

White Paper: Envisioning Freedman Center 2.0:
*Campus Partnerships to Advance Faculty and Student E-Research
Through the Freedman Center for Digital Scholarship Center
at Case Western Reserve University*
Draft 1.1 for Comment 13 May 2013

Introduction

Digital scholarship (or e-research) extends traditional methods of research by applying new technologies (such as GIS data, visualization, and big data) to advance the research and educational processes. Digital scholarship is applicable to all disciplines, and it often involves interdisciplinary and global collaborations.

Support for digital scholarship is a key example of how libraries and partner organizations on campus nationally are evolving to bring technology and research together to meet a dynamic new platform in the integration of the 21st century. The CWRU libraries have been and remain strongly committed to partnering with the College, the Schools, ITS and other campus partners to support research and scholarship by adapting our services, resources and spaces to adjust to the changing academic requirements.

Just as the term e-business became just everyday business, digital scholarship will eventually become synonymous with much of scholarly research in the future. Today, the terms “e-research” and “digital scholarship” help to identify tools, technologies and services that enhance and expand the methodologies that are endemic to traditional (or analog) scholarship. The challenge will be to engage scholars so we can understand the research process from the perspective of the researcher, and to integrate digital scholarship in ways in which it may add value as seamlessly as possible.

The goal of this white paper is to demonstrate the potential for how the Freedman Center for Digital Scholarship can serve as a campus hub to work with partners to understand and support the research process, and to expedite the research process so scholars can generate and share their research optimally. This paper attempts to serve multiple purposes:

- to begin to define some key needs of faculty and student researchers in the e-research process
- to define the possible coordination and integration of service providers so that services are provided to scholars as seamlessly as possible
- to define the specific roles that the library may play in this evolving world of digital scholarship

Vision: The Role of Campus Partners and the Library as Service Providers

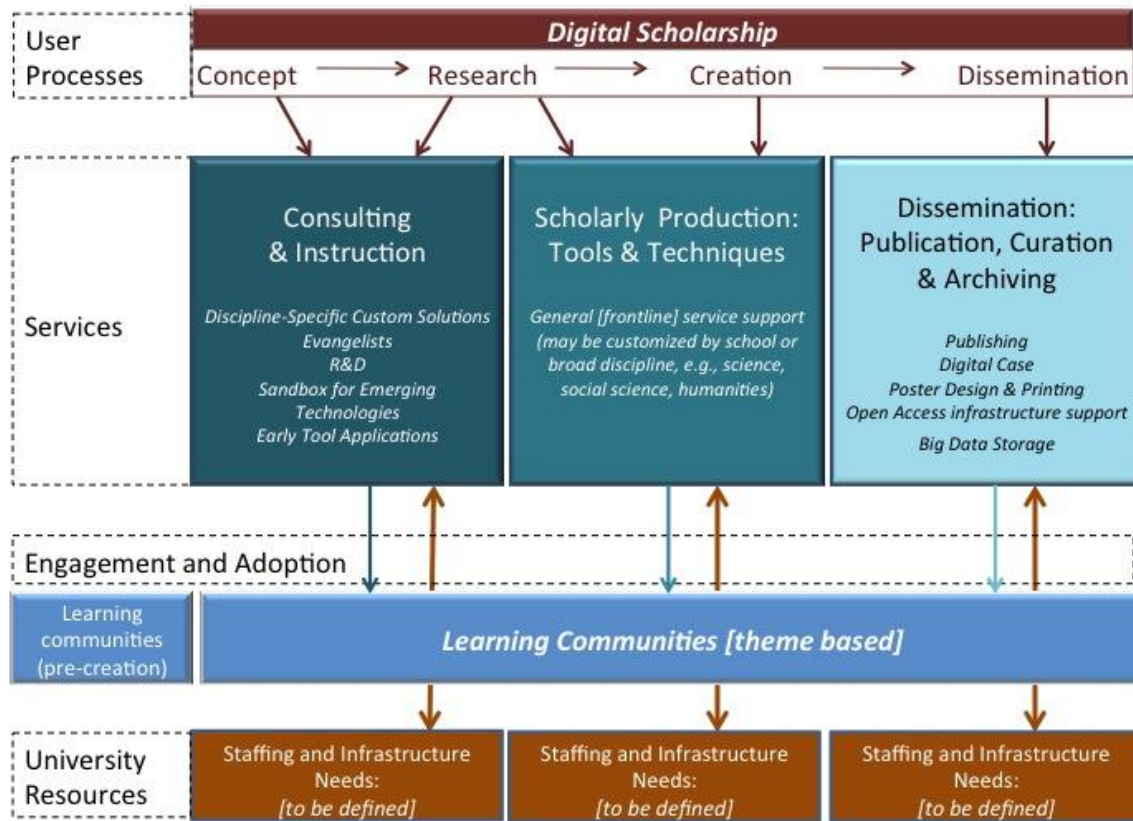
Given the many aspects of digital scholarship, campus support for it cannot be the sole purview of any one organization on campus. Expertise resides in many organizations on campus, and must be effectively harnessed so that researchers receive the best service without having to navigate through a sea of services, and the University can realize strongly effective services that minimize duplication of effort. To achieve this end, effective support will require a coordinated effort of the Kelvin Smith Library, the College (particularly through the Baker-Nord Center), the Schools, ITS, think[box], UCITE, the Office for Research, and other campus partners. Working together, we can develop collaborative services, resources and spaces that are agile and flexible enough to adjust to the changing academic requirements.

The work of the partner organizations will adhere closely to the digital scholarship process itself, i.e., we will help faculty and students move through the process from concept to research, from research to creation, and from creation to dissemination and data curation. The libraries are a logical physical and virtual hub for much of this digital scholarship service activity. Working with the many campus partners, we will integrate services in support of three key roles that are inextricably linked within this process.

1. **Education and Customized Consultation.** At the beginning of the research process, the partners will provide general education for members of the academic community on a wide range of issues (such as data management and intellectual property). As a faculty or student research project progresses, the libraries work collaboratively with faculty and students to provide customized consultation to develop appropriate digital scholarship methodologies, techniques, and media resources that can be delivered live or virtually, whether on campus or internationally. This expertise currently resides in multiple organizations on campus, and some additional expertise must be secured collaboratively to enable deeper and richer levels of research.
2. **Scholarly Production.** Throughout the process, we must work with faculty and students to clarify research topics, resources, techniques and tools, and recommend potential digital scholarship solutions. In particular, the library can provide specialized support, such as for geospatial and statistical data analysis, data visualization and manipulation, 3D printing, discipline-specific expertise, multimedia design and production employing new media, and digitization of information, digital text encoding and metadata generation.
3. **Dissemination: Publication, Curation & Archiving.** Specialized services and tools are essential for data and database management. There is a large role and responsibility that begins with the storage and retrieval of Big Data on a breadth and scale that we have not witnessed heretofore. The Library can bring particular expertise to bear through Digital Case 2 and other efforts to curate data that will ensure permanent accessibility to data generated by CWRU researchers in ways that adhere to the standards required by NIH, NSF and other grant agency mandates.

This research process, and the potential services that the Library and campus partners can provide, is illustrated at the top of the next page.

VISUALIZATION OF THE DIGITAL RESEARCH PROCESS AND SERVICE SUPPORT

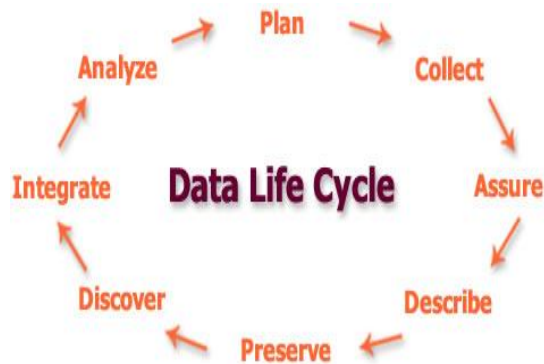


The CWRU libraries are currently supporting elements of digital scholarship but on a smaller, non-comprehensive, and not fully integrated scale. Past successes include programs such as the Freedman Fellows that support faculty e-research projects. The projects of the 2012 Fellows included:

- creating a database for Dr. Stephen Hefling's (Music Department) *Mahler Manuscripts Catalog*
- developing digital maps for Dr. Brian Gran's (Sociology Department) child trafficking monitoring project
- transitioning the History Department's Dr. John Grabowski's *Encyclopedia of Cleveland History* to a new content management system.

This sample of diverse projects demonstrates that there is already faculty interest and engagement in digital scholarship, for which the Kelvin Smith Library has provided support. The types of scholarship that we can support on a larger scale will require more resources to enable the provision of a greater breadth and depth of expertise that can be achieved through extensive campus partnerships. Ultimately the menu of services and the level of staff expertise needs to be greatly expanded to equal the quality and quantity of research happening on campus.

Support at All Stages of the Research Lifecycle



To optimize the level of services available to faculty and students, the digital scholarship partners must be involved and provide throughout the entire research lifecycle. The scenarios in the sidebars below illustrate the possibilities for the Freedman Center for Digital Scholarship to support faculty projects at various stages of their scholarly research projects.

Beginning: Education and Consultation

Faculty engagement with the Freedman Center into the research process can never begin too early. As faculty and students formulate ideas for their research projects, the Freedman Center staff can assist with that planning process through consultation where faculty can:

- learn about similar projects;
- meet with other faculty and departments doing related or similar research (related either through technology use or subject domain); and,
- learn about how their research could be turned into digital deliverables that will help to expand or speed their research, communicate and understand the outcome of the project.

Through such consultation, faculty could gain new insights and better plan their projects in ways that would not only save time and effort, but would enable faculty to make better use of the tools and technologies.

Through this planning process, faculty and students involved could also attend a series of workshops and educational sessions to help those involved with the project better understand the concepts and tools that would be necessary throughout.

As a project progresses, the Freedman Center can continue to assist researchers by providing the technological facilities necessary, such as for digitizing analog materials, creating and modifying existing digital media, and gaining access to a suite of specialized software for data analysis and visualization.

Scenario: Education and Consulting

A faculty member has a series of music scores that need to be captured, described, and made available online for others to use. Through preliminary consultation intake with a digital scholarship post-doc, the Freedman Center staff gain an understanding of the services the faculty member may require, including the types of metadata that will need to be captured. A digital scholarship research plan is developed that indicates the services that the Freedman Center will provide a list of the experts who will participate in the execution of the plan. For example, the plan might include recommendations to do the following.

- In consultation with a metadata librarian, the researcher could learn about how to employ cataloging techniques to enable cross-referencing of the metadata options.
- Through library-provided courses on database design, the researcher could gain valuable information about how best to enter and store structured data, Library staff also assist in creating the prototype databases and work with the researcher to explain the indexing, search and retrieval structures and methods that will be essential later to extract information essential to the research project.
- Specification could be created for a website and database to scope the cost of the project and identify potential funding for the creation of the final product,
- Development partners from ITS could assist to develop specialized software to support the specialized nature of this database, and to identify potential vendors outside the University that may be interested in partnering on this project.

The Digital Scholarship service partners could also provide their services through the Freedman Center as a “one stop shop” for e-research support. For example, the Freedman Center staff could coordinate service provision at each stage of the project and identify and engage partners to assist scholars as necessary.

Mid-Project: Scholarly Production

Projects at any stage can benefit from services offered at the Freedman Center for Digital Scholarship, even if the scholar had not consulted the Center earlier. Through a discussion with subject and technical experts, staff and partners of the Center can help focus the intent of a project and provide guidance on how the results of the research might best be communicated. For example, the scholar may have begun collecting data without consulting the Freedman Center, but later discovers that the format of data collection is no longer adequate, or that the database has quickly outgrown its original expected dimensions and a transition plan to a more robust solution is now essential.

The Scholarly Production phase involves the following key processes:

- Investigation. Staff will work with faculty and students to clarify research topics, resources, techniques and tools, and recommend potential digital scholarship solutions (such as the best means to digitize audio, video, images, or data)
- Data Analysis. Center staff will assist faculty and students in locating appropriate geospatial and other data sets, and in the creation, management and analysis of geospatial and statistical data.
- Multimedia Design and Production. As appropriate to the research project, staff will recommend and assist scholars to employ new media.
- Digitization and Digital Text Encoding. The Center will provide services for the digitization of information and text-encoding and metadata services to enable robust searching and retrieval of digital information.

Advanced Stage: Dissemination Through Publication, Curation & Archiving

The services of the Freedman Center continue through the advanced stages of projects to ensure effective dissemination of the research, and curation and preservation of both the database and the published versions of the scholar’s research in Digital Case, the University’s digital repository. Having completed the research and writing, researchers can obtain assistance in creating access and discovery systems that would enable the sharing of the research among scholars around the world by making the research data and results accessible for reuse and analysis. Examples of other services the Freedman Center can coordinate on behalf of the partner service providers include:

- information about potential publication in high impact open access publications
- advice on the use of a Creative Commons license to retain intellectual property rights for an article;

Scenario: Scholarly Production

A faculty scholar is doing a study on the health effects of altitude. Throughout the process has been collecting large amounts of data in Excel. As years passed, the number of spreadsheets has grown, as has the need to share the effort of data collection and input.

Approaching the Freedman Center can result not only in the proposing and prototyping of a new and scalable database structure, but also in options for making the database accessible to scholars on an international basis.

By working through the Freedman Center, campus partners, can be identified in the College and ITS and Schools to ensure effective long-term storage of the basic data and a retrieval mechanism. Through such an engagement other uses of this data may be identified that could further enhance the research, findings and communication of the results.

- how to secure copyright permission for quotation in a publication;
- methods to communicate research results by employing enriched techniques, such as data visualization or video production; and,
- preparation of a MOOC to share the results of the research on a massive global scale.

To assist faculty and students with their needs, the Freedman Center needs to be a hub of activity that provides the following services:

- Dissemination of Results. Staff will assist in the use of new media and other knowledge creation and management systems, such as poster creation, website design, archiving on Digital Case 2, and preparation for publication in scholarly journals.
- Data Management. Seek solutions internally (the Library) and externally (ITS, Schools, Colleges) for both short-term storage and permanent archiving and data management of digital scholarly data (whether the data resides on CWRU servers or in the cloud) will encompass at least three types of services: (a) *archival data storage* (e.g., storage of data generated by CWRU researchers following the standards established under NIH, NSF and other grant agency mandates); (b) *data staging* (e.g., short term staging of small and medium size datasets for relocation to a national or international research community-based archive, including the creation and publishing of data and its description and cataloging, and (c) *life-cycle data management* to ensure perpetual archiving and retrievability of data (especially “big data”) that was created as part of the research process.

Scenario: Dissemination, Curation, Archiving

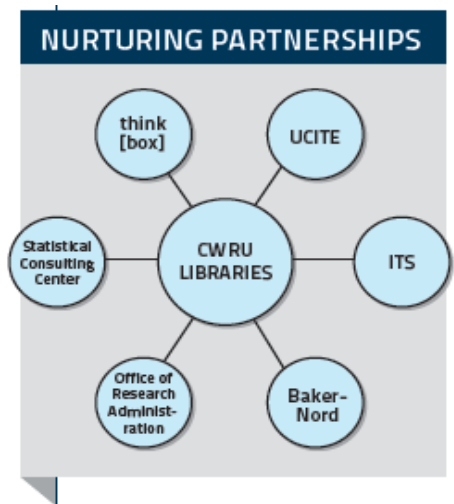
A physics student has an established corpus of data and that employed 3D visualization techniques to discover new properties of molecules and their behaviors. The student may consider this to be her final product. However, through engagement with the Freedman Center she can take this project a step further by working with tools and in-house visualization expertise to generate a “production-worthy” experience from the project. This will provide a refinement of the data not revealed using the original core working tools that were built and used for this project. As a result, the student produces a promotional video that documents her findings in brief, thereby providing greater exposure of her research and increasing the reputation of the

Faculty and student research is ever-expanding, and so the spaces, equipment and services necessary to support digital scholarship must always be flexible and responsive to change. A critical goal for the Freedman Center is to meet the needs of faculty and students at their point of faculty need. By looking through the lens of the research process, the Freedman Center can work to more seamlessly adapt and integrate its services to meet the needs of our ever-changing research & technology landscape.

Essential Resources to Advance Digital Scholarship

Digital scholarship thrives in a culture of collaboration. Existing staffing and partnerships provide a strong foundation for building this culture upon the work of the Freedman Center for Digital Scholarship, the Baker-Nord Center for Digital Humanities, Information Technology Services (ITS), UCITE, the Statistical Counseling Center, think[box], etc. By re- envisioning the Center as a place where faculty and students can meet and work with each other and partner service providers, it will be possible for digital scholarship produced at CWRU to have a global reach.

The Library, in with other University partners, must provide a range of services to support all aspects of e-research. As a centrally located and all-University service provider, ***the Freedman Center for Digital Scholarship is well-positioned to provide a unifying structure and serve as the incubator and hub of campus activity that supports the University’s strategic directions in research, innovation and academic excellence*** by doing the following.



The Freedman Center as Incubator. The Freedman Center should stimulate and sustain innovation at CWRU by connecting people—physically and virtually. As faculty and students generate new ideas, they will need facilities that foster their investigation and experimentation. As the campus facilitator of this work, the Freedman Center should serve as the hub to connect faculty and students with the tools and services they need to develop their ideas and to stimulate and sustain innovation.

- Grow Big Data and Enable Team-Based Research. Big Data becomes unwieldy and requires proper formatting, description, metadata, tagging, preservation, and user interfaces to make the data usable. Researchers neither have the time nor expertise to manage this important enterprise. Through the Freedman Center, the campus partners can assist in the process of integrating varied datasets from multiple sources, cataloging datasets, etc. In collaboration with IT professionals, the Freedman Center should also develop long-term storage and access solutions.
- Provide Effective Shared Services. A recent and thorough investigation conducted by the Kelvin Smith Library and University Information Technology Services concerning campus e-research services and partnerships identified vast gaps in services across the campus. Additional resources are essential for the libraries to relieve faculty frustration, to provide proper support, to eliminate fragmentation and duplicative efforts and inadequate and inconsistent data systems. These new services would best be provided on a coordinated federation of services provided by appropriate campus departments and operations.

The additional resources necessary to support digital scholarship fit within three categories: (1) staffing; (2) technology, and (3) facilities.

1. **Staffing.** Traditionally, the Kelvin Smith Library has provided the University community with robust research support (such as expert subject librarians to metadata specialists). Therefore, the Library is well prepared to transfer this expertise into the digital world of scholarship. However, to meet the requirements of a fully engaged support faculty and student community, additional and dedicated support is required.

At present, the staffing of the Freedman Center for Digital Scholarship is barely able to support the existing demand without any outreach or marketing efforts. As described in greater detail below, increased staffing support is required campus-wide related to digital scholarship. The Library alone identified the need for at least five new professional staff, two new support staff positions, and three new postdoc fellows. To this must be added staffing and expertise that is also required within ITS, the College and the Schools.

The Freedman Center and the partner organizations must expand the available talent pool with additional staff who have cutting-edge knowledge of how to apply digital scholarship approaches to the research topics being explored at CWRU. Ideally, this enriched staffing would comprise both some post-docs and some permanent full-time staff. These individuals will need to possess the necessary expertise to understand in depth the nature of the research in which faculty are engaged, while also being able to bring to bear new digital tools and processes necessary to analyze and understand research results.

The support for this intensive research, there will be a need for the partners of the Freedman Center to pool their resources and collaborate to minimize duplication of effort. At least two distinct types of deep expertise will need to be resident on campus:

- a. Discipline-based scholars who understand the research being performed and are proficient in digital scholarship, such as a practicing digital humanities specialist, a digital social science specialist, a digital e-science specialist).

- b. Technology and research specialists, who might build upon the “technical research services” concept currently available from the current Freedman Center for Statistics & Geospatial Data Office. Additional offices that will be vital to the enterprise might include ones to support scholarly communications, data visualization, textual analysis, and data management.

These experts are essential to provide the education and consultative services for which there will be an increasing demand within the next five years. Class-based sessions can provide basic-to-advanced skill and knowledge building that promote the use of digital tools and multimedia in research and academic curriculum. For the past two years, the Freedman Center has coordinated a yearly Colloquium that has been co-sponsored by the College of Arts and Sciences and Information Technology Services. The Colloquium highlights the digital scholarship projects happening on campus and around the world, and provides best practices and highlighting different tools and techniques for doing research.

In addition, the Library has also long provided such instruction through the CaseLearns program, which includes popular courses on topics such as new media production and editing. Additional courses are currently being developed to support areas of GIS, scholarly communication, statistics, databases, principle digitization practices, and exploring tools and “best practices” for digital projects. Such educational services should be supplemented with customized consultation so that a faculty member or student who has already taken a class can gain further understanding of how to connect the tools available to the specific needs of a project.

2. **Technology.** When a researcher is ready to begin the production process, the Freedman Center continues its engagement through providing technology for the wide range of scholarly endeavors happening on campus, from digitizing old maps to creating 3D models for visualizing molecular behaviors. Whether production is happening in the Library or not, often it will require the expertise of Freedman Center staff and partners to use these tools effectively and to offer skillful guidance on how best to incorporate products into the research process.

Thanks in large measure to significant external funding provided by the Freedman family over the years, it has been possible to provide the campus with a wide array of digital production equipment, from image scanners to video editing. Within the past two years, the Kelvin Smith Library and Information Technology Services have collaborated to introduce digital services of importance to the campus, including installation of the Active Collaboration Room, a visualization wall, and creation of expanded learning and research spaces. These have been important developments, but these are not once-and-done. The advancement of digital scholarship will require a host of new technologies, including expanded visualization technologies, big data storage, etc. This will require an expanded and continuous university investment of funds.

Digital Case 2. A backbone technology for e-research is Digital Case, the digital repository of the University. When introduced, Digital Case was a pioneer that helped to establish a standard for making digital content secure and accessible. Currently, plans are underway to re-engineer Digital Case entirely to serve today’s modern scholarship endeavors. It will continue to provide secure and reliable storage of data, but greater focus will be placed on discoverability of content and improvements in data curation and preservation. Digital Case 2 will also serve to be a natural complement to the physical collections, particularly that of the Library Special Collections. Among the advancements that are envisioned for Digital Case 2 are the following:

- a flexible repository (Fedora);
- a dynamic and usable front end (Hydra);
- a solid self-service submission process;
- robust search and browsing capacities;
- multiple views for content (by subject, format, etc.);

- enabling of user tagging and crowdsourcing;
- user-created collections; and
- support for both open and local access collections.

Visualization. Visualization is another exciting new way to experience, understand and share research output. The University has already made inroads into this area through the visualization wall located within the expanded Freedman Center space. Support for visualization must be expanded, and its relevance to many disciplines in addition to the hard sciences needs to be explored. There must also be multiple options for visualization so that those who do not require high-performance computing can have an approachable and workable system that enables large-scale visualization without requiring constant technical support.

Big Data. Probably the most important topic in today's digital scholarship realm lies within big data. With mandates by major grant funding agencies (such as NIH) to provide a data management and archiving plan in applying for grants, most researchers need to start being more mindful of data storage and availability. The Freedman Center for Digital Scholarship must be prepared to support this process through assisting with the creation of plans, identifying storage tools, and enabling continuous data access. Digital Case is an ideal destination for such data, yet discipline-specific repositories exist that are also great destinations to consider, with the Freedman Center providing guidance on which locations would be best for depositing the data.

3. **Facilities.** As part of the recent gift from the Freedman family, the Kelvin Smith Library has some funds to redesign the 2,700 square foot space that has housed the Freedman Center over the past seven years. More recently, the Library has begun to expand the borders of the Freedman Center beyond the bounds of the glass walls, including the movement of some scanners to the open floor and to transition some services (such as the lending of basic audiovisual equipment) to the general Service Center.

The vision of this white paper is to provide a comprehensive set of research process-based services for which the Freedman Center for Digital Scholarship can serve as a physical home for all of the campus services that are interested in collaborating in providing this wide array of educational, consultative and production services. To implement this vision, it is essential to re-conceptualize the current spaces and to develop new spaces that support this full research lifecycle. Production will remain as a significant component, with the specialized hardware and software, such as scanners, digitization tools, large format and 3D printers, high-end audio and video production suites, and possibly a sound studio. Equally, if not more important, the Freedman Center must provide optimized spaces for the educational and consultative services that are at the heart of digital scholarship.

Conclusion

The Freedman Center must provide as a proportional mix of space, people, and technologies to create an experience and environment in which faculty and students can engage in advanced e-research. This document attempts to serve as a roadmap to describe where we are and where we hope to be. Most importantly, this white paper is intended to stimulate the *beginning* of a process by which we hope to engage the University community in a dialog as to the services that will be needed, and the best means to achieve these goals.

Once there is agreement among campus partners and the community about the services, some of the next steps might be as follows:

1. Conduct an inventory of skill sets and expertise among partners, analyze potential gaps, and work with partners to identify means to fill unmet needs.

2. For all services articulated, define specific modalities for service and identify the roles for each of the partners.
3. Create success metrics for all services and continuously monitor levels of success. In this regard, success generally will be achieved if there is:
 - strong collaboration among campus partners to make available enriched, effective and efficient expertise for faculty and students;
 - significantly increased breadth and depth of services to support the full range of digital scholarship services;
 - substantially greater understanding by the campus community of the services that are available through the Freedman Center for Digital Scholarship;
 - an enhanced national and international reputation of CWRU as a leader in support of digital scholarship; and
 - strengthened ability of the University to attract external foundation, grant and individual donor support as a leader in support of the application of leading-edge digital technologies.