. It makes no sense.^{xlvii}

Finding F21: Faculty value infrastructure supporting digital scholarship to attract resources and top students and faculty

One faculty member discussed his frequent use of language related to Pitt's technology infrastructure on campus in grant applications and in doctoral student recruitment efforts. While his research does not require the use of the Supercomputing Center, for example, he makes reference to it in his grant applications and communications with prospective advisees. He expressed that it is critical to have such an infrastructure in order to attract the funding and students he desires. The ULS's initiatives in the area of digital scholarship would likely provide similar value to this faculty member and others by strengthening the existing infrastructure for innovation at Pitt.

This same faculty member chaired a faculty search this year and noted that the visibility of digital scholarship activity was a concern during the recruiting process. "People want to know," he said, "coming to work at schools like ours, 'where are the folks making digital media?'" For faculty candidate visits, and particularly those in departments without their own lab facilities, it would be advantageous for a digital scholarship lab to exist in a place that serves as a collective resource for all members of the Pitt community: the library.

Findings from Internal ULS Review

Note: the term "staff" is used generically in this section to refer generally to employees of the ULS and is inclusive of a variety of titles and positions.

Finding U1: The ULS is strong in many areas of digital scholarship support

Conversations with internal ULS groups working on digital scholarship services make clear that an abundance of strengths are already in place. The ULS has developed an impressive set of core capabilities and supporting infrastructure, as well as a set of positive working relationships with researchers, scholars, and partnership organizations at Pitt and around the world. Strong existing service areas include digitization, metadata expertise, digital repository management, electronic publishing, support for scholarly communications issues, and advocacy around Open Access. Developing initiatives include bibliometric and altmetric services, support for researcher IDs, and researcher profiling and automated deposit. In many of these areas -- though not all -- there is also a well-developed framework

of policies, documented procedures, communication mechanisms, training, outreach, and consideration for sustainability and ongoing management.

The ULS should be proud of these existing capabilities and should draw upon existing expertise and lessons already learned when designing new services and growing our capabilities.

Finding U2: ULS staff are often unaware of existing services supporting digital scholarship or don't have adequate understanding of how they function and who is responsible

As strong as these existing services are, there is a perceivable gap in awareness of them across the ULS. In some cases, capabilities are known, but thought of less as external-facing services and more as internal library operations. One Liaison Librarian commented, describing digitization and digital publishing, “I don’t think of them as services. I think of services as things as thing that users directly engage with. I think of these things as more for the library.”^{xlviii} And even when services are recognized as available to those outside the library, there is a frequently a lack of clarity about whom to contact and what the service entails. This can result in a hesitancy to refer potential partners and users to a ULS service. Another Liaison Librarian said, “I’ve been referring people, sometimes not knowing whether it is Tim, or [Aaron]... I never know what to... I don’t want to commit Aaron to anything. I’m always referring more than getting answers.”^{xlix} Another said, “It’s hard to see what the vision is for the digital universe of the University of Pittsburgh. I see things get priority but I don’t see what the priority is. It’s hard to know how to you get your material digitized.”^l

Finding U3: ULS staff generally, and Liaison Librarians in particular, are key to promoting, representing, and referring users to digital scholarship services, but service owners feel this role is under-developed

On the other side of this relationship, the service owners around digital scholarship repeatedly identified the importance of ULS staff, and Liaison Librarians in particular, in communicating services and engaging users and partners. However, service owners sense that Liaisons and ULS staff don’t have a clear enough understanding of existing capabilities and aren’t doing enough engagement on behalf of their services. One group talked about their interest in making presentations to departments around campus: “We haven’t gotten that many invites through Liaisons. Three. We should be getting more that way. [...] We need more help from the Liaisons; for some reason there’s some trepidation [on their part] that they’re not going to get the message exactly right, so...”^{li} Another service group had created a departmental goal for the coming year to work on this issue. The goal involved “being better at informing internal ULS people, that have contacts outside, what the actual capabilities are so that they know what to listen for when talking with faculty or other candidates for the services. There are too many people that don’t actually know what we do.”^{lii} But service owners recognized the already stretched capacity of many liaison librarians, which will be discussed below. One group reflected, “I do

have a sense that there's not that much more we can ask Liaisons to do because I think they're overwhelmed."^{liii}

Finding U4: ULS staff feel services and resources are not visible or known well enough outside of the library. ULS staff possess expertise and conduct training in a variety of areas that are not visible or do not have a consolidated presence.

The previous findings concerned the internal awareness of services and resources within the ULS. When it came to external awareness of services and resources (including locally-hosted digital collections), all groups interviewed expressed concern that these were not visible or known well enough outside the ULS. In many cases this centered on how services were utilized and how projects were initiated. Concerning digitization, a service owner said, "We don't have an inventory of services. I don't think people are aware of what we're capable of unless they come meet with us and ask. [...] There are a very small number of people at Pitt who know we can scan things, and they know they could ask for things to be scanned. So some work comes in that way, but it's not been very much so far."^{liv} Another group said of their services, "We haven't done as much as we need to do in terms of marketing and promotion. That would help. It's mostly word of mouth."^{lv}

Along with the visibility of services, several groups commented on the need to improve the visibility of ULS resources, in particular locally-hosted digital collections. A librarian noted, "There's a visibility problem with some of our digital collections, so you don't have to serendipitously get to something via PittCat search."^{lvi} A service owner identified a need for expertise and supporting technical mechanisms to increase the visibility of our content: "We don't know nearly enough about SEO; we need more expertise there. We need consulting, more training, carve out time to make sure that the content we're working so hard on is getting discovered in the right way."^{lvii}

In questioning ULS groups about their existing support around digital scholarship (*Finding U1*), it also became clear that there is a large amount of existing expertise that has low visibility, both inside and outside the organization. Groups often reported conducting personalized information sessions with individuals or departments, but these potential trainings and workshops are not listed in a consolidated way, for example, in the "Classes, Workshops, and Tours" section of the ULS web site.^{lviii}

Finding U5: ULS staff identified areas of opportunity around research data management, digital preservation, and bibliometrics services

While there were many areas of opportunity that were mentioned in conversations with ULS groups, three areas were mentioned multiple times by different groups, and there seems to be a cross-organizational consensus that there are areas of need and of strategic importance to the library. Those areas are research data management, digital preservation/curation, and bibliometric services.

Support for data management was the most frequently mentioned opportunity. ULS staff identified needs in several phases of the research lifecycle, from identifying and acquiring data, to describing it, and finally storing it, licensing it, and making it available for re-use. A group member observed, “There’s plenty of opportunities surrounding metadata related to research data. [...] There are DH scholars who need access to data through the library that has nothing to do with our digital collections.”^{lix} In another conversation, data was considered in the broader context of ULS advocacy for Open Access: “Open data -- it would be nice to have a service for the faculty, a place to put their data, where it’s licensed and it’s available for other people to use.”^{lx}

But a common refrain, covered in more detail below, was the lack of organizational capacity. This quote is a representative example: “It would be nice having someone who was more comfortable [talking about RDM]. It’s hard if there’s not someone locally who’s an expert who you can call on. I try to learn more, but I’m worried about getting in over my head.”^{lxi}

Concerning digital preservation, one group said, “We could use more expertise around digital preservation -- it’s one of those things where we know what we need to do, but we don’t know how, or don’t have time to do it right now. We can’t implement it given current resources.”^{lxii} In another conversation, a group member said, “I have a concern about format migration for some of the things that we have in our archives. Not that we have time with our current resources. It would be nice to explore the NARA trusted repositories, for example. We’ve never taken it upon ourselves to say what would we have to do to meet this standard, is it worth it to invest in it?”^{lxiii}

Bibliometric services were mentioned in several conversations. These included detailed descriptions of work already underway to explore the landscape for potential bibliometric services at the University, to purchase a source of researcher activity data feeds (Symplectic), and the utility such a service would have in relation to other publishing and repository initiatives.^{lxiv} It was clear that a ULS-hosted presentation this spring on bibliometrics services at other universities had a significant impact; examples of those specific service models were mentioned several times as ideals. In addition to bibliometric services, the ULS’s existing work on altmetrics with Plum Analytics and its forthcoming expansion was mentioned several times as well.

Finding U6: ULS staff are excited by the prospect of increased collaboration with faculty, but are aware of challenges

ULS staff, and Liaison Librarians in particular, showed excitement at the prospect of working in more collaborative relationships with faculty. One Liaison brought up the example of a colleague at another library: “I’d love to see projects that the library is collaborating on. Someone at the Law Library got a Masters in GIS and is collaborating with a faculty member. Papers that come out of this show that the librarian is a collaborator.”^{lxv}

However, echoing some findings from the conversations with faculty, ULS staff also expressed concern if they are not able to bring a certain status or credibility to their side of the relationship. In this case status might come from having domain knowledge, or from being producers of scholarship themselves, as this quote captures: “In our current structure, subject familiarity is key. It’s hard to see faculty taking us as serious as we want if you don’t know the discipline. That’s an area that plays an important part -- a person who can talk as an authority, who can carry weight. If Liaisons can produce scholarship in their own right, it can allow for collaborations that don’t currently exist.”^{lxvi}

Staff also identified the library’s valuable position as a neutral site on campus, and noted how that might support connections with and between faculty members: “I dream of library being a cross-disciplinary place. We provide a view, and can help with those connections. Wine and Cheese [event] is a nice first step, but there’s a lot more that we can do and data is one of the areas that we could do that might be successful.”^{lxvii}

Finding U7: ULS staff are interested in increased participation and partnership with external resources and initiatives

Along with partnership and collaborations across campus, ULS staff expressed interest in greater participation in several external projects and initiatives related to digital scholarship. These ranged from disciplinary data repositories (“It’s driven me crazy for years that we’re not more involved in ICPSR.”) to collaborative digital library projects (“Hathi Trust is an important partnership, but we’re not doing much -- we just don’t have the time -- there’s so much that we could be doing there but we’re not”).^{lxviii}

Finding U8: Staff point to a lack of capacity, in several categories, as hindering the development of needed new services and expertise

When ULS staff discussed areas of opportunity or capabilities they felt were under-developed, they often mentioned a lack of organizational capacity as the reason why the initiatives hadn’t or wouldn’t be accomplished. The lack of capacity identified took several forms: lack of time, lack of organizational commitment, lack of space amongst other responsibilities, lack of existing expertise, a lack of support staff, and the lack of coordination of existing expertise across the organization. Several of those categories come together in this comment about GIS: “Our GIS services are haphazardly supported. It’s hard work, hard to do. But we could have a service desk, make appointments. We don’t have all the software, but there are programs that we do. But not just one of 10 things that people do. The ULS has to make a commitment that that’s something we want. If we did it better, we could promote it, not just to the groups that already use it but to the whole campus.”^{lxix}

The lack of time and ability to take on new responsibilities was particularly strong amongst Liaison Librarians, who made several comments such as these:^{lxx}

- *“We stretched so thin. There are people dealing with multiple disciplines, I think that’s impossible.”*
- *“There has never been the ability to catch our breath to learn, if we’re not familiar with the area, what the subject really is.”*
- *“We just don’t have the capacity for [supporting research data management]. People are interested. But I don’t think we can do one more thing.”*

Staff (particularly staff with strong technical expertise) represent another dimension of capacity that came up in several conversations. In a conversation about the prospects of data management, a group member observed, “It’s using the most expensive kind of resource that you have, which is a person who has the deep technical expertise, and is also able to speak in the parlance of the researcher and meet them in their own terms. You’re not going to find many people like that and when you do they’re very expensive. If we’re to do this well, do we need a dozen people like that? Six? One thing I know -- we don’t have anyone in on staff, anywhere in the ULS that can do this [data management] work today.”^{lxxi} In another conversation about prospective new services, one group member said, “All of these things are very IT-resource dependent. Not only do we need to increase the IT resources, we need to better coordinate how they are applied across initiatives.”^{lxxii} And another conversation picked up on the need for coordination across ULS departmental boundaries: “If I wanted to do a project that requires resources from other departments, it can be tough, because for whatever reason it’s looked at as ‘a [ULS department name] project -- not my problem’ - for whatever reason.”^{lxxiii}

Findings from Peer Institutions

Finding P1: Peers consider digital scholarship to be an emerging area, and they do not feel settled into their supporting services or spaces

At peer organizations, support for digital scholarship is emerging and evolving; they do not view the digital scholarship services, spaces and the tools that they make available to the campus community as being in a fixed state. Peers make use of many models for digital scholarship support, and their digital scholarship initiatives are both externally and internally focused. Staff at one peer institution characterized digital scholarship as “an outreach effort within the library” and remarked, “We are developing things for scholars, but also uncovering unmet needs within the library.”^{lxxiv} In this model, the library staff are continuously assessing and addressing needs among faculty but also among their library colleagues.

The interviews pointed to evolving self-identities, maturing capabilities, and changing portfolios of services. Peers acknowledged that there are marked differences among libraries in what digital scholarship support encompasses and what it does not. One interviewee noted there are libraries with “soups-to-nuts” support, but described their current approach as more of an “expert consultation

model.”^{lxxv} In a conversation that reflected discussions with faculty about digital scholarship roles, peers at one organization remarked, “We’re not a technology shop...We are people who can partner with faculty. We’re coming at this like librarians. We’re thinking in services. It works here.”^{lxxvi}

Peers continuously evaluate what services and projects they can reasonably support. One peer organization distinguished between supporting small projects (such as providing consultation on a tool) and more complex projects. With the latter, a steering group that is composed of “a variety of stakeholders” conducts a review. The peer staff member explained, “We’ve [the steering group] created criteria for the kinds of projects we are going to do. They have to be repeatable, scalable, sustainable. Sometimes you say ‘no.’”^{lxxvii} Another peer noted that the evolution of her organization’s capabilities in supporting digital scholarship means that there are times that they must delay their involvement in a project: “Sometimes we have to not turn a project away, but say ‘come back in a few months’, or ask them to come back after they’ve better defined their project. There’s also the question of [whether they bring along] funding, or a graduate student. Sometimes our infrastructure just isn’t ready.”^{lxxviii}

Finding P2: Peers consider the role of Liaison librarians to be key in digital scholarship support

Similar to ULS staff, peers identified liaison librarians, with their subject-area expertise and connections with academic departments, as having a central role in digital scholarship support. At some of these peer libraries, a team-model, with a liaison as a member, has been a strategic approach for the organizational structure around digital scholarship support.^{lxxix} One peer described a three-pronged organizational structure (described more fully in *Finding P3* below) where one arm is the subject specialists. This organization offers “an ongoing training, not so they need to become experts, but if they are liaisons they need to know enough about DS, and how the high tech spaces work.”^{lxxx}

Still, peers pointed to challenges in eliciting steady involvement from liaisons and providing opportunities for them to develop necessary skills (*see Finding P4*). Data management support, one peer observed, must be a distributed responsibility that includes participation from liaisons, but she reported struggling to achieve consensus around this view within her library.^{lxxxi} Another remarked about the challenges related to workloads, particularly for already busy liaisons: “The biggest challenge is figuring out the scope of work -- how do we take this opportunity on, but not this one? How do I, as subject specialist, say we can take this on?”^{lxxxii}

Finding P3: Peers are experimenting with organizational structures to support digital scholarship, but commonly make use of cross-organizational collaborative groups

Just as there is fluidity in their services, spaces, and resources, the organizational structures that peers build around digital scholarship continue to evolve as well. One common approach, however, is a collaborative project-based or service-based team model that brings together staff from departments

across the library organization. For individual projects, one peer described designating a project manager who serves as the lead for the initiative and who calls upon appropriate players from within their organization to participate as team members.^{lxxxiii} Peers described retreats as a forum for strategic and project planning, as well as regular meetings that bring together project teams.

Another peer described a “network” structure for supporting digital scholarship, explaining,

There’s a Digital Scholarship center, with a staff of one. That covers intellectual property and scholarly communication; the staff member is both a lawyer and a librarian. [Secondly,] a Digital Library Initiatives department that’s the technical arm of Digital Scholarship services. They help run the high-tech spaces, the collaborative spaces, and the visualization spaces. The third arm, is our subject specialists. On that front, we have a GIS specialist. Also, subject specialists have prongs out into faculty. We are combining that with heavy doses of expertise. We have several high-tech spaces in new library. Overall, we have a more diffuse model that what I’m seeing in other libraries now.^{lxxxiv}

Finding P4: Peers are concerned about developing staff capability to support digital scholarship and are using a variety of approaches to do so

Peers rely on a mix of existing staff, student workers, and, to some degree, new hires for supporting digital scholarship services. Peers described varying approaches to skilling existing staff, including incentives in the form of travel and training opportunities and annualized goal-setting related to digital scholarship. One library was enthusiastic about its use of a track of high-tech student workers to provide assistance to faculty and students using specialized space and equipment.

When needs cannot be met with existing staff, peers re-allocate existing and vacant positions for new hires with desired areas of expertise. At one peer organization, existing library staff had most of the necessary expertise to support services and new initiatives surrounding digital scholarship except in the area of visualization. Staff vacancies were consequently repurposed to employ a visualization coordinator.^{lxxxv} Two peers described the value of postdoctoral appointments (through the CLIR fellowship program) as a means of staffing and building the necessary human infrastructure to support digital scholarship initiatives.^{lxxxvi}

Finding P5: Peers recognize the importance of branding and promoting their services, but are often find this work challenging

Peers are marketing their capabilities in a variety of ways and interviewees shared their approaches for promoting space, services, and resources. One organization, for example, described holding open houses for schools on campus and meeting with campus partners for “goal sharing sessions.” The library has also generated a “portfolio of successes” that the staff uses for communicating the type of support

that is available to faculty and students. Peers view reputation building and positive word of mouth as a critical marketing method.^{lxxxvii} One organization described how, over time and through visible contributions, the library developed a reputation on campus as knowing about digital humanities.^{lxxxviii} Another indicated that providing space for faculty to meet with their classes as been important in building awareness that the library is a player in digital scholarship on campus.^{lxxxix}

Branding is a challenge, especially for those without a branded center. For one peer organization with “diffuse,” cross departmental support for digital scholarship, staff grapple with the question of whether they need “a branded hub, a name just to give it that kind of resonance and make it clear to people.” Lack of understanding, the peer interviewee observed, has “been a weakness for us ... it would be helpful to have stronger branding and identify.”^{xc}

Finding P6: Peers use physical space to support digital scholarship in a variety of ways

For each of the peers studied in this audit, digital scholarship support involves one or more physical service points. Peers described a mixture of common areas, labs, makerspaces, visualization environments, and adaptable spaces. The peer institutions studied in this audit have spaces where there is a blending of high- and low-tech features, with, for example, movable walls paired with high-definition projectors and large-scale screens.

Finding P7: Several universities have interdisciplinary tracks or clusters that provide obvious areas of focus for the library’s digital scholarship support

In September 2013, Inside Higher Ed described a growing trend among universities for cluster hiring or the practice of “hiring multiple faculty into interdisciplinary research areas.” One peer organization interviewed for this study is among the universities that are experimenting with this method. For that library’s digital scholarship support, the university’s cluster hiring informs and helps to define areas of focus. Examples of cluster areas at this peer institution include data-driven science, digital transformation of education, and geospatial analytics – all areas of research that would clearly benefit from and connect with the library’s support for digital scholarship.^{xc}

Recommendations

Note: The recommendations that follow are intended to support planning, decision-making, and future allocations of resources. As such, they are aspirational and deliberately emphasize strategy over implementation. In some cases, the ULS has already started work that is recommended; in some cases it has not. Wherever possible, the recommendations refer back to the findings presented earlier as rationale.

1. General Recommendations

Recommendation 1.1: Treat digital scholarship support as a core service of the ULS broadly, rather than primarily the responsibility of technology-centric departments

In a 2011 report for the Association of Research Libraries, Tyler Walters and Katherine Skinner issued a call for academic research libraries to become active players in the digital scholarship communities on their campus. This role, they stressed, aligns with and extends the traditional mission and activities of the academic library. They maintain, “[I]f research libraries assertively take on this role, they hold the promise to become vibrant think tanks and digital production and management zones, thus building on their traditional role as a content caretaker.”^{xcii} These authors, and the peer institutions studied during the course of this audit, view digital scholarship support as a core role of the organization rather than of select entities within the organization. Inside the ULS, responsibility for the success of digital scholarship initiatives is shared across the organization (*Findings U2, U3*), and there is strong interest across the organization in developing new capabilities and increasing collaborations on campus and beyond (*Findings U5, U6, U7*).

Recommendation 1.2: Expect to experiment, iterate, and evolve.

Digital scholarship is an emerging set of practices and needs. The supporting infrastructure, including the technologies used, the availability of supporting staff with expertise, and the organizational configurations supporting such work are all changing rapidly for most libraries working in this area. The literature reviewed and conversations with peers indicate that for libraries offering digital scholarship support, the physical spaces *and* the service models are most often new and in-development. Lippincott writes, “centers in their early stages are experimenting with various services and staffing models as they develop partnerships and engage with various researchers; even well-established centers frequently adjust their priorities and services as the nature of digital scholarship and those engaged with such work on campuses evolves.”^{xciii} The ULS should expect to treat its own digital scholarship services with a similar degree of experimentation, plan to iterate, and expect evolve over time.

2. Services

Recommendation 2.1: Define digital scholarship services in a consolidated and visible portfolio

Interviews with both faculty and internal ULS groups revealed gaps in awareness of the resources currently available at the University and offered through departments within and external to ULS. A consolidation of information about these activities and resources would be of value to faculty, students, and within the ULS. There are some existing service listings, such as the “Services” menu on the library website, and in the LibGuide, “ULS Research Help @ Pitt,” but they are incomplete and in need of expansion.^{xciv}

Table 3 presents a proposed portfolio of existing and new digital scholarship services. The recommendations in this section that follow the proposed portfolio identify current gaps, and indicate resources and expertise in need of development or expansion.

Table 3: A Proposed Portfolio of Digital Scholarship Services

Service Description	Current Status	Rationale
Digitization: self-serve and staffed imaging, optical character recognition (OCR)	Existing capability, needs development of service model, increased visibility, and front-end	<ul style="list-style-type: none"> ▪ Evidence of widespread / common faculty and student need ▪ Supports other service areas, e.g., creating digital special collections, GIS ▪ Supports many in-house initiatives
Metadata standards and schema: selection, creation, application	Some existing capability, needs development of service model, expansion of capability, increased visibility, and front-end	<ul style="list-style-type: none"> ▪ Evidence of widespread / common faculty and student need ▪ Supports other service areas, e.g., data management ▪ Supports many in-house initiatives ▪ Aligns with library roles of descriptive and organizational expertise
Resources for audio, video, still-image, and web media content creation	Little to no existing capability	<ul style="list-style-type: none"> ▪ Evidence of student need ▪ Lack of centralized resources elsewhere
Support for research data management	Little to no existing capability	<ul style="list-style-type: none"> ▪ Strong interest from some faculty ▪ Interest across University groups (e.g., CSSD, University Senate, iSchool, HSLS) ▪ Potential partnerships ▪ Aligns with library roles of curation and stewardship
Intellectual Property Consultation; Open Access advocacy and support, including the OA Author Fee Fund	Existing capability	<ul style="list-style-type: none"> ▪ Rationale is well-articulated by the ULS Open Access site¹
Textual and numeric data: support for identifying, acquiring, creating, analyzing, sharing.	No existing capability	<ul style="list-style-type: none"> ▪ Evidence of widespread / common faculty and student need ▪ Aligns with library roles of supporting research and knowledge creation

¹ <http://openaccess.pitt.edu/>

Service Description	Current Status	Rationale
Geographic Information Systems (GIS) data: support for identifying, acquiring, creating, analyzing, sharing.	Basic existing capability, needs development of service model, expansion of capability, increased visibility	<ul style="list-style-type: none"> ▪ Evidence of widespread / common faculty and student need ▪ Supports other service areas, e.g. support with acquiring, analyzing data, and interpretive presentations of digital content
Support for the creation of digital special collections and scholarly resources; exhibits and interpretive presentations of digital content	Some existing capability, builds on digitization work; little existing capability in supporting interpretive presentations of digital content	<ul style="list-style-type: none"> ▪ Aligns with library roles of curation and stewardship, providing access ▪ Supports many in-house initiatives
Subject-Based Digital Archives	Existing capability	<ul style="list-style-type: none"> ▪ Rationale well-articulated by the Office of Scholarly Communication and Publishing²
E-Journal Publishing	Existing capability	<ul style="list-style-type: none"> ▪ Rationale well-articulated by the Office of Scholarly Communication and Publishing³
Bibliometrics, altmetrics, academic intelligence	Emerging capability	<ul style="list-style-type: none"> ▪ Aligns with library's commitment to providing support through the research lifecycle ▪ Aligns with the priority articulated in ULS Long Range Plan for FY 2014-2017 that calls for the development of "new services to showcase the impact and output of the University's research activities"
Digital stewardship, preservation, and repository services, including the D-Scholarship Institutional Repository	Some existing capability, build upon existing institutional repository to generalize digital stewardship services and to extend them to born-digital archival content, harvested online content, and complex works of digital scholarship	<ul style="list-style-type: none"> ▪ Aligns with library roles of curation and stewardship, providing access ▪ Evidence of widespread / common faculty and student need ▪ Born digital content requires ongoing care ▪ Researchers developing digital projects may not have the knowledge or capacity required for proper stewardship

² <http://www.library.pitt.edu/subject-based-archives>

³ <http://oscp.library.pitt.edu/uls-e-journal-publishing/why-publish-with-us/>

Recommendation 2.2: Develop University-facing service and supporting policies for digitization

The ULS has a well-developed capacity for two-dimensional print and graphic image digitization. It maintains specialized equipment and expert staff. While digitization is a commonly-mentioned piece of supporting infrastructure for a variety of digital scholarship practices, there is currently no outward-facing service or supporting policies presenting ULS digitization services to the University community. Appropriate policies and procedures should be created and communicated to the University community.

Recommendation 2.3: Develop and expand University-facing service and supporting policies for metadata standards and schema support

As with digitization, the ULS has a developed capacity of expertise around metadata, descriptive standards, and vocabularies that are of use in support of digital scholarship (*Findings F18 and U1*). This expertise should be supported by a service model, and should pull together those with expertise who may be located in various departments across the ULS. Services in this area may include consultations with researchers on metadata aspects of digital projects and support for metadata practices in research data management.

Recommendation 2.4: Adopt a lifecycle framework for developing and communicating research and data management services

In conversations with faculty, using the research lifecycle model to describe potential services was effective in moving beyond simple perceptions of data management support. The ULS should make use of a research lifecycle model in developing and articulating new research and data management services for the campus community. With the lifecycle model in mind, ULS might offer researchers support for data management planning, guidance on accessing datasets, or consultations on description, preservation, and sharing of data.

Recommendation 2.5: Identify responsible individuals and create online informational resources to establish our stake in support for research data management at the University

Internal ULS interviews indicate that while research data is an identified area of opportunity, the ULS currently presents little supporting information, and more importantly, has not identified staff with particular responsibility in this area (*Finding U5*). As a “quick win”, the ULS should designate individuals to develop online content that will identify general supporting resources and establish the ULS as having a stake in data management issues within its user communities. In accord with recommendation 1.1, this effort should include individuals from across the organization, including, for example postdoctoral researchers for digital scholarship, staff from the OSCP, and Liaison Librarians.

Recommendation 2.6: Advocate, at the University level, for research data management infrastructure and the importance of the ULS role in it.

ULS senior leadership should work with ULS staff, senior leadership from CSSD, the Office of Research, the Health Sciences Library System, and the iSchool to advocate for a University-wide data management infrastructure. While doing so, the ULS should advocate for its own importance in playing a role in informational, curatorial, and stewardship aspects of research data management.

Recommendation 2.7: Increase ULS partnership with the iSchool in developing research data management capabilities.

The iSchool is a site of expertise in research data management and has a growing interest in the role of academic libraries in supporting digital scholarship (see *Recommendation 6.1*). The ULS can take advantage of this expertise through the participation of ULS staff in course offerings in this area, the participating in relevant research with iSchool faculty, and in making the ULS a site for the iSchool to present as an exemplar of research data management in practice.

Recommendation 2.8: Establish support for data management plans (DMPs) by configuring DMPTool for Pitt researchers, coordinating local boilerplate language, and coordinating the promotion of the tool

A large number of faculty need, and would appreciate, assistance in developing data management plans (*Findings F15 and F17*). Faculty, and environmental scanning, also indicate that DMPs are given only rudimentary support elsewhere on campus. The ULS is in a good position to provide support to faculty and doctoral students currently engaged in writing data management plans by hosting, or coordinating the hosting of a DMP support tool such as DMPTool^{xcv}. The work required to obtain appropriate and current boilerplate language for such a tool would also be a means to engage with data management stakeholders across campus.

Recommendation 2.9: Develop expertise in data acquisition, data set creation, analysis, sharing, and stewardship

As the ULS builds support services for digital scholarship, ULS staff should continue to build skills that can support researchers during the entirety of the research lifecycle. There should be staff in the ULS with an understanding of methods for acquiring, analyzing, and visualizing datasets. The ULS, as noted in Recommendation 6.2, should liaise with centers on campus that offer analytical and visualization services and that employ staff with expertise in this area.

Recommendation 2.10: Develop expertise in GIS and geospatial data creation and analysis

The ULS has an existing basic capability and resources (support staff, a LibGuide, and a GIS terminal) to support GIS usage. However, internal ULS conversations and discussions with faculty and peer libraries (e.g., *Finding U8*, *Finding F7*) show that there is a great deal of interest in GIS and that it is seen as an important cross-disciplinary practice supporting many forms of digital scholarship. To expand its capacity for GIS support, the ULS should develop the expertise of existing staff or, if necessary, target new hires with specialized expertise. This recommendation may be supported by others below, especially those in Section 6, *Partnerships*.

Recommendation 2.11: Develop expertise in digital curation and stewardship of non-traditional digital scholarship

In an article that appeared in *The Chronicle of Higher Education* in January 2014, Jennifer Howard describes digital stewardship as “an essential but easily overlooked element” of digital scholarship projects.^{xcvi} Faculty are looking to the ULS to fill this role (*Finding F18*). The ULS should continue to build expertise among its staff and the supporting resources to support the stewardship of digital projects. This role aligns with the library’s traditional stewardship responsibilities for its general collection, special collections, archival holdings, and existing digital collections including the institutional repository. These existing stewardship responsibilities can be examined to inform the development of non-traditional digital scholarship services, including policy, procedures, and resource allocation.

Recommendation 2.12: Be advocates for data sharing practices.

In 2012, Christine Borgman observed that “the ‘dirty little secret’ behind the promotion of data sharing is that not much sharing may be taking place...Data sharing activities appear to be concentrated in a few fields, and practices even within these fields are inconsistent.”^{xcvii} Sharing is an important aspect of the research data lifecycle (*Recommendation 2.4*), and is increasingly mandated by funders. The ULS has effectively raised awareness about open access at the University of Pittsburgh through an online space and programming during Open Access Week. The ULS should build upon this advocacy work that has been done for scholarly publications and extend the conversation to research data.

Recommendation 2.13: Enhance organizational capacity in bibliometrics for impact.

Bibliometric tools and methods have been altered dramatically in recent years due to shifts in technology and resulting changes in the scholarly publication landscape. In parallel, these tools and methods are increasingly used by funders of research to guide their funding decisions.

The ULS is well positioned to extend its current scholarly publication services to include provision of bibliometrics tools and advice to individual researchers and research groups on how to use bibliometric indicators to identify publishing venue for best impact and to demonstrate impact of their research to different audiences.

3. Staffing and Organization

Recommendation 3.1: For each service area, establish a tiered model for levels of service provision. Include expected competencies for all staff, for Liaison Librarians, for service “specialists”, and service “experts”.

The ULS should clearly define which staff positions are involved with services that are part of the digital scholarship portfolio and the competencies that individuals in these positions should have to support the services. It is recommended that the organization adopt a model that is akin to one in place at the University of Queensland in Australia, which the Manager of Scholarly Publications presented to the attendees of the Bibliometrics Seminar in May 2014 at the ULS. Such a model establishes a tiered approach to service provision, identifying three levels of expertise in the service area. For each of the services within the digital scholarship the ULS should identify the accompanying responsibilities and competencies that are expected of individuals in these positions.

Recommendation 3.2: For each service area, identify and publicize specialists and experts, internally and externally

Following *Recommendation 3.1*, the ULS should publicize the designated specialists and experts for both an internal and external audience. Much as we build Liaison Librarian profiles for subject and departmental connections, we should make it clear who the point people are for each of our service areas around digital scholarship.

Recommendation 3.3: Programmatically develop the skills of existing staff at various levels

Existing library staff should know the basics of digital scholarship services, how to represent them to those they work with, and whom to refer for more specialized assistance. Those identified as “specialists” or “experts”, with accompanying expectations (*Recommendation 3.1, 3.2*) should receive a greater degree of ongoing training. All ULS staff should feel comfortable representing capabilities and expertise as *our* service rather than belonging to individuals or an organizational unit of the library. The training recommendations in section 5 below can include ULS staff as well as community members, and some of that programming can be specifically targeted towards developing digital scholarship skills. Other libraries have developed programs for skilling up internal staff specifically around digital scholarship that the ULS can learn from and adapt to meet its needs. Examples include:

- Stanford University, DigiPrep Workshops: <https://digitalhumanities.stanford.edu/digiPrep>
- Columbia University, The Developing Librarian Project: <http://www.developinglibrarian.org/about/>

Recommendation 3.4: Identify gaps in expertise that are difficult or impossible to fill with existing staff; strategically target hiring new staff with relevant expertise as feasible

As services in the area of digital scholarship evolve, the ULS should note areas in which gaps in skillsets cannot be addressed by developing skills of existing staff (*Recommendation 3.3*). In addition to considering targeted new hires, the ULS may consider continuing the model of joint postdoctoral appointments with the iSchool, or negotiate shared positions with centers on campus that currently support digital scholarship through, for example, analytical or visualization services. Services may also be supported with targeted student appointments (*Recommendation 3.5*).

Recommendation 3.5: Create a track of “high-tech” student workers with greater responsibility and pay

The ULS should consider creating technology-centric student positions that will support digital scholarship services. The ULS might hire graduate students from computer sciences, engineering, and geology and planetary sciences, for example, in an effort to support existing and new services in GIS, metadata support, data management, data analysis and visualization, and digital stewardship. Faculty have indicated they are looking for opportunities for their advanced students to do work in these areas (*Finding F9*).

As the curriculum at the iSchool evolves to offer a growing set of courses in digital curation and research data management, the ULS might support its needs, as well as partnering to provide opportunities for student learning, through work placements in these areas (also supports *Recommendation 6.1*).

Recommendation 3.6: Conduct all non-programmatic digital scholarship work using a team-based (rather than department-based) project management framework and an inclusive coordinating group, including Liaison Librarians. Consolidate and standardize the initiation, resource allocation, team formation, and tracking of digital scholarship initiatives, and share their progress with the ULS in a transparent manner.

Just as digital scholarship is itself characterized by collaboration and team-based work, the ULS should embrace a collaborative approach for supporting and engaging with digital scholarship on campus. Digital scholarship, as defined in this project, is work that touches many aspects of the ULS as an organization. As such, it should not be considered the provenance of a single department or unit. Building on earlier recommendations (*1.1, 2.1*), the ULS should consider conducting all non-

programmatic digital scholarship project work (i.e., new initiatives), by using a team-based framework, with representation from across the organization as appropriate.

Following findings establishing the importance of Liaison Librarians in digital scholarship activities (*Findings U3, P2*), Liaisons should be included in the coordination of digital scholarship initiatives. Following several internal ULS findings related to low understanding of how digital scholarship resources are allocated and where responsibilities lie (*Findings U2, U3*), all of the activities around project management of digital scholarship initiatives should be communicated and shared in a transparent manner.

Recommendation 3.7: Experiment with a small-grants model for awarding resources in one or more of the service areas.

A small-grants model for supporting digital scholarship on campus might award funding to faculty or graduate students to be allocated for existing and new ULS services and support. This would accomplish several things: it would signal to the University community that the ULS is actively supporting innovative research on campus; it would incentivize faculty to use the resources and services the ULS has in place and develops; it would assist ULS staff in planning and anticipating the use of resources and staff support for digital scholarship over a known period of time; and, during the early iterations of new digital scholarship services, available tools, and a physical service point, the ULS can learn from experiences and feedback that the grant recipients provide and respond accordingly.

4. Physical and Virtual Resources

Recommendation 4.1: Create a physical service point for ULS digital scholarship services and resources

The ULS should create a physical space where researchers can meet with staff for walk-in consultations and discussions about project initiation. This should be a shared cross-departmental space that supports the team model described in *Recommendation 3.6*. Such a space will act as an entry-point for accessing the services provided within the proposed digital scholarship portfolio (Table 3).

Recommendation 4.2: Create a lab/studio supporting data acquisition and analysis, including GIS and visualization tools

The ULS should develop a lab that supports the acquisition, analysis, and visualization of quantitative and qualitative data. This lab may include GIS, visualization tools, and statistical analysis software, and coding software for qualitative data. The ULS can consider ways in which this lab can serve as a placement center for Pitt Partners students in the iSchool and for student worker positions in general.

The ULS should learn from existing centers on campus as it builds this lab and consider how it can complement and augment the tools currently available through, for example, the Qualitative Data Analysis Program (QDAP) at the University of Pittsburgh's University Center for Social and Urban Research (UCSUR) and the Center for Simulation and Modeling (SaM). Academic departments could showcase such a lab during faculty candidate visits and student recruitment events.

Recommendation 4.3: Create a lab/studio supporting digital content creation

The ULS should develop a digital media lab that would serve as a campus-wide resource for faculty and students. As a centralized location that is detached from a department or faculty member (*Finding F13*), this space would address faculty interests in providing their students with greater access to tools (*Finding F9*) and be a space where users can create and edit audio, video, and still images. The ULS might consider the feasibility of a lending program for equipment such as digital cameras and digital recorders that can be used by faculty and students in creating digital media projects.

Recommendation 4.4: Create spaces to increase visibility, sharing, and social interactions around digital scholarship

The low visibility of digital scholarship on campus is a thread that runs throughout this report. Faculty observed that there is currently no place on campus where creators of digital scholarship can exhibit and share their work publicly or with a cross-departmental research team (*Finding F8*). The ULS should consider the creation of a visually-intensive presentation and exhibit space with large monitors, projections, or video walls.

Recommendation 4.5: Conduct a periodic quantitative audit of existing repositories and local digital collections to identify opportunities for community-building, collection development, and to support the prioritization of resources

As mentioned in the Methodology section of this report, this investigation was conceived in part to systematically review the ULS's existing digital collections in a quantitative way; to analyze, for example, patterns of collection growth, use, the diversity of content, and to measure the visibility of collection content. Although such a systematic review did not take place, it has potential for identifying development opportunities and prioritizing resources, and this recommendation suggests that the ULS conduct such a review periodically.

5. Outreach, Training, and Promotion

Recommendation 5.1: Identify liaisons to areas of expertise, not just departments. Communicate the identities of experts and specialists in services.

The current liaison model focuses on subject responsibilities. *Recommendation 3.2* concerns extending this model to identify those with responsibility (these may be the “experts” and “specialists”) for services in our portfolio of support of digital scholarship. These liaisons to expertise should be publicly communicated; in such a model, subject liaisons can identify and work with current and future service owners in designated areas, including bibliometrics, data management, and GIS.

Recommendation 5.2: Promote and share our expertise with a consolidated and visible listing of training and workshops

There is great deal of existing expertise within the ULS, sometimes shared in presentations and workshops, but workshops are not always centrally described or made visible. In addition to a consolidated list of workshops and trainings from across the ULS, it would be useful to create a “menu” of possible workshops and events that interested faculty, classes, or departments could use to request custom programming; this would also serve to promote and raise the visibility of ULS expertise.

Recommendation 5.3: Reframe existing and newly-designed technology trainings and workshops

As *Finding F10* reveals, faculty are motivated to invest the energy and time required to learn new tools only when they see a clear benefit for their own research. Interviewees question the effectiveness of tutorial-based technology trainings and are hesitant to participate in them. Faculty and students now have access to the Lynda library of technology trainings, which creates an even lower demand for in-person that focus on how to use a tool from a technical perspective. However, faculty are interested in tracking tools and methods that they observe being used by peers in their disciplines (*Finding F7*).

The ULS can attract greater attendance and interest for technology trainings and workshops by developing sessions where researchers are encouraged to bring their own data with them and to share the methods and results of their work. These approaches facilitate peer to peer learning, providing faculty and students with opportunities to experiment with tools together, to encounter potential collaborators across disciplines, and to learn from successful applications.

6. Partnerships

Recommendation 6.1: Consider the iSchool a key partner around digital scholarship

As articulated several times already in this report, the iSchool faculty, administration, and students are important partners for the ULS because of shared areas of focus, complimentary expertise, and a mutual interest in collaboration (*Finding F6*). Two jointly-appointed postdoctoral positions to support digital scholarship are currently funded; this is one important building block of the partnership. Others may include encouraging iSchool faculty and students to use spaces and resources within the ULS (*Recommendations 4.1, 4.2, 4.3, 4.4*), working with iSchool faculty and students on areas of mutual interest, such as research data management (*Recommendation 2.7*), partnering with iSchool faculty and doctoral students to deliver workshops and programming (*Recommendation 5.3*), and appointing iSchool students in specifically-targeted student employment to support digital scholarship facilities (*Recommendation 3.5*).

Recommendation 6.2: Build or expand relationships with existing centers on campus that support digital scholarship

There are several existing centers on campus that offer services or tools that can be used to support digital scholarship. Examples include the Robert Henderson Language Media Center^{xcviii}, UCSUR^{xcix}, the Statistics Consulting Center^c, and the Center for Simulation & Modeling, with its commitment to “supporting and facilitating computation-based research across the university.”^{ci} The ULS should avoid duplicating the efforts of entities like these. Instead, the ULS should learn more about these centers, linking library users to resources and services that they offer. In addition, the ULS should invite individuals at these centers to conduct training or consultations at Hillman (including for ULS staff, per *Recommendation 3.3*), thereby raising the visibility of the services that these centers offer and assisting the centers in reaching an untapped user base.

Recommendation 6.3: Increase use of, benefits received from relevant membership organizations

Finding U7 observed that ULS staff are interested in drawing more value and partnership opportunities from external organizations and memberships; *Finding U8* notes the lack of internal capacity and expertise around several areas identified for development. *Finding P1* shows peer libraries are also working through models of service and staffing around digital scholarship. All of these findings indicate the ULS could increase the value that it takes from relevant membership organizations by broadening our participation and pushing for ways that the partnerships can help address ULS needs through collaboration. Existing relevant partnerships include those with HathiTrust, DuraSpace, the Public Knowledge Project, and the National Digital Stewardship Alliance. Moreover, in new areas of focus for

the ULS, such as research data management, the ULS should identify whether there are any organizations that would provide valuable contacts and support.

Acknowledgements

A project such as this one, based so heavily on interviews, would have had little to report without the generosity and good will of all of those who agreed to sit down and talk -- formally or informally, individually or in groups. Great thanks are due to all of the participants in this project.

Additionally, several colleagues in the ULS provided tremendous help and shared their expertise at various stages of the project: Karen Calhoun, Eve Wider, Ed Galloway, Jeanann Haas, and John Barnett all contributed to the project's conception; Lauren Collister gave expert advice on ethnographic methods and interview design; Berenika Webster provided guidance on research methods, data analysis and interview coding; Fern Brody and the members of the Knowledge Commons project team provided both direct and complementary support during much of the project's timeframe; and, at the conclusion of the project, Nora Mattern provided crucial assistance with interview analysis and writing the report.

ⁱ University Library System, University of Pittsburgh, "Long Range Plan 2014-2017", <http://www.library.pitt.edu/other/files/pdf/about/LRP14-17.pdf>

ⁱⁱ Asher and Miller (n.d.) A Practical Guide to Ethnographic Research in Academic Libraries, retrieved July 2014 from <http://www.erialproject.org/wp-content/uploads/2011/03/Toolkit-3.22.11.pdf>

ⁱⁱⁱ See "ULS Digital Scholarship SA 2014," https://www.zotero.org/groups/uls_digital_scholarship_sa_2014.

^{iv} Joan K. Lippincott, "Overview: Digital Scholarship Centers" in "Trends in Digital Scholarship Centers," by Joan K. Lippincott, Harriette Hemmasi, and Vivian Marie Lewis, *EDUCAUSE Review*, June 16, 2014, <http://www.educause.edu/ero/article/trends-digital-scholarship-centers>.

^v Faculty interviewee, interview by Aaron Brenner, May 28, 2014, transcript DSA14_010.

^{vi} Faculty interviewee, interview by Aaron Brenner, May 20, 2014, transcript DSA14_009; transcript DSA14_010.

^{vii} Faculty interviewee, interview by Aaron Brenner, May 30, 2014, transcript DSA14_011.

^{viii} DSA14_010.

^{ix} Faculty interviewee, interview by Aaron Brenner, May 5, 2014, transcript DSA14_008.

^x Faculty interviewee, interview by Aaron Brenner, May 2, 2014, transcript DSA14_006.

^{xi} Faculty interviewee, interview by Aaron Brenner, April 21, 2014, transcript DSA14_003.

^{xii} DSA14_006.

^{xiii} DSA14_003.

^{xiv} DSA14_003.

^{xv} DSA14_011.

^{xvi} Faculty interviewee, interview by Aaron Brenner, April 10, 2014, transcript DSA14_001.

^{xvii} For an overview of CIDDE's equipment available to instructors, see "Available Technology", CIDDE, accessed August 10, 2014, <http://www.cidde.pitt.edu/classroom-services/available-technology/>

^{xviii} DSA14_001.

^{xix} DSA14_001.

^{xx} DSA14_010.

^{xxi} DSA14_003.

^{xxii} DSA14_011.

^{xxiii} DSA14_011.

^{xxiv} DSA14_003.

^{xxv} DSA14_003.

^{xxvi} DSA14_010.

^{xxvii} For an overview of available software, see "Software in Campus Computing Labs," CSSD, accessed August 10, 2014, <http://www.technology.pitt.edu/software/computing-labs-software.html>

^{xxviii} Faculty interviewee, interview by Aaron Brenner, April 21, 2014, transcript DSA14_002

^{xxix} DSA14_003.

^{xxx} DSA14_002

^{xxxi} DSA14_010.

^{xxxii} DSA14_002.

^{xxxiii} DSA14_003.

^{xxxiv} Faculty interviewee, interview by Aaron Brenner, April 21, 2014, transcript DSA14_004.

^{xxxv} DSA14_010.

^{xxxvi} DSA14_004.

xxxvii DSA14_003.

xxxviii DSA14_009

xxxix Faculty Interviewee, interview by Aaron Brenner, April 29, 2014, transcript DSA14_005.

xl DSA14_002.

xli DSA14_001.

xliv DSA14_001.

xlvi DSA14_002.

xlvii DSA14_002.

xlviii DSA14_001.

xlvi DSA14_010.

xlvi DSA14_006.

xlvi DSA14_006.

xlvi DSA14_006.

l DSA14_017.

li ULS interviewee, interview by Aaron Brenner, May 27, 2014, DSA14_014.

lii ULS interviewee, interview by Aaron Brenner June 26, 2014, DSA14_016.

liii TO-DO – Internal (IT or OSCP)

liv DSA14_016.

lv TO-DO – Internal, IT or OSCP

lvi DSA14_017.

lvii TO-DO – Internal , IT or OSCP

lviii See “Classes, Workshops, and Tours” <http://www.library.pitt.edu/classes-workshops>

lix DSA14_016.

lx DSA14_014.

lxi DSA14_017.

lxii DSA14_016.

lxiii TO-DO Internal, OSCP or IT

lxiv ULS interviewee, interview by Aaron Brenner, June 24, 2014, DSA14_018.

lxv DSA14_017.

lxvi DSA14_017.

lxvii DSA14_017.

lxviii DSA14_017.

lxix DSA14_017.

lxx DSA14_017.

lxxi TO-DO Internal, IT?

lxxii TO-DO Internal, BW

lxxiii DSA14_016.

lxxiv Peer interviewee, interview by Aaron Brenner, August 5, 2014, DSA14_022

lxxv Peer interviewee, interview by Aaron Brenner, July 1, 2014, DSA14_020.

lxxvi Peer interviewee, interview by Aaron Brenner, August 5, 2014, DSA14_022

lxxvii DSA14_022

lxxviii Peer interviewee, interview by Aaron Brenner, July 2, 2014, DSA14_021

lxxix DSA14_020.

lxxx DSA14_020.

lxxxi DSA14_021

lxxxii DSA14_020.

lxxxiii DSA14_022

lxxxiv DSA14_020.

lxxxv DSA14_020.

lxxxvi Peer interviewee, interview by Paul Kohberger, April 22, 2014, DSA14_019; DSA14_021.

lxxxvii DSA14_019.

lxxxviii DSA14_022

lxxxix DSA14_019.

xc DSA14_020.

^{xci} DSA14_020.

^{xcii} Tyler Walters and Katherine Skinner, *New Roles for New Times: Digital Curation for Preservation* (Washington D.C.: Association of Research Libraries, March 2011), 17.

^{xciii} Lippincott, "Overview: Digital Scholarship Centers."

^{xciv} See: "ULS Research Help @ Pitt: Services," <http://pitt.libguides.com/c.php?g=12415&p=65896>

^{xcv} DMPTool, see <https://dmp.cdlib.org/>

^{xcvi} Jennifer Howard, "Born Digital, Projects Need Attention to Survive," *The Chronicle of Higher Education*, January 6, 2014, <http://chronicle.com/article/Born-Digital-Projects-Need/143799/>

^{xcvii} Christine Borgman, "The Conundrum of Sharing Research Data," *JASIST* 63, no. 6 (2012):1059

^{xcviii} <http://www.polyglot.pitt.edu/>

^{xcix} <http://www.ucsur.pitt.edu/>

^c <http://www.stat.pitt.edu/resources/statistics-consulting-center>

^{ci} "About Us," Center for Simulation & Modeling, accessed August 10, 2014, <http://www.sam.pitt.edu/about-us/>.

Project Charter

Project Name	Strategic Audit of Digital Scholarship Services
Project Lead	Aaron Brenner
Project Sponsor	Rush Miller
Start Date	January, 2014
End Date	June, 2014

Project Goals

The ULS has an established portfolio of services in support of digital scholarship including digitization, scholarly repositories, and open access digital publishing. While we have been successful in those initiatives, new models of library support for digital scholarship are emerging and generating interest both locally and among peer institutions. Examples of these services include research data curation, support for digital humanities research, and social and participatory features in digital libraries. To keep our services appropriately aligned to the evolving environment and to support the evolving needs of scholars and researchers at the University of Pittsburgh, the ULS should carefully consider the potential value, feasibility, and relative strategic importance of new digital scholarship services moving forward. At the same time, we have already made considerable investments in our existing digital collections, subject repositories, and services; this audit would be an opportunity for the ULS to address the vitality and sustainability of those initiatives.

Scope

A strategic audit will consist of: 1) a review of existing ULS digital scholarship support services, including an inventory of existing digital collections and subject repositories 2) a survey of faculty and centers at Pitt who use, or wish to use, tools and services for digital scholarship; 3) a survey of peer institutions and relevant member organizations are doing work in these areas.

The project work will inform, and be informed by, the concurrent work of the ULS Knowledge Commons project team; the project lead is also a member of that group.

Out of scope: although they are part of the ULS portfolio of support for digital scholarship, the ULS E-journal publishing program and D-Scholarship, the institutional repository, will not be

included in the audit of existing digital collections.

Deliverables

Following the surveys, a report issuing recommendations will be written and shared with ULS colleagues and Senior Staff. The report will address existing collections and services as well as suggesting priorities for expanding our portfolio of services.

Timeline

The following are the high-level activities of the project and their anticipated timelines :

Attend Pitt iSchool Research Data Management Seminar: *January - May, 2014*

Assemble list of interview candidates, internal and external: *February - March, 2014*

Review existing ULS digital collections and services: *February - May, 2014*

Participate as a member of the Hillman Knowledge Commons planning group: *February - June, 2014*

Develop interview questions and protocol: *February - March, 2014*

Conduct interviews: *April - May, 2014*

Analyze interview data: *April - May, 2014*

Write report: *May - June, 2014*

Present report to ULS Senior Staff and colleagues: *June, 2014*

Communication

In addition to the report, which is the project's main deliverable, the project will employ several other channels of communication:

Communication to Project Sponsor

Monthly reports on progress status will be given to the project sponsor and/or ULS Senior Staff.

Communication to ULS Colleagues

The project will be introduced to all ULS colleagues with an open Lunch & Learn presentation. Following that, monthly open project briefings will be held and any interested ULS colleagues will be welcomed to attend. Additionally, a public Zotero group has been created to share relevant web sites, readings, and other resources. The address of the site will be shared with ULS colleagues.

Project Organizational Structure

The primary responsibility for conducting the work of the project and creating the deliverable rests with the project lead.

Consultants and Resources

The project chair will receive consultation and support as needed from the following ULS departments and groups:

- The Office of Scholarly Publishing and Communication
- The Digital Research Library
- ULS Liaison Librarians, and Research and Educational Support
- ULS Information Technology

Questions for Faculty to Assess Digital Scholarship Needs

Note: This interview is designed as a 'semi-structured' interview, in line with the description provided by the UK Data Services' Interview Methods training:

Although the interviewer in this technique will have some established general topics for investigation, this method allows for the exploration of emergent themes and ideas rather than relying only on concepts and questions defined in advance of the interview.

The interviewer would usually use a standardised interview schedule with set questions which will be asked of all respondents. The questions tend to be asked in a similar order and format to make a form of comparison between answers possible. However, there is also scope for pursuing and probing for novel, relevant information, through additional questions often noted as prompts on the schedule. The interviewer frequently has to formulate impromptu questions in order to follow up leads that emerge during the interview.

Usually the interviewer's role is engaged and encouraging but not personally involved. The interviewer facilitates the interviewees to talk about their views and experiences in depth but with limited reciprocal engagement or disclosure.

[<http://ukdataservice.ac.uk/teaching-resources/interview/semi-structured.aspx>]

Introduction

The University Library System is currently conducting a needs assessment of services in support of digital scholarship at Pitt. Digital scholarship includes the use of digital tools, data, methods, authoring, publishing, and stewardship to support teaching and research.

This interview is a part of that needs assessment. We will also be evaluating our current capabilities, services, and projects, and will look at some of the services and models used at peer institutions. For some of the resources and services we discuss today, the ULS may already have some capabilities developed, for some it may not. At this point, we are most interested in gaining a better understanding of the practices and needs here at Pitt.

In order to facilitate an accurate record of this conversation, we would like your permission to create an audio recording. This recording will only be used for transcription purposes and will not be stored or re-used beyond that purpose. When the transcripts are used for reporting, you will not be quoted with direct attribution without first being separately contacted to approve an attributed quote. If you agree to recording, but at any time would like to speak off the record, you are free to indicate this and the recording will be temporarily stopped.

General Information

What are your major areas of research? Current projects? Teaching responsibilities?

Collaboration

Do you collaborate with others at Pitt? Elsewhere?

Your Research: Tools, Hardware, Software, Space

*Introduction: The next set of questions are about software tools, hardware, and space as they relate to your **research**. For these questions, please focus on those used to acquire, organize, manage, analyze, publish, or communicate digital information relevant to your work.*

What are the software tools and/or digital methods that you use in your research?

Are there any software tools or methods that you do not currently use, but which you have an interest in? Are any of those not available or well-supported here?

Do you have a need for specific hardware or physical space for your research that is not met by your personal devices? If so, is it met by an existing lab or facility here at Pitt? Somewhere else? If your need is not met, please describe the need in detail and estimate how often you might use it.

Possible examples here: wikis, blogs, shared storage, scanning, OCR, image processing, text encoding, text analysis [concordance, named entity extraction], geocoding/georeferencing tools, data visualization, audio/visual hardware, large format printing, large monitors/projectors, etc.)

Your Teaching: Tools, Hardware, Software, Space

Introduction: *The next set of questions are again about software tools, hardware, and space, but now as they relate to you **teaching**. Once again, please focus on those used to acquire, organize, manage, analyze, publish, or communicate digital information relevant to your work.*

What are the software tools and/or digital methods that you use in your teaching?
What tools and methods do you expect your students to use or have facility with?

Are there any software tools or methods that you or your students do not currently use, but which you have an interest in? Are any of those not available or well-supported here?

Do you have a need for specific hardware or physical space for your teaching that is not met in your standard classroom? If so, is it met by an existing lab or facility here at Pitt? Somewhere else? If your need is not met, please describe the need in detail and estimate how often you might use it.

Training

Are there areas of training in support of digital scholarship that would be useful in supporting your **research**?

Are there any specific kinds of training in support of digital scholarship that would be useful in supporting your **teaching** -- these could be for your own teaching practice/assignments, or directly supporting your students?

Data Management

How do you acquire data that you use in your research and teaching?

How do you store the data/resources associated with your research and teaching?

Do you need to comply with any mandates for publication or data sharing/management issued by, for example, funders from which you receive support?

Are you interested in support around aspects of data management? This might include creating a data management plan, determining appropriate data formats, using/creating a metadata schema, the application of vocabularies and ontologies, storage resources, sharing (e.g. having a persistent URL for data set), long-term management, re-use.

Publishing and Sharing - Research output, projects, instructional resources

Hosting / support for digital journal or monograph publishing

Other tools for personal / collaborative communication (e.g., wikis, blogs, project-specific web sites)

Open Access, licensing, and intellectual property consulting

Bibliometrics, measuring impact of traditional publications

Altmetrics -- alternative metrics to track the impact of scholarship

Storage and Management of Publications and Data, Bibliometrics

Do you place your *publications* in any repositories? Which ones? Do you receive assistance?

Do you place your *data* in any repositories? Which ones? Do you receive assistance?

Do you use tools to track citations of your publications? To assess the impact of your publications?

Other issues not already mentioned? What would be the ideal / Perfect world?

Other people that I should speak with?

Would you be willing to answer some follow-up questions,, based upon your input, that I can share more broadly? (and/or participate in the ULS survey via Read-Green)

Introduction

Scope: For the purposes of this interview, “Digital scholarship” includes the use of digital tools, data, methods, authoring, publishing, and stewardship to support teaching and research. These may be things already supported by the ULS, or they may be prospective services and resources.

Per the charge for this project, the ULS e-journal publishing program and D-scholarship are out of scope for this conversation. However, the focus can include:

- subject repositories
- digitization and digitized collections
- data acquisition, description, analysis, visualization, stewardship and curation
- digital content creation and sharing
- bibliometrics/altmetrics
- other consultative services
- and the hardware, software, and infrastructure to support all of the above.

Current Work and Resources

Describe the work that you do in support of digital scholarship. What are the drivers of the work?

How is the work organized/structured? Is it based on a project model? A service model? Are there projects that fall outside of designed services?

Do you maintain an inventory/portfolio of projects and/or services? What projects have end dates or states of completion and which are open-ended? What are the existing commitments to ongoing work?

Are there specific software tools, platforms, or other technologies that you have committed to support? What are they? How do you handle requests or needs for other tools and technologies?

How many FTE support this work? What other resources are required? In considering your areas of focus, does the existing staff knowledge and skills fully support them, and if not, how do you address the gaps?

Collaborators, Partners, Users

Who else do you work with in this area, inside the ULS and outside? Are there significant partnerships, memberships, or service agreements that impact this work? Are there collaborations or partnerships in this area -- again, either within the ULS or outside -- that don't currently exist but which you think would be beneficial?

How do people discover your services? Are there resources or capabilities that you have that you feel are underutilized?

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Initiation, Scheduling, Capacity

How is specific work in support of digital scholarship agreed-upon and scheduled?

How do you determine your capacity for taking on work, particularly when collaborating with or supporting people external to the library? Is capacity for existing or new responsibilities a concern? How are the available resources impacted by other responsibilities? What are constraints? Are there opportunities to stop any work, or to shift responsibility to a different location (e.g., external, vendor, or partner)?

Areas of Development, Opportunities, Perceived Needs

What are areas of new development, or opportunities, within the scope of digital scholarship described above, that you/your group has identified? How did you identify them? Are you working on them, or are you scheduled to work them? Are there constraints or barriers that make it difficult to either identify, or to act on these development areas?

Assessment

What information do you collect about your work? Are you asked to demonstrate any particular outcomes, or impacts that arise from your work?

Sustainability

How is the sustainability of your work in this area supported? What are the challenges to its sustainability?

Successes, Challenges, Future Plans

What are some things that you think have been most successful about your work in this area?

What are some challenges you have faced, or are facing?

What are some near term goals for your group in this area? Longer-term goals? What would your work in this area look like in your “ideal world”, if you didn’t have to consider any existing constraints or barriers?

Questions for Peer Libraries Working in Digital Scholarship Support

Note: For the purposes of this interview, “Digital scholarship” includes the use of digital tools, data, methods, authoring, publishing, and stewardship to support teaching and research.

Structure

Describe, in general terms, your library’s support of digital scholarship.

How is the support situated internally in your organization?

How many FTE staff have a primary responsibility to support digital scholarship? What are their roles? Are student staff members given primary responsibilities?

Do others in the library have a secondary role, for example liaisons, subject specialists, information technology staff? (*Would also be good to know FTE in the library, and number of faculty/students at the institution*)

Do you partner with other groups to offer this support? For example with a department, institute, or other unit outside of the library? If so, what are the specifics of the partnership?

How is the support presented *externally*, for example, a branded unit(s), a physical place, other specific resources, etc.? How do you communicate your work and engage with your audiences?

Areas of Focus

Do you have defined areas of focus and/or expertise around digital scholarship? How did you determine those?

Are there other groups/units/resources on your campus that provide similar support, or do similar work? If so, have you oriented your resources to compliment, or fill gaps, with those?

When considering areas of focus, did (or do) your existing staff knowledge and skills support those, and if not, how did (or do) you address the gaps?

Are there specific software tools, platforms, or other technologies that you have committed to support? What are they? How do you handle requests or needs for other tools and technologies?

Is space an important resource for your support of digital scholarship? If so, please describe the space(s) and its uses.

Users

Who are your users/collaborators? (For example, Faculty, Grad Students, Undergraduates, other University affiliates, non-affiliates.)

Do you have statistics on usage, or a rough sense of how much use (and if possible per group)?

Work

How is specific work in support of digital scholarship agreed-upon and scheduled? What forms does it take?

How do you determine your capacity for work, particularly when collaborating with or supporting people external to the library? Is capacity a concern?

Do you have any formal structures for relationships, either people- or project-based? For example, fellowships, "call for projects", small-grant awards, class relationships, etc. Are these structures designed to meet different levels of need / commitment?

Do the staff who support digital scholarship have their own projects/work that they do alongside or in-between collaborative work? (This could be personal, or on behalf of the library's own projects/programs)

Do you apply any form of assessment to your work? What information do you collect about your work? Are you asked to demonstrate any particular outcomes, or impacts that arise from your work?

Successes, Challenges, Future Plans

What are some things that you think have been most successful about your work in this area?

What are some challenges you have faced, or are facing?

What are some near term goals for your group in this area? Longer-term goals?

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