

A Survey of Digital Humanities Centers in the United States

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By

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During the period in which this survey was conducted, the directors of two of the digital humanities centers who participated in this study passed away. The legacy of Roy Rosenzweig (Center for History and New Media at George Mason University) and Ross Scaife (Collaboratory for Research in Computing for the Humanities at the University of Kentucky) continues through their centers.

Executive Summary

In preparation for the 2008 Scholarly Communications Institute (SCI 6) entitled, “Centers of Excellence: Models and Strategies for Creation and Advancement,” the Council on Library and Information Resources (CLIR) commissioned a survey of digital humanities centers (DHCs). The immediate goals of the survey were to identify the extent of these centers, and explore their financing, organizational structure, products, services and sustainability. The longer-term goal is to provide participants of SCI 6 with a greater understanding of existing centers to inform their discussions about regional and national centers. The year-long study took place in two phases: an initial planning phase to develop selection criteria, identify candidates, and plan methodology, and an implementation phase to conduct the survey and analysis of the centers.

Thirty-two organizations took part in the survey, which was conducted through interviews with senior management, and Web site and literature reviews. The results show that digital humanities centers can be grouped into two general categories:

1. Center-focused: Centers organized around a physical location, with *many* diverse projects, programs and activities undertaken by faculty, researchers, and students, and which offer different resources to diverse audiences. The majority of centers operate under this model.
2. Resource-focused: Centers organized around a primary resource, located in a virtual space, that serve a specific group of members. All programs and products flow from the resource, and individual and institutional members help sustain the resource by providing content, labor, or other support services.

The findings also show that DHCs are entering a new phase of organizational maturity, with concomitant changes in activities, roles, and sustainability. Of late, there is a growing interest in fostering greater communication among centers to leverage their numbers for advocacy efforts. However, few DHCs have considered whether an unfettered proliferation of individual centers is an appropriate model for advancing humanities scholarship. Indeed, there are some features in the current landscape of centers that may inadvertently hinder wider research and scholarship:

1. The silo-like nature of current centers is creating untethered digital production that is detrimental to the needs of humanities scholarship. Today’s centers favor individual projects that address specialized research interests. These projects are rarely integrated into larger digital resources that would make them more widely known and available for the research community. As a result, they receive little exposure outside their center, and are at greater risk of being orphaned over time.
2. The independent nature of existing centers does not effectively leverage resources community-wide. Centers have overlapping agendas and activities, particularly in training, digitization of collections, and metadata development. Redundant activities across centers are an inefficient use of the scarce resources available to the humanities community.
3. Large-scale, coordinated efforts to address the “big” issues in building humanities cyberinfrastructure (such as repositories that enable long-term access to the centers’ digital production) are missing from the current landscape. Collaborations among existing centers

are small and focus on individual partner interests that do not scale up to address community-wide needs.

The findings of this survey suggest that new models *are* needed for large-scale cyberinfrastructure projects, for cross-disciplinary research that cuts a wide swathe across the humanities, and for integrating the huge amounts of digital production already available. Current DHCs will continue to have an important role to play, but that role needs to be clarified in the context of the broader models that emerge.

When investigating collaborative models for humanities scholarship, the sciences offer an important framework for consideration. Their large-scale collaborations have been the subject of research that examines the organizational structures and behaviors of these entities and identifies the criteria needed to ensure their success. The humanities should look to this work as it plans its own strategies for regional or national models of collaboration.

I. Introduction - Project Background and Goals

In preparation for the 2008 Scholarly Communications Institute (SCI 6) entitled, “‘Centers of Excellence’: Models and Strategies for Creation and Advancement,”¹ the Council on Library and Information Resources (CLIR) commissioned a survey of digital humanities centers (DHCs). The immediate goals of the survey were to identify the extent of these centers, and explore their financing, organizational structure, products, services and sustainability. The longer-term goal is to provide participants of SCI 6 with a greater understanding of existing centers to inform their discussions about regional and national centers.

The program description for SCI 6 notes:

While it is necessary to more clearly define the notion and characteristics of such national centers, there is a danger in doing it too soon, in letting current and past models structure the future. ... the discussion and options for centers [should remain] open until the scholarly community has had ample opportunity to identify and consider various models.²

The CLIR survey contributes to this discussion by providing information on current DHC models, their benefits and limitations, and the range and reach of DHC activities. With this baseline information, SCI participants can consider whether current models are addressing the changing nature of humanities scholarship or whether new models are needed.

The CLIR survey also explores the collaborative aspect of existing models. As digital humanities computing becomes an integrative, multi-team endeavor, the motivations, support structures, and reward systems that make for successful collaboration become critically important. Survey participants were asked about their experiences forming and sustaining partnerships, consortia, and other joint efforts to gauge the role of collaboration in the operations of these centers and to highlight aspects of collaboration that may be critical to the success of regional or national centers.

II. Selection of Survey Participants

This study was conducted in two phases from June 2007 through May 2008. During the Phase I planning stage, a working definition of a digital humanities center was developed and used to select survey candidates, and a questionnaire and methodology (see Section III) were devised to map out a strategy for conducting the survey.

A. Defining a Digital Humanities Center (DHC)

Because digital humanities centers are self-defined entities that exhibit a variety of characteristics and conduct a wide range of activities, it can be difficult to compare them in any

¹See <http://www.uvasci.org/current-institute/>.

²Scholarly Communications Institute 6 (SCI 6) *Focus: National Centers of Excellence: Models and Strategies for Creation and Advancement*. July 13-15, 2008, University of Virginia, Charlottesville, VA. <http://scinews.files.wordpress.com/2007/07/sci-6-program-descr-7-06-07.pdf>

meaningful fashion. To select a pool of comparable survey participants from these highly variable organizations, a working definition and selection criteria were developed to guide the selection process.

The working definition was developed after examining several dozen organizations that define themselves as DHCs (or have been defined by others as such) to identify their mission and the range of activities that fall under their purview. In crafting this definition, the following assumptions were made:

- A “center” implies a central (physical and/or virtual) area where a suite of activities are conducted by individuals dedicated to a common mission.
- “Digital humanities” implies humanities-based research, teaching, and intellectual engagement conducted with digital technologies and resources. The use of these technologies may be prosaic (e.g., using new media to conduct humanities research or enhance teaching) or transformative (e.g., creating wholly new products and processes that transform existing knowledge and create new scholarship).

Working from these assumptions, and from knowledge of the vast array of activities undertaken by DHCs, the following working definition was developed:

A digital humanities center is an entity where new media and technologies are used for humanities-based research, teaching, and intellectual engagement and experimentation. The goals of the center are to further humanities scholarship, create new forms of knowledge, and explore technology’s impact on humanities-based disciplines. To accomplish these goals, a digital humanities center undertakes some or all of the following activities:

- Builds digital collections as scholarly or teaching resources
- Creates tools for:
 - authoring (i.e., creating multimedia products and applications with minimal technical knowledge or training)
 - building digital collections
 - analyzing humanities collections, data, or research processes
 - managing the research process
- Uses “digital collections and analytical tools to generate new intellectual products”³
- Offers digital humanities training (in the form of workshops, courses, academic degree programs, postgraduate and faculty training, fellowships, and internships)

³American Council of Learned Societies, *Our Cultural Commonwealth: The final report of the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities & Social Sciences*, December 13, 2006, 7, <http://www.acls.org/cyberinfrastructure/OurCulturalCommonwealth.pdf>.

- Offers lectures, programs, conferences, or seminars on digital humanities topics for general or academic audiences
- Has its own academic appointments and staffing (i.e., staffing does not rely solely on faculty located in another academic department)
- Provides collegial support for, and collaboration with, members of other academic departments at the DHC’s home institution (e.g., offers free or fee-based consultation services; enters into collaborative projects with other campus departments)
- Provides collegial support for, and collaboration with, members of other academic departments, organizations, or projects *outside* the DHC’s home institution (e.g., offers free or fee-based consultation to outside groups; enters into collaborative projects with external groups)
- Conducts research in humanities and humanities computing (digital scholarship)
- Creates a “zone of experimentation and innovation” for humanists⁴
- Serves as an information portal for a particular humanities discipline
- Serves as a repository for humanities-based digital collections (e.g., Web sites, electronic text projects, QuickTime movie clips, etc.)
- Provides technology solutions to humanities departments (e.g., serves an IT role for humanities departments).

B. Identifying and Selecting Survey Participants

Dozens of survey candidates were identified from a variety of sources (see Appendix A for a list of sources consulted.) Several criteria were used to cull a usable sample from these candidates. Only U.S.-based DHCs were considered because of time and logistical constraints.⁵ In addition, the following groups were excluded from consideration:

- Digital projects. While DHCs often develop and support digital projects, projects developed and supported by entrepreneurial individuals *independent* of the auspices of a center were excluded from consideration.⁶

⁴James O’Connell, Provost at Georgetown University, used this phrase (at an ACLS Commission on Cyberinfrastructure Public Information Gathering session) to describe an unquantifiable, albeit critical, aspect of digital humanities centers.

⁵ U.S.-based organizations with international partners were *not* excluded.

⁶The distinction between a digital project and a DHC is best understood by a comparison. The *Baptisteria Sacra Index* (<http://www.library.utoronto.ca/bsi/>) is an example of an ambitious digital project developed by an art historian and librarian at the University of Toronto that offers an iconographic index of baptismal fonts from the early Christian Period to the 17th Century. By contrast, the *Women’s Writers Project* (<http://www.wwp.brown.edu/>) began as a digital project (a database of works by pre-

- Libraries, academic departments, or other institutions that function *solely* as repositories for digital humanities collections.
- Academic departments that offer a degree-granting program in digital humanities or related areas (such as digital media design or humanities informatics), but do not conduct any other activities (listed above) common to DHCs.
- Digital libraries (collections of digital resources) or digital library research centers (organizations that develop methods for scanning, ingesting, or otherwise moving print materials to digital form).

Although all these organizations, departments, and projects may be critical components of a humanities center, their singular focus excludes them from being considered a DHC under the working definition developed above.

After this initial culling, the remaining candidates were assessed using the working definition as a guideline. Organizations whose mission and goals were consistent with this definition and whose activities included four or more of the most frequent activities conducted by DHCs, were selected as final survey candidates. These organizations were contacted and asked to participate in the survey. In the end, 32 organizations agreed to take part (see Appendix B.)

III. Survey Methodology

A. Methodology

The survey methodology was influenced by the project timeframe, logistics, and the nature of information that was sought. The project had only a nine month timeframe (September 2007 to late May 2008) to contact and survey 32 geographically dispersed organizations, analyze the answers, and write up the results (Phase II.) The number of organizations was too great to conduct site visits within this limited period of time, but too small to assess successfully through traditional mail, email, or online surveys.⁷ In addition, many of the lines of inquiry proposed for the survey could not be answered in the succinct manner characteristic of the “questionnaire” format used in traditional mail (or email) methods. Questions about business models or collaborations, for example, require a level of discussion and follow-up questions that are not possible in self-administered survey instruments.

Given these factors, the most expedient method for conducting the survey was a two-pronged approach of: 1) gathering relevant information from DHC Web sites and publications and 2) conducting individual phone interviews with center directors (or their high level designates). This combined “review/interview” strategy made the best use of the project timeframe and of the

Victorian women writers), but has grown beyond its original intent and now functions as a DHC, offering training and tools for text encoding, collaborative projects, research and development in text mining and visualization, and more.)

⁷ Paper-based or online survey instruments (i.e., “Survey Monkey.com”) rely upon recipients being motivated to independently complete the survey. This method generally elicits low response rates and thus tends to be used only when there is a large sampling community (where a low return percentage can still yield a significant raw number of responses.)

directors' and interviewer's time. Because much of the background and operational information about DHCs can be obtained from their Web sites (and in many instances, from published articles, press releases, and other online resources), the phone interviews delved into issues that required focused and nuanced levels of discussion on topics typically not available through print or online resources (such as business models, or decision-making processes.) This strategy also helped prepare the interviewer, giving her background information (from the literature review stage) to draw upon during the phone interview.

B. A Note About Confidentiality and Reporting

Individuals who took part in the phone interviews on behalf of the centers were guaranteed confidentiality so as to encourage candid discussion. As a result, all findings are reported here anonymously or in aggregated fashion, *unless* the information was available in a publication or on the center's Web site.

Sometimes findings are reported in a generalized fashion (i.e., "many" or "most"), while in other instances more detail (such as number or percentage of centers) is given. The decision to report one way or another depended on the following factors:

Confidentiality. When specificity might inadvertently reveal the identity of a center (for example, when percentages were so skewed that it might be obvious to readers who the minority center was), the results were reported in a generalized fashion to preserve the anonymity of the center.

Complexity of answers. When questions that were presumed to yield "yes/no" answers proved to be more complex ("yes, but..."), results were reported in a generalized manner. Descriptions and/or examples are presented to illustrate the complicated nature of issues that yielded such responses.

C. Survey Areas

A number of factors influenced the survey topics and specific questions. Key considerations were the project's goals and the types of information that might be useful for the participants of SCI 6. The selection of topics was further influenced by discussions that took place during Phase I with various individuals about critical information areas that warranted exploration, and by a review of print and Web resources that explored issues in digital humanities computing and digital humanities centers. In the end, the survey focused on the following topical areas:

1. General Background Information
2. Governance
3. Administration
4. Operations
5. Sustainability
6. Partnerships and Collaborations

In each of these areas, a specific set of information was identified as critical to the understanding of issues or providing context. Questions were developed to derive this information, and a

template was created to guide the background research process and phone interviews (see Appendix C.)

IV. Findings

A. General Background

1. Physical and Virtual Locations

All the DHCs in the survey have physical and virtual locations, but some centers are more rooted to the “brick and mortar” than others because of the nature of their activities, operations, and governance, while others rely more heavily on the Web. Consortia and membership-based centers (such as HASTAC or MERLOT)⁸ operate largely through their virtual space because their members are geographically dispersed and can only gain access to primary resources in this manner. These centers’ facilities are used largely by the administrative and technical staff who manage the centers, but not by the members or partners.⁹

By contrast, university-based centers do not have the issue of dispersed memberships who need access to common resources because the centers’ primary partners (researchers, staff, and students) are located within physical proximity of each other. While activities take place in both the physical and virtual locations, the physical site is more than an administrative office or server location: it is the hub of the center’s activities.

2. Research Domains

Some DHCs address the full range of humanities disciplines, while others focus their efforts on particular humanities discipline(s) that form the core of their scholarly or pedagogical pursuits (e.g., design and culture in Islamic societies.) The research domains of the surveyed centers can be categorized as follows:

The Humanities (and beyond): Centers whose research domains encompass all of the humanities, and frequently the interstitial areas between the humanities, the social and natural sciences, the arts, and technology. Many are interested in crossing the boundaries of all these areas to address what one center characterized as “the big human questions.”

Discipline-specific: Centers that focus on *particular* disciplines within the humanities and/or social sciences, such as history, English, literature, art history, or architecture.

Humanities pedagogy: Centers concerned with teaching and instructional methods for learning in the humanities. These centers may have a specific disciplinary focus (e.g., teaching languages or history) or may explore aspects of pedagogy in digital environments (e.g., writing and literacy in new media environments.)

⁸ See “HASTAC” at <http://www.hastac.org/>; “MERLOT - About Us” at <http://taste.merlot.org/index.html>.

⁹This is not to suggest that *all* the activities take place in the virtual space. Consortial and membership DHCs do hold annual member meetings or events in a physical space, but the bulk of their operations and resources are online.

Experimentation: Centers that explore new methods of creativity or challenge existing notions about cultural products in a digital arena. These centers develop and nurture experimental or experiential activities in such areas as digital art and performance; the changing nature of literacy in a networked culture; or re-envisioning the book in a digital environment.

Although DHCs may emphasize one domain, it is the nature of the humanities enterprise that nearly all venture into other areas at some point in time. A center with a discipline-specific domain, for example, may incorporate pedagogical components into its projects (e.g., using technology to teach history.) Conversely, a center whose focus is multimedia literacy may explore this area within the context of an undergraduate course in Classics.

3. Founding Dates

The oldest center in the survey was founded in 1978; the most recent in 2005. (The mean year for the sample is 1992; the median and mode are 1999). However, founding dates are misleading because they are based on different definitions of what activity marks a center's inception. Some DHCs mark the founding date as the year they received research center status at their university (i.e., the equivalent of their "incorporation".) Others use the date of the first digital humanities project that set them on the trajectory towards becoming a full-fledged center. The date for the oldest center in the survey reflects its founding as a traditional humanities center (which now undertakes digital humanities initiatives).

4. Founding History

Digital humanities centers arise from a variety of different circumstances. Frequently, a single event launches a larger process that results in the formation of a center. One such event has been characterized as the "key discussion." Whether in the guise of a formal meeting or a casual conversation, many centers were formed because a faculty member discussed the idea with a receptive dean, provost, or outside funder who offered startup monies.

Grants have also been an impetus for the creation of centers, albeit in an indirect way. Many digital projects initially funded by grants often developed beyond their original intent, generating other projects and activities. Eventually a decision was made to organize all these activities under one formal structure (a "center") for greater strategic management.

Occasionally centers emerged from a campus-wide humanities or pedagogy initiative. These initiatives came from the highest administrative levels of the university (often the Office of the President), and included a DHC as one component of a broader strategy to promote the humanities on campus.

Some DHCs had their origins in computing service units within a university. Campus instructional technology centers or humanities computing facilities may have, over time, found themselves moving from a role as purveyors of technology services to incubators and managers of digital humanities projects. In time, their original purpose is subsumed by these other activities, and a restructuring occurs which acknowledges and sanctions their new role as a DHC.

The academic entrepreneur also plays a role in the startup of centers. HASTAC emerged in this way, as did the Perseus Digital Library. Equally important are the efforts of the prolific digital humanities scholar who initially organizes a center to meet his/her immediate needs but which, given the collaborative nature of digital humanities, organically grows to encompass the digital scholarship and research of others.

However, the reality behind the founding of DHCs is more complex than these circumstances imply. A grant, a strategic discussion, or an entrepreneurial individual may be a stimulus, but the process from idea to implementation is protracted and often occurs in an unstructured fashion rather than through any long range planning. It is fueled and sustained through continual fund-raising, wider efforts to solicit buy-in around campus, and greater reaches that move the idea in a step-wise progression from project (singular activity) to program (long-term activity) to center (multiplicity of activities).

5. Mission Statements

Convention dictates that mission statements should be short, jargon-free, and understandable by a lay reader. They also should address three questions:¹⁰

- 1) What is the organization's purpose?
- 2) How does it achieve this purpose?
- 3) What principles or values guide its work?

DHC mission statements do not always adhere to these guidelines, representing an eclectic mix of content, form, and varying levels of clarity. They all address the "purpose" of their organization (Question 1), and most include descriptions of how they accomplish their work (Question 2.) The principles or beliefs that guide DHCs (Question 3) were less frequently and less clearly expressed.

When examining the mission statements in detail, a wide-range of "purposes" (Question 1) are evident. DHCs want to:

- Create global communities of scholars, students, professionals, and the public engaged in humanities questions
- Share experience, resources, and dialogue
- Challenge or rethink traditional assumptions about learning, literacy, or print media
- Promote and advance disciplines, civic engagement, interdisciplinary research, creative uses of technology, and public understanding of humanities issues
- Explore the way digital technologies are changing scholarship, particularly in work processes and products

¹⁰Radtke, Janel M. 1998. "How to Write a Mission Statement," in. *Strategic Communications for Nonprofit Organizations*. Wiley & Sons. Also available at: <http://www.tgci.com/magazine/How%20to%20Write%20a%20Mission%20Statement.pdf>

- Harness digital technologies for scholarship, teaching, and public service
- Provide funding, infrastructure, and technical assistance needed for digital humanities to thrive
- Become environments for experimentation (such as incubators or “think tanks”) that develop scholarly or pedagogical work and foster emerging fields
- Gain greater efficiencies by leveraging infrastructure and expertise
- Create tools, digital content, standards, research approaches and methodologies, learning and development environments, projects, and global networked resources
- Bridge gaps between humanities, art, and scientific disciplines; pedagogy and technology; and technical innovation and humanities concerns
- Democratize and revitalize disciplines for diverse audiences
- Collaborate across disciplinary “divides” (e.g., humanists, artists, and social scientists with computer scientists, engineers)

The centers achieve these goals (Question 2) through the following activities:

- Providing resources (funding, staffing, tools, space, access to experts, publishing outlets) and support services (technical, grant writing, administrative)
- Offering opportunities for dialog (forums, lectures, presentations, events, conferences) and learning (courses, workshops, online training)
- Developing and managing projects and research agendas
- Offering collaborative, partnership, and community-building opportunities
- Creating services, applications, networks, digital collections and primary source materials
- Assessing technologies
- Conducting outreach (to faculty, researchers, students, teachers, general public)
- Consulting for the academy, industry, business and educational communities
- Serving as an intermediary for dispersed humanities’ activities
- Preserving digital materials

The principles and values that guide the centers' efforts (Question 3) were identified as:

The enduring value of the humanities, particularly faith in humanistic traditions and the importance of the liberal arts; belief that the humanities have a vital contribution to make in the contemporary world; and honoring the rich legacy of culture

Collaboration and cross-disciplinarity, particularly the importance of transcending divisions (between the arts, sciences and humanities; between the academy, industry, and culture; between practitioners and theorists) and the value of interdisciplinary research

Openness, in the form of the free flow of ideas; transparency in work and practice; a progressive intellectual property system; and greater access to source material for the study of the humanities

Civic and social responsibility, particularly developing a citizenry of critical thinkers; presenting a democratic understanding of the past; emphasizing the importance of historical, visual, and multimedia literacy; reaching out to the general public; working with poorly resourced partners (e.g., organizations in developing nations); and understanding the social and political consequences of digital technology use

Questioning "Sacred Cows" by rethinking traditions and challenging assumptions, and according equal value to both theory *and* practice in digital humanities.

6. Constituencies

DHCs serve six major categories of constituents:

- Members of the university community, such as faculty, students (undergraduate and graduate), postdoctoral and faculty fellows, and campus administrators
- The broader research and scholarly community outside of the DHC's university or parent institution, such as visiting researchers or international scholars
- The education community, including K-12 teachers and students, as well as university instructors. This community often is divided further by discipline (history, science, English teachers) or grade level (middle and high school teachers).
- Disciplines, professions, and professional interests, such as communities defined by discipline (classicists, linguists, historians), profession (artists, writers, or librarians) or mixed groups of professionals brought together by a common interest (e.g., architects, urban planners, designers and all others interested in the built environment).
- Corporate entities, such as cultural heritage institutions, research centers, international standards organizations, and business and industry
- General public and community groups

Some DHCs describe their respective constituencies broadly by their content focus (e.g., anyone who uses historical maps) or need (e.g., digital humanities practitioners who lack traditional support systems.) Others apply broader, more cerebral descriptions (e.g., those interested in exploring the discourse in electronic literature) because they have found their constituency to be so diverse that it defies standard categorization.

B. Governance

Twenty-nine of the DHCs covered in this survey are governed within a university infrastructure and two are independent organizations. An important distinction exists between how a center is governed and how it operates. Two of the university-governed centers *operate* as membership DHCs, i.e., they run a large digital repository of content for a special community of members who share a common interest in the resources of the repository. The members help in the operation of the center (for example, by contributing content, serving on committees and editorial boards that vet resources, managing projects, etc.) However, these centers are largely *governed* by universities, not by the membership. There are also centers under the leadership of their founders who operate in a university environment, and receive in-kind support in the form of infrastructure, but are overseen by the founders with little apparent governance by university administration.

With the exception of one independently governed DHC, all the centers surveyed are not-for-profit entities, or are housed within a larger nonprofit organization (e.g., a university.)

1. Reporting Structure/Place on Organizational Chart

The directors of DHCs under university governance most often report to an academic or administrative dean of a school, college, or division at the university. The next most frequent “direct report” is to a university vice president or provost, followed by the chair or faculty of the departments in which a center may be physically located. One center is unusual in that its director has no formal reporting line but instead has a number of informal reports to various deans, a primary funder, and the university president. Another reports to its university’s chief information officer. Among the DHCs who are independent organizations, one director reports to a board of trustees, the other to the center’s funders.

In reality, most DHCs often have primary, secondary and unofficial reporting lines. They may, for example, officially report to their department chair, and indirectly to the dean of their college. Those who report to a dean also may have a special reporting arrangement with the provost. Some centers split reporting between academic and administrative deans because the work of the center has financial or programmatic ties to both groups. A surprising number of centers have, in addition to their “formal” reporting requirements, loose or nominal arrangements of “courtesy” reporting to administrators and departments around campus.

For centers operating in a university environment, the actual location of the center on the university’s organizational chart is often determined by the circumstances of its origin. If a center was created within an academic department, it usually is located with that department on an organizational chart. If its genesis was among partnering faculty located in different

departments, it may be placed at a higher level, within a college or school/division. Multicampus units may fall under the Chancellor's Office of the university system or the Office of the President on the campus where the DHC physically resides.

Seven centers have been "relocated" on their university's organizational chart at some point in their history. Sometimes the change was brought about by the center's own growth: as the center thrived, it began encroaching too heavily upon the resources of its original home unit (an academic department, for example), and thus was moved under the administration of another, larger-resourced area of the university. In a few cases, centers were moved as part of a university-wide restructuring process.

Centers located in universities are referred to under many different administrative categories by their parent organization. They may be labeled a "program," "independent unit," or "unit" within a particular department; a "research program," "independent research center," or "organized research unit" within a particular school; a "research center/program/lab" and "center" at the university; or a "multicampus unit" in a state-wide university system. Interestingly, some DHCs can not be located from a search of their university's Web home page, nor can they be found on the pages of the site that list university departments, units and programs. Those that do appear on such lists usually are labeled as "research centers" or "research programs."

2. Ancillary Groups Involved in Governance

In addition to the individuals, departments, or schools who provide governance, DHCs often have ancillary groups that are involved in their oversight. These groups provide assistance in the form of advice or review, oversight of budgets and programs, or disciplinary expertise.

Ancillary governing groups go by many different names (e.g., advisory councils, steering committees, administrative boards) but perform duties in the following areas:

- Providing advice on planning, policy decisions, and "ad hoc" issues
- Serving on grant selection and review committees
- Fundraising
- Representing DHC programs around campus
- Reviewing programs, budgets, and progress on projects
- Providing feedback from faculty around campus
- Clarifying the DHC's mission and activities
- Brainstorming on new ideas, projects, and research areas

The groups may be convened on an ad hoc basis (the norm) or at regularly scheduled intervals. Members may be formally appointed to serve (by a dean or provost) or informally selected by the DHC director and staff. For official appointments, a DHC director may make recommendations to the senior official who is responsible for the appointments.

Individuals who serve on these groups often are selected on the basis of their involvement in the center (e.g., past partners; members; current staff.) However, it is equally common to find members with no prior center affiliation who are selected because they have the disciplinary expertise, financial acumen, or administrative experience that the center lacks.

Terms of service for members of these groups tend to be open-ended and fluid. (Only seven DHCs have “term limits” – ranging from one to five years - for their committee members.) The norm is for members to serve until they choose to resign.

C. Administration

Unlike governance, administration focuses on the day-to-day operations of an organization. These operations are conducted by a center director and staff rather than overseeing groups. In the case of consortia or membership-based DHCs, members also may assist in these administrative duties.

1. Staffing

Determining DHC staffing levels is an inexact undertaking. While the number of staff at a center may range from two to fifty-one individuals, DHCs count their staff in different ways. Some include undergraduate and graduate students, especially when these individuals are responsible for large portions of a center’s work. Others include only full-time staff, and still others count faculty who are only loosely affiliated with the center. The numbers also fluctuate greatly from year to year because many positions are funded by soft money.

Staff positions are found in the following areas:

Business and Administration

Office managers, administrative assistants
Business managers, accountants, CFOs
Development officer and grant administrators
Communications and publicity staff

Center Management

Directors, co-directors, and associate, assistant and executive directors¹¹
Project managers and coordinators

Content Production

¹¹Associate and assistant directors often have special areas assigned to them which are represented in their titles, for example, “Associate Director for Projects and Research” or “Associate Director (Data Analytics, Pattern Recognition and Machine Learning).”

Producers, production assistants
Content developers, writers
Creative directors, content directors
Film, video and audio managers

Education and Outreach

Coordinators of educational programs and professional development
Directors of educational partnerships and planning
Directors of assessment, outreach, and marketing of educational programs and services
Directors of academic programs
Education technology coordinators (crossover with IT positions)
Education consultants

Facilities Management

Building and operations managers and staff

Information Technology

Coordinators of academic technology, Internet development
Chief technology officers, technology directors
Systems programmers, software engineers, database administrators, information architects
Web site developers, Webmasters, Web application developers
Instructional support, client services, new media lab management, technology evangelists

Library, Archives, and Information Science

Traditional and digital librarians
Metadata specialists and cataloguers
Audio and digital archivists
Digital media producers

Research and Scholarship

Scholars, curators, visiting researchers and professors, research associates
Directors or coordinators of research projects or fellowships programs

Publishing

Editors, managing editors, Web editors, copyeditors, review editors

Miscellaneous

Students assistants assigned to various roles as needed

Staff positions are funded in a variety of ways. Graduate student labor may be supported by an assistantship from the student's academic department, or may be a "joint share" between the center and the department. At state universities, staff often are state employees and are paid through state budget lines. Some center staff are funded entirely by other departments, projects, grants or "special discretionary funds" provided by university administration. For centers located within an academic department, staff may be "shared" by agreement between the department chair and the center director.

A small number of center staff work from remote locations. One DHC's entire programming team is distributed around the U.S. and Eastern Europe. Another center has staff members located in countries where it has its international programs.

2. Reporting Structures

DHCs have two types of reporting structures that are determined largely by the number of staff and the range of programming. Centers with the smallest staffs and a more singular programming focus have a less formal structure, with staff reporting directly to the center director or assistant director.

Centers with mid- to large staffs and diverse programming have a hierarchical reporting structure where lower level staff report to mid- or upper-level staff who, in turn, report to the director. The middle reporting layer may be divided by service area (e.g., network services report to a chief technology officer), by function lines (e.g., programmers report to a head programmer), by project areas (e.g., project staff report to a project manager) or by an incremental series of reporting levels (e.g., teams report to team leaders; team leaders report to an assistant director; the assistant director reports to director.) Some centers have "co-directors" who share management duties and provide coverage for one another during travel periods or sabbaticals. There is also a significant amount of "dotted line" reporting that takes place between directors and the chair or faculty of academic departments participating in DHC projects.

However, even the most rigid reporting structures have some measure of fluidity. For example, staff may sidestep their direct report levels if they have an administrative issue, or they may have opportunities (such as staff meetings) where they report directly to upper management. One DHC characterized its reporting structure as a "soft hierarchy" because the official university reporting lines were not rigidly applied by the center.

3. Shared Appointments

Academic Faculty:

Ninety-two percent of university-based centers have staff with faculty appointments in other academic departments. These appointments may be in traditional humanities departments, the social sciences, engineering departments, and the arts. (For a full list of departments affiliated with centers in this survey, see Appendix D.) Most of these appointments include teaching, research, and administrative responsibilities within the respective department.

Of 47 joint positions identified,¹² 88% are fully funded by the academic department (not the center.)¹³ The academic department usually offers the joint appointees some form of compensation for the extra duties they assume on behalf of the centers. The most frequent form of compensation is release time from teaching. Release time may be apportioned by percentage (i.e., 50% teaching, 50% center work) or by course load reductions that vary from one course

¹²This number is almost certainly an underestimate. The larger DHCs only identified joint positions held by their top management staff.

¹³The remainder are funded by the center, split between the center and an academic department, or funded by discretionary funds provided by an administrative office of the university.

every second year to one course every semester. Other forms of compensation include summer compensation, overload compensation, or stipends. Compensation arrangements are negotiated individually and can vary within departments. Center directors, for example, may receive more release time than other joint appointees at a center.

Presumably those departments who offer some form of compensation to joint appointees do so because they value the appointees' work at the center. However, not all departments are so generous: a few allow teaching release time only if the joint appointee can compensate the department for their unavailability (which they sometimes do using center or grant funds.) One *center* turns the tables even further, by requiring its staff (who are center-funded) to give their teaching monies to the center to offset the loss of their time on center activities.

A small number of joint appointees receive no allowances whatsoever for their dual department/center duties. These individuals agree to the extra workloads because they believe their scholarly interests and the interests of the center are best served by their involvement. Compensation comes in the form of the intangible value they receive for teaching, research, and scholarship.

Joint center/academic department appointments are often specified in contracts that may be reconsidered at various intervals. Tenure-track faculty, for example, may have their contracts reflect more teaching/less center work as they approach their tenure-decision year. Similarly, a center and academic departments may alter their entire compensation formula for faculty as the center's offerings gain more traction and additional faculty time is required by the center.

Administrative Faculty:

Although rarer than academic faculty appointments, shared appointments also occur between the centers and various administrative departments and research centers. Administrative faculty, such as deans or library directors, may have full or provisional affiliations with centers. Senior scholars and research scientists (the latter often from campus computing centers) also may have joint arrangements. Because these individuals usually do not have teaching responsibilities, course release time does not figure into the equation. Instead, these positions are supported by the administrative department or research center, or by a cost share between the center and the department/research center.

D. Operations

A center's operations include the activities it undertakes, the decision-making processes it undergoes, and the measures it uses to assess its work. An understanding of center operations clarifies how the center is run and managed, and the issues it encounters as it strives to implement its agenda.

1. Activities

DHC undertake the following range of activities:

Events

Centers develop and host events such as lectures, conferences, seminars, or performances for the purposes of fostering collegial relationships and promoting discourse. Events may address humanities themes or technological developments. Although some events (such as conferences) are intended for a specific professional community, many are open to entire university communities and often the general public as well.

Product Development

The products developed by DHCs range from traditional materials, such as print publications, to less tangible items, like virtual environments. To gain insight into the wide range of products DHCs offer, it is useful to organize these products by function:

Teaching materials and resources such as online repositories of learning materials; teacher “toolboxes”; online tutorials on various technology topics.

Digital workspaces such as wikis, blogs, and virtual environments used for teaching, creating art, or exploring virtual worlds. These workspaces use Web 2.0 tools that are developed by others, but which are offered by the centers to users for their project needs.

Publications such as online newsletters and e-journals; white papers and articles; textbooks; and guides on topical issues such as scanning, text encoding, best practices for digital projects, etc.

Tools such as plug-ins, conversion tools, authoring and organizations tools, media annotation tools, and desktop versions of digital libraries.

Miscellaneous products such as exhibits (physical and virtual), documentary video, podcasts, and Webcasts.

Programs

Programs are long-term efforts that incorporate many singular activities for the purposes of a larger objective, such as the creation of a digital library, a collaboration, or a professional development curriculum. DHCs programs include:

Development and incentive programs such as workshops/seminars for teachers on how to bring scholarship, technology and learning methods into the classroom; rewards’ programs that acknowledge individuals and groups whose contributions have furthered a disciplinary area or enhanced the work of a center; seed grants to assist in the startup of digital humanities projects

Digital humanities research projects: Projects that use innovative technologies and approaches in humanities research, such as 3-D modeling projects like the Digital Roman Forum¹⁴

¹⁴See <http://dlib.etc.ucla.edu/projects/Forum>.

Compilations for research and teaching such as the Willa Cather Archive¹⁵ and the Walt Whitman Archive¹⁶

Projects that explore technology for humanities teaching and learning such as the Visual Knowledge Project¹⁷ and the Learning Design Studio¹⁸

Academic programs that offer degrees, honors programs, research fellowships and residency programs (See Section IV.D.2.)

Services

Although DHCs do not define themselves as service organizations, a review of their offerings suggests that service plays a large role in their operations. These services include:

Consultation to the academic, cultural, nonprofit, government and corporate communities on issues as diverse as digitization, project management, and learning initiatives

Facilities management for new media and language learning laboratories/classrooms; help desks

Technical infrastructure support for digitization in the field; building and maintaining hardware/software infrastructure for online communities; designing and implementing digital laboratory environments

Web and Internet support such as hosting, storage space, site mirroring, Web site development

Preservation assistance such as archiving inactive projects, workspaces, or images; developing migration plans

Management and administration services such as project planning; brokering services; administrative support (office assistance and grant administration) and providing administrative “homes” to related groups

Educational and pedagogical services such as assessments of curricula, teaching, and educational programming; staff development in humanities instructional methods; course and curriculum design

Technical assistance such as metadata encoding; digital resource design; statistical analysis; hardware/software support; media digitization; prototyping new technologies

¹⁵See <http://cather.unl.edu/>.

¹⁶See <http://www.whitmanarchive.org/>

¹⁷See <http://crossroads.georgetown.edu/vkp/>.

¹⁸See <http://cndls.georgetown.edu/view/support/programs/learningDesignStudio.html>.

Training on the use of various multimedia, center-developed resources and materials, and instructional technologies

Digital humanities expertise and advice on national trends, current best practices, academic and peer review for digital humanities projects

2. Teaching and Other Pedagogical Activities

DHCs strongly believe they have an obligation to nurture and train the next generation of digital humanities researchers, scholars, and professionals. Since the primary route for such training occurs at the college and university level, pedagogical activities at this level are critical. Courses, degree programs, internships, graduate assistantships, and fellowships constitute the building blocks of a larger effort to train individuals in digital humanities scholarship.

Academic Programs

Four of the DHCs surveyed offer degrees in some aspect of digital humanities, but only one is a full degree granting program (a BFA and Ph.D. in digital arts and experimental media.) Two other centers offer certificate or equivalent programs (in humanities computing) that must be taken in conjunction with a regular graduate program, and one center offers an undergraduate cross-campus honors program (in multimedia scholarship) taken in conjunction with a regular undergraduate disciplinary major.

The apparent paucity of degree-granting programs among DHCs is largely a function of sampling bias: degree-granting programs that did not conduct any of the other activities outlined in this study's definition of a digital humanities center (see Section II.A) were *excluded* from the survey. In addition, universities traditionally allow academic departments (not research centers) to grant degrees. A few centers are working around this limitation by assisting academic departments with interdepartmental degree programs, or are developing a certificate program in conjunction with an academic department.

Courses

In contrast to degree-granting programs, center faculty and staff develop and teach a prodigious number of courses in digital humanities topics. Some are involved in developing courses for their university's new digital humanities degree programs (since they cannot offer such programs themselves). Others develop and teach courses on humanities computing in a specific discipline, such as multimedia writing in an English Department, or archaeological geometrics in a Classics Department. Still others are working to incorporate informatics training into the general undergraduate curriculum by integrating multimedia authoring skills into required undergraduate courses.

Academic departments increasingly realize the importance of digital humanities to the skill set of their graduate students, and are now requiring one or more courses on humanities computing in their graduate degree requirements. Courses on "digital history theory and practice," "digital scholarship," and "digital technology for humanities research" were some of the courses specifically cited as required for graduate student training in various humanities discipline ranging from history to American studies, to archeology and architecture.

Centers also are developing faculty training programs on integrating digital resources and technology into teaching and learning. These programs tend to be informal workshops or one-on-one training for individuals.

Internships

Forty-one percent of DHCs offer internships to undergraduate and/or graduate students. Most are formal opportunities that include academic credit and/or pay, require a certain number of work hours, and assign the intern to a particular project or researcher (the latter in a mentor relationship). Informal internships are those in which the DHC hires a student in a role that they define as “intern-like” (i.e., the student is learning about digital humanities on the job), but which has no formal internship program guidelines or selection process.

Graduate Assistantships

Although fewer DHCs (19%) offer graduate assistantships than internships, this probably reflects the tradition of assistantships being awarded through academic departments and not research centers. (The centers that *do* offer assistantships are usually based in an academic department.) However, even when a center does not offer its own graduate assistantships, it often is populated with graduate students who are supported by assistantships from other academic departments. These departments agree to such an arrangement because it gives their students an opportunity to receive digital humanities training that the department cannot provide.

Fellowships

Fifty-six percent of DHCs offer fellowship opportunities at the graduate, postdoctoral, or mid- to senior-faculty level, or to those in other professions conducting work in the digital humanities. Fellowship periods may range from a few days to three years, and can be used to support dissertation research, project development, teaching, and participation in collaborative projects. Compensation varies widely, and may include monetary support, access to technology and technical support, travel monies, teaching release time, research assistants, housing offsets, and administrative and grant writing support. While most fellowships are restricted to graduate students, postdocs or other academics, a small but growing number are being made available to nonacademic professionals, such as librarians or artists, who collaborate with digital humanities scholars.

Some DHCs do not offer fellowships but instead host “Fellows” funded by other departments or institutions. These individuals choose to use their fellowship monies at the center because it offers them resources relevant to their particular fellowship projects.

Other Learning/Training Opportunities

Learning opportunities distinct from the traditional offerings of internships, assistantships, and fellowships are also offered by centers. Most of these opportunities are in the form of workshops and training programs held within a university community or taken “on-the road” for K-12 educational communities. One nationwide, competitive workshop offers early career (pre-tenure) scholars an opportunity to present their work for critical evaluation by senior scholars in the field of digital humanities.¹⁹

¹⁹ See “Center for Digital Research in the Humanities Nebraska Digital Workshop” at http://cdrh.unl.edu/opportunities/neb_digital_workshop/index.php.

Other opportunities include independent study courses for graduate and undergraduate students, residencies for artists and writers, and one-on-one tutoring and consultation with faculty and researchers. Some DHCs are creating learning opportunities outside of academia that may be nurturing the next generation of digital humanities scholars much earlier than ever before: in one instance, by offering internships to students at a local science and technology high school; in another, by bringing inner city students to the center to learn about innovative uses of technology.

3. Decision-making

Deciding what projects and programs to develop is a key function of DHC management. Some centers make these decisions through a formal process which has a competitive selection and evaluation component. However, most decision-making is informal, based on perceived needs, qualitative criteria, and local circumstances.

Informal decision-making

Project and program ideas come to the attention of centers in ways that reflect a mix of opportunism, interest, and serendipity. A center may be approached by a faculty or researcher, or the project may arise from within the center itself as a natural outgrowth of an existing project or a staff member's interests. Centers also actively solicit projects that come to their attention, or make "strategic solicitations" in which they identify grant opportunities, faculty who could benefit from their services, or courses that are ripe for a center's offerings. Politics may also enter the picture when a center is "urged to consider" a project by its university administration or a foundation.

The "review" process for informally assessed projects includes considerations of mission, staffing, budget and potential. Some of the specific criteria cited were:

- Project "fit": Does the project mesh with the center's mission? Does it further the center's research agenda? Does it offer synergies with other center projects? Do the project's needs (e.g., technology, expertise) meet the center's offerings?
- Center resources: Does the center have the necessary resources, such as funding, space, and technologies, to undertake the project?
- Project potential: Does the project enable digital scholarship? How does it do so? (E.g., through the creation of a tool, an archive, etc.) Does it have the potential to build connections to other projects and researchers?
- *Bona fides* of the principal investigator (PI): Does the PI bring the necessary knowledge and skills to the table? Does he have a record of success and a good reputation?
- Funding potential: Does the project have funding? If not, does it have funding potential?

DHCs get answers to these and other questions through extensive discussions with the project's principal investigator. Final decisions are usually made by the DHC director or by consensus of core center staff. When a decision is made to proceed and funding is not available, initial efforts

are spent procuring funding from diverse sources including private donors, university discretionary funds, center funds, grants, and foundations. Most centers offer grant writing support and some even create prototypes to demonstrate the project's potential to funders. While centers rarely provide full funding from their own coffers, one DHC undertakes what it termed "speculative investing," agreeing to spend money upfront to develop a pilot project with the assumption that doing so will help deliver larger sums of money to sustain the project further.

Like funding, staffing for new projects comes from mixed sources. A center may assign its own staff to the project, or use its connections to pool the services of others, such as students, faculty, computing center staff, etc. Projects may also come with existing staff. In the end, staffing levels depend on available resources at hand -- both human and financial.

Formal decision-making

Formal decision-making is conducted on two types of programs: grants and fellowships. DHC grant programs are funded by a center's parent university or by foundations who give the center funds to offer "regrants" for special projects (such as "seed" grants to help projects get started, or grants to develop conferences or seminars.) Fellowships are usually foundation-funded, although some centers report funding contributions from alumni or endowment funds.

Applying for either program is a competitive process, with centers issuing official announcements "calling" for applications. Selection committees then review the applications, applying certain criteria to their selection process. For grants and digital humanities fellowships, these criteria include assessments of the following:

- Quality of proposal (in definition, organization, clarity, scope)
- Quality of candidate
- Likelihood of success
- Technology needs
- Research merit
- Innovativeness

Less "official," but no less important considerations are:

- Does the applicant have agency in the project? Will he be an active participant and not expect the center to do the work?
- Why does the project need the center?
- Does the project fill a gap in the center's own research agenda?

4. Measuring Success

DHCs use qualitative and quantitative criteria to measure the success of their programs. The information they compile is used to gauge how well the center is addressing its mission and mandate; to produce evidence of a successful track record for grant agencies and fundraising; to justify student technology fees; and to raise a center's social capital within its parent institution.

Success is measured at both the project level and for the overall offerings of the center. Grant-funded projects receive more stringent assessments because funding agencies require project

evaluations at various points in a project's lifecycle. Projects that are not funded by grants generally are assessed less frequently and less formally.

The following criteria are used to evaluate *individual projects*:

Qualitative criteria:

- Did the project achieve its goals as specified in proposals and work plans? I.e., Is it on time, within budget, and doing what it set out to do?
- Was the project able to get external funding after the initial development period?
- Is the project being cited? Is the project perceived by others in a positive light?
- Is education being enhanced? Are the outputs being used to teach others?
- Is the project moving the broader digital humanities agenda forward? I.e., Is the project becoming a model for future work?
- Are partners pleased with the outcome?
- Can the project be leveraged into another project?
- Is the project or its resources being used in institutional initiatives?
- What are the project's spin-offs? (i.e., tools, collaborations, contracts, etc.)

Quantitative criteria:

- Results of surveys, user feedback, focus groups (especially for K-12 projects or products), entry/exit interviews
- Event attendance figures
- Number of applications or proposals received
- Number of publications arising from a project
- Amount of data captured or markup undertaken
- Number of program participants
- For online projects:
 - Number of site visits and unique visits
 - Geographic distribution of users
 - Number and length of page views
 - Number of downloads (for tools, products, etc.)
 - Number of daily users

The following criteria are used to assess *the overall success of the center*:

Qualitative criteria:

- The caliber of students, researchers, and faculty applying to the center
- The success of students who work at the center, i.e., their job offerings, success at tenure
- Are people actively seeking out the center for its offerings?

Quantitative criteria:

- The number of rewards received by the center's faculty, researchers, staff and students

- Time to degree (for centers who offer academic programs)
- Course enrollment for center-developed classes
- Lab usage statistics
- Member participation (for membership/consortia)

Centers generally evaluate themselves, although a few are evaluated by independent review committees at their universities. Centers also conduct evaluations for grant-funded projects according to criteria required by each grant agency, and feel these required evaluations are very useful for measuring the success of individual programs. They cannot, however, use these evaluations to measure success across *all* their programs because each funding agency has its own evaluative criteria.

5. How DHC Resources Are Used

DHCs often do not know the full extent of how their resources are used because they do not, or cannot, track this information in a consistent manner. Instead, they characterize use of their resources by communities. Scholars and researchers, for example, use the resources for research, publication, and scholarly engagement. Undergraduate/graduate students and postdoctoral fellows rely on them for research and training in areas not normally offered by their own academic programs. The university community takes advantage of DHC resources for courses, training, technology-enabled teaching facilities, and expertise in humanities computing, and often embeds DHC resources or services into broader university programs.

Teachers use the resources for developing their K-12 course curricula, but also rely on them for professional development opportunities. College and university-level instructors value DHC resources for teaching undergraduates about the use of technology in the humanities, and are using technology-based approaches to teach writing, fine arts, and history.

The artistic community (particularly visual and performing artists and writers) incorporate DHC resources into their work, or use centers as places to develop and demonstrate their creative output. Professional communities of librarians, architects, urban planners and software developers also participate in DHC programs for research. Cultural heritage organizations increasingly partner with centers on projects that require the use of their object collections.

While the groups cited above constitute the majority of DHC users, a significant number of centers consider the general public and local, regional, and state-wide citizenry among their user base. As centers develop more community resources and actively engage interested members of the public in their research collection and community history projects, this user base continues to grow. But *how* the general public is using their Web-based projects is difficult to know.

6. Monitoring Usage

Usage is a key measure of success, but is extremely difficult to gauge for most DHCs products and projects. Although some centers are vigilant about collecting usage information for each of their projects and projects, such vigilance is not the norm. Centers often cite time or resource constraints as limiting their ability to monitor usage.

When usage *is* monitored, it is done most frequently on Web projects or events because usage statistics can be easily collected on these activities. Centers who develop community-based digital resources often monitor the amount of new material added to the resource by users, and use this as a measure of growth and community engagement. DHCs that teach courses or monitor lab facilities may also monitor enrollment or facilities usage.

Usage figures made available during DHC interviews were impressive: for some Web resources, millions of visits/year; for registered resources, tens of thousands of registered users; and for courses and facilities usage, dozens of classes, with some centers reporting total yearly enrollment figures in the thousands. It is futile to compare usage statistics across centers because monitoring mechanisms are so variable. However, these numbers are useful for internal center assessments because they provide evidence of activity and help centers in their decision-making.

7. Preservation Plans

As DHCs develop and accumulate digital content, the issue of preservation is receiving greater attention. While a few centers report that they have no preservation plan (or shift the responsibility for preservation to content owners or principal investigators), the majority do acknowledge their obligation to preserve the process and results of their digital scholarship, and are addressing the issue in various ways. The centers most concerned about the issue are entering into agreements with preservation partners – institutions with expertise and experience in digital preservation issues. Libraries and state-wide digital library initiatives (such as the California Digital Library) currently are the partner of choice. Some DHCs are investigating open source repository solutions such as DSpace,²⁰ while others are considering commercial vendors to outsource their hosting and archiving responsibilities. One DHC is working with several preservation partners, each of whom was chosen for its interest in a particular digital resource of the center.

DHCs also are implementing a number of strategies to preserve their digital resources locally until they can identify a preservation partner or develop a more robust internal preservation plan. Some of these strategies include:

- Educating partners, students, faculty, and researchers that preservation must be considered in project design and development
- Running “live” applications as long as possible
- Implementing a LOCKSS²¹ approach of distributing static copies of digital resources as widely as possible
- Establishing mirror sites
- Keeping archival versions on the center’s intranet

²⁰See <http://www.dspace.org/>.

²¹A preservation strategy based on the assumption that a resource is more likely to remain viable if many static copies are broadly distributed. LOCKSS is an acronym for “lots of copies keeps stuff safe.” See <http://www.lockss.org/lockss/Home>.

- Making model outputs of the resource available in multiple, ubiquitous forms
- Migrating the resource to new hardware and software as older platforms become obsolete
- Offering licensed users a full copy of the resource in the event that the center becomes defunct or is unable to maintain the resource²²
- Separating production versions of resources from research versions, and placing production versions and services into a digital repository
- Bundling past projects and data into current projects.

A few centers are incorporating digital preservation into their research agendas. Two centers who participated in this survey are working with other partners to develop tools and technologies for archiving virtual worlds.²³ Another center is using its students' digital projects as a test bed in a collaborative project to develop archival methods for digital and experimental art. And one center is creating a digital repository for one of its oldest and most successful resources, and is hiring a digital archivist to extend this effort and make it scalable for the center's other resources.

8. Intellectual Property (IP)

DHCs are unanimous in their efforts to make their work transparent and open²⁴ while respecting the IP rights of others, a perspective borne out of their research and teaching mission. Most have some semblance of IP policy embedded within Web site usage statements or in their licenses or user agreements. A few are working to formalize these policies and raise their profile among center staff and users.

Nearly all DHCs allow the researchers and scholars who contribute to the center's activities, or who develop digital products while working at the center, to retain the IP rights in their work. However, these individuals and center staff are responsible for procuring rights to content created by others (referred to as third party IP) which they use in their research. The centers themselves require all those who create content under their auspices to grant them a royalty-free, nonexclusive, perpetual license to use the content for non-commercial purposes.

Beyond these efforts, the methods used to address IP scenarios range from none ("it has not been a problem") to a "case-by-case" handling of issues as they arise, to a pre-emptive approach that uses legal instruments (such as release forms, partner agreements and product licenses) to clarify IP issues in various contexts. One DHC with an active publication program has created a

²²This offer is premised on the hope that one or more of the users will retain the resource and keep it functioning (at some level) into the future.

²³See "Digital Preservation Program Makes Awards to Preserve American Creative Works, *News from the Library of Congress*. August 3, 2007 at <http://www.loc.gov/today/pr/2007/07-156.html>.

²⁴"Open" is used in the broad sense of "for the community good" rather than other definitions commonly used in the IP arena that imply "free" or "without usage restrictions." See Erway, Ricky. Weblog: "No Such Thing as an Open Lunch, *Hanging Together*. RLG Programs/OCLC. February 6, 2008 (<http://hangingtogether.org/?p=354>)

separate nonprofit arm to keep the ownership of copyrights clear and to maintain control over products (textbooks, documentaries, and Web resources) that generate sales and royalties. A few other DHCs are considering a similar model as rights issues become more difficult to handle internally.

As they strive to make their work more accessible, centers are incorporating open source or partial rights schemes for their products (e.g., Creative Commons license²⁵). Some are moving away from (or totally avoiding) the commercial applications and partnerships they had pursued earlier because they found them to be too limiting and restrictive for research, teaching and public use.

Paradoxically, DHCs are turning *towards* commercial applications to protect the IP rights of the third party content used in so many of their programs and projects. Digital right management (DRM) technologies such as watermarking, restrictions on full text downloading of copyrighted works, and complex password protection schemes, are all being used to safeguard against potential infringements. DHCs using DRM mechanisms feel they are important to their content-contributing partners, who can enter into agreements with some level of assurance that the centers are behaving responsibly.

DHCs are also implementing IP education programs for faculty, researchers, staff, and other users of their materials. One center outlines IP issues and policies in its fellowship guidelines; another is incorporating copyright law, fair use discussions, and academic standards policies in the courses it offers. A few university-based centers are working with their law schools to teach students about the IP issues they need to consider as they create and develop their work at the centers.

E. Sustainability

Discussions of sustainability were far-reaching, and included questions about planning strategies, current and past business models, funding sources, and challenges that threaten sustainability. The purpose of this line of inquiry was to identify resources available, efforts undertaken, and plans in place that allow DHCs to operate for the long-term.

1. Planning Efforts

For centers that did *not* arise from an administrative mandate, the biggest hurdle in early formation was outlining a “proof of concept” about why they were needed. Written proposals, official meetings, and applications for in-house startup funds or challenge grants provided opportunities for explaining the rationales, but very few centers underwent needs assessments or feasibility studies that are standard planning tools used for start-up organizations. Rather, the demonstration of need was articulated by identifying a confluence of circumstances that argued for centralization of activities in a “center.”

Planning efforts turned more formal once the centers were established. Twelve centers have a long-range planning document, such as a strategic plan or business plan, that they use for

²⁵ See “About Creative Commons” at <http://creativecommons.org/about/>.

managing center growth and sustainability. Others hold yearly retreats, self-study assessments, or university-mandated assessments, and report that they use the information from these activities for long-term planning. The centers who reported no formal long-range planning documents or activities are acutely aware that they need to turn their attention to these activities, and cite time constraints as the primary reason why they have not yet done so.

2. Funding Sources

Centers receive funding and support from myriad sources: corporations, foundations, federal endowments, government and state agencies, universities, private donations and gifts, monies from consulting, licensing, sales and royalties, and income from their own endowments.

Business and industry provide startup funds, hardware donations, and conference sponsorship as well as valuable in-kind assistance such as the use of broadband technology or nodes on corporate mainframes. Supporters in this category include well-known vendors from the software and hardware industry (e.g., Apple, SUN, IBM) and less obvious sponsors from the automobile, pharmaceutical and publishing industries.

Foundation support usually takes the form of grants for specific center projects, although startup, maintenance, and bridging funds are not uncommon. Foundations also support fellowships, training programs, seminars, matching gifts, and publications. Foundation support comes from philanthropies with large endowments as well as small, family-run trusts targeted to local community activities.

Funds from the U.S. federal endowments and funding agencies have helped many centers get their initial start through challenge grant programs. These agencies also are crucial supporters of meetings and conferences, residency programs, new media facilities development, tool creation, and individual digital projects. At the time this survey was conducted, NEH's Digital Humanities Initiative²⁶ was getting underway, and many centers mentioned their intent to apply to this program for digital humanities startup funds, challenge grants, workshops, and collaboration grants.²⁷

Other federal and state agencies are also important funding sources for DHCs. The various programs in the U.S. Department of Education have supported centers with pedagogical interests, and other, less obvious federal agencies (e.g., the Air Force Office of Scientific Research, USAID, the State Department, and the Small Business Administration) have funded various center projects. Among state agencies, the major funding sources are arts and humanities councils who fund center projects associated with state communities. There are also larger state programs (such as the California Lottery Fund) which contribute general funds for higher education that get funneled down to centers in state university systems.

²⁶See NEH Digital Humanities Initiative at <http://www.neh.gov/grants/digitalhumanities.html>.

²⁷As of this writing, many of the centers participating in this survey have been successful recipients of these grants. See the National Endowment for the Humanities Digital Humanities Startup Grants List of Awardees at: <http://www.neh.gov/howeare/cio/awards/sug.award.list.april.2007.pdf>.

Because the majority of DHCs are located within universities, it is not surprising that universities are a key source of funding. Support comes directly in the form of annual budget lines, or less directly in the form of funding provided by individual schools or departments working with the centers (e.g., the School of Engineering, the Department of English.) In addition to base line operating funds or startup funds, universities frequently subsidize staff salaries, student support, and infrastructure (such as office space or technology.) They also may provide centers with funds generated from the university's student technology fees.

An assortment of special interest groups and other revenue sources also contribute to center funding. Specialty groups (e.g., the American Quilt Alliance), professional associations (e.g., Modern Languages Association), private donations and gifts, conference and event fees, consulting income, and royalties from sales and subscriptions all play a role in DHC budgets. Although these sources contribute relatively small percentages to a center's annual income, in lean years (between grants or during budget cuts), they are often critical in easing cash flow problems.

Centers could only guess as to what percentage of their funding was received from various sources. Because their guesses were ballpark estimates and used different baseline parameters²⁸ they could not be compared in any meaningful fashion. The only statement that can be made with certainty is that universities are the most frequently cited funding source for centers, followed by grant and foundations.

3. Business Models

Business models were discussed in the very narrow sense of finances, resources, and programs used by a center to maintain its operations. The models for university-based DHCs tend to be complex, revealing a mixed calculus of support involving university budget lines and/or in-kind services and infrastructure, combined with some or all of the following: grants, consulting or licensing income, royalties, endowment income, faculty support, corporate support, student labor, and donations. The few centers that depart from this model include a membership-based DHC that relies on academic partners' fees and huge investments of volunteer labor from partner-members in addition to its "home" university's staff and infrastructure support; a membership DHC funded in its entirety by a philanthropy; and an independent center funded by grants and foundation support, endowment income, capital campaigns, and a formal gift program.

These business models are not unusual for what are essentially nonprofit research organizations. Perhaps more interesting than the models themselves are the novel efforts underway by centers to secure resources and expand the models. Some centers, for example, are negotiating unique arrangements with their parent university that leverage the centers' contributions to university-wide teaching endeavors. In one instance, a DHC was able to secure funds from student tuition fees based on its involvement in creating a undergraduate, cross-campus program. In another, a center negotiated full-time faculty commitment to the center (from an original formula of 50:50 split time) by offering the faculty's academic departments a guaranteed numbers of seats for their students in the center's highly popular courses.

²⁸ Some centers broke out the percentages by every possible source while others aggregated them together in large groupings (e.g., "university funding versus all other sources".)

Other novel efforts to expand existing business models include, for one center, the establishment of a European office to provide a base for expanding and diversifying the funding pool. Another center has embarked on a pilot project with its university's academic technology department to identify ways to coordinate staff, efforts and resources more effectively.

Twenty-one centers (66%) report that their current business models differ from earlier versions. When examined more closely, however, many of these changes are in degree rather than kind: i.e., less grants than in the past, more student labor, more university funding, etc. A truly substantial change in the model often occurs when a center matures, as it moves off its startup funds (which are running out) to the more diversified models that now exist.

Some centers change their operational models because they are not satisfactorily moving the center towards its programmatic goals, and these changes subsequently alter the business model. In one instance, a center operating as a seed grant/incubator program decided to develop (and raise funds for) its own programs after determining that incubated projects would lie fallow once they left the center. Another DHC changed its university status from a research center to a research laboratory, a distinction that results in a more precarious funding model (the center must now raise grants for all programming) but which fits better with the center's mission and intent as a place for collaboration and experimentation.

Other business models change with growth or with downsizing. One membership-based DHC expanded its offerings beyond its original university system to a wider array of academic partners, forcing a reconsideration of both funding and governance. Another center originally served the broad academic community under a cost-center model (i.e., fee for service), but was scaled back by its parent university during a period of fiscal crisis, and now serves only the university and operates within its funding structure.

4. Sustainability Challenges

Unstable funding is the primary issue threatening the sustainability of centers. The entire U.S. funding system was thought to be short-sighted in its emphasis on projects, its influence by trends and interests of the moment, and the drastic funding fluctuations that can occur from one year to the next in state, local, and federal budgets.²⁹ A funding infrastructure that focuses on the short-term makes long-term sustainability difficult to achieve.

Instability of infrastructure was another concern, especially in a university context. University-based centers want a sustained commitment from their parent institutions that does not waver in times of fiscal crises, changes in administration (such as a new dean) or with the retirement or resignation of the center's founders. This support needs to include direct budget lines as well as in-kind assistance.

Many centers are considering endowments as a way to overcome unstable funding and infrastructure. (Currently, only 22% of the centers surveyed have existing (and in most instances,

²⁹ For a different perspective on the U.S. funding environment, see "Beyond the ACLS Report: An Interview with John Unsworth," in *Cyberinfrastructure and the Liberal Arts*, a special issue of *Academic Commons*, December 2007. <http://www.academiccommons.org/commons/interview/acls-report-interview-john-unsworth>.

modest) endowments.) Endowment income could decrease reliance on grants, help to bridge the periods between grants, and protect against the vicissitudes of state and federal funding. Unfortunately, endowments are difficult for centers to develop. Universities often block the effort during their capital campaigns. Challenge grants designed to jumpstart endowment fundraising loose traction as the grant becomes one of many overseen by university development offices. And soliciting private endowment contributions requires concerted fundraising efforts that most centers are unable to sustain.

Staffing presents another concern. Universities pay below-market salaries, making it difficult to recruit and retain technical staff (such as Web developers or programmers) and entry-level administrative staff. There is also a shortage of Ph.D.s with the necessary humanities computing backgrounds to fill senior staff positions. When a center *is* fortunate enough to find appropriately trained Ph.D.s to fill its positions, they are frequently lured away by better offers within a few years time.

As centers grow and mature, the importance of smooth management transitions are becoming apparent. In the absence of a transition plan, the departure of a center's founder or senior staff (through retirement, illness or job offers) can jeopardize a center's position. A few centers who have gone through these scenarios recall them as periods of great stress and uncertainty, with threats of closure, changes in oversight, and a paralysis in activities. Others who are facing retirement scenarios in the next few years express great apprehension about their center's future because they lack a transition plan.

Sustainability issues also surface with daily operations. Overextended work agendas, the never-ending amounts of storage needed to accommodate the growing number and size of digital projects, and concerns about the future of individual projects are some of the specific issues cited.

F. Partnerships

To explore the extent of collaborations, DHCs were asked how their partnerships are structured, who they choose to partner with (and why), failed partnership experiences, and their ideas about the elements of a successful partnership.

1. Types of Partners and Partnerships

DHCs partner with individuals and groups in just about every community imaginable:

- Higher education (University schools, centers, departments, and their faculty and students)
- K-12 teachers and schools
- Funding organizations
- Industry
- Cultural heritage organizations
- Community groups
- Federal, state and local municipalities
- Professional associations
- Nonacademic professionals (e.g., multimedia producers, artists, writers)

- Non-governmental organizations (NGOs)
- Broadcast and print media (television, radio, newspaper)
- Publishers
- General public

Sixty-three percent of the DHCs have international partnerships, and another 16% report having such partnerships “peripherally” through a faculty member or researcher’s project. Eighty-one percent of centers both actively seek out partners *and* are approached by others who wish to partner with them. Centers *seek out* partners whose research interests them, who share a commonality in mission, and who have skills or technologies they need. Centers *are sought out* by others for their programs, expertise, and datasets, or because of a vaguely articulated sense that the center is “the right place to do this.”

The structure of DHC partnerships exist on a spectrum ranging from informal (“handshake agreements”) to highly formal (contracts), with a broad array of practices in between. The most informal partnerships generally emerge from personal and professional relationships between the partner and center staff, and proceed solely on the basis of good faith by all parties. They are developed through conversations and some informal, written communications. Partnerships at this level most often occur between the center and faculty, colleagues, and cultural heritage institutions.

The next level of partnership is more formal in nature and includes some type of written agreement. This agreement is a pre-emptive way to minimize misunderstandings among potential partners, and is not intended as legally binding. Work plans, memoranda of understanding, or requests for proposals are examples of such agreements, and they are used to outline the goals, scope of work, intent, and obligations of the parties. Fellowships also are included here, with the application, guidelines, and fellowship award letters outlining the expectations between the center and the fellowship recipient. An increasing number of centers are using written agreements for all partnerships, regardless of prior knowledge or relationship with the potential partner.

A special type of partnership exists for those who contribute to online resources created or managed by a center. These partnerships involve membership or contributor agreements that outline specific actions required (e.g., crediting contributions, securing permissions for use of third party IP) or prohibited (e.g., libelous, defamatory or obscene behaviors.) The agreements are equal parts “social contract” and “rules of the road,” emphasizing that contributors are working towards a greater good and outlining expected behaviors. Use of the resource implies consent to the agreement terms, and failure to adhere to these terms results in the member/contributor having his access rights revoked and/or content contribution deleted. Partnerships at this level generally include members of the educational and academic communities and related professionals groups, as well as the general public (who is often invited to contribute to community-based, online resources). Although there may be a prior relationship with some of these partners, the numbers are often so large as to preclude such a relationship with them all.

The most formal level of partnership is a legally binding contractual relationship. Frequently undertaken with partners in industry, vendors and subcontractors, academic partners in fee-based

initiatives, or international organizations, these contracts are vetted at the highest levels of the center or its parent organization. They outline the formalities of the project, as well as more legal guarantees such as obligations, fees, warranties, indemnities and forms of redress. Grant partners are included as a formal level of partnership because the grant process and award enforces formality and conformity with federal, state, or local (e.g., university) requirements. Partnerships that require a contractual relationship involve significant financial interests or technologies, or are international projects that have an inherent complexity borne of their international nature.

2. Unsuccessful Partnerships

Seventy-eight percent of centers report partnerships that were, in some measure, unsuccessful. Centers are reluctant to describe any of these partnerships as outright failures, characterizing them instead as “difficult,” or “less involved” than others. However, they identified many circumstances that can or did lead to unsuccessful partnership experiences, ranging from external factors (loss of funding) to complex, multidimensional organizational and social issues (mismatched expectations, lack of institutional support, staff changes, etc.) Some of the key issues cited were:

Staff Issues

- Personality problems, such as an overbearing PI, or clashes among staff members
- Staff departures, particularly the departure of a PI, or a key project “evangelist” whose energy and enthusiasm provided much of the project momentum
- New management that does not have the same vision or motivation as the original management
- A partner liaison who is the “wrong person for the job,” i.e., lacks the collaborative, hands-on skills required for digital humanities projects

Partner Lapses or Flaws

- Failure to meet obligations or pull their own weight
- Insincerity or dishonesty about motives
- An overextended workload, with too many projects on their docket that prevent them from paying adequate attention to the collaboration
- “Hoarding” intellectual capital, giving nothing away without compensation
- Delivering substandard work
- Inflexibility
- Lack of entrepreneurial experience and an inability to think creatively about the project
- Waning interest in the project over time

Communication Issues

- Partner does not communicate about why they are not meeting their obligations
- Not enough face-to-face meetings, resulting in pent-up misunderstandings and mismatched efforts

- Leaders agree to things that their staff cannot deliver

Mismatched Expectations

- Different perceptions about time and pace of work, i.e., how long it takes to get things done, what “ASAP” means to both partners
- Different expectations about workloads
- Disagreements about who is the lead PI and who gets credit for various work
- Misunderstandings about the limits imposed on international partners by their national funding agencies (e.g., an international partner’s funds can only be used for students, but the partnership requires professional staff)
- Trying to do too much with too few resources

External Factors

- A lack of funding options, or loss of funding
- Project needs exceed current technologies
- Project proves uninteresting and not worth pursuing further
- Lack of support by the partner’s parent institution
- The “price of admission” (e.g., overhead, bureaucratic oversight) proves too high
- Lack of time to adequately pursue the project
- Language barriers
- Cultural distinctions (with international partners)

3. The Elements of a Successful Partnership

Having acquired many years of experience with various partners, DHCs have clear opinions about the characteristics needed to ensure a successful partnership.

Trust as a Baseline Assumption

Partners must operate on the assumption of trust. Ideally, that trust will have been earned from a pre-existing relationship between the partners, but even in the absence of such experience, partners must agree to trust one another in order to proceed. The element of trust must permeate the partnership, so that staff can confidently delegate and conduct work with the knowledge that it will be completed to their satisfaction.

Characteristics of a Good Partner

Partners must have personal attributes that foster trust and collaboration. Creativity, enthusiasm, vigilance, collegiality, competence, and responsibility are highly valued. So too is a good reputation, a lack of ego (or the ability to keep it in check), insight into the concerns of others, and transparency in word and deed.

Readiness to Partner

Partners must understand that a DHC partnership is a collaboration. As such, it requires all parties to work on project tasks, to support each other and, at times, to make allowances for one another. If partners are part of a larger organization, they must garner the support and approval

of their parent organization. They also must be capable of working outside their professional boundaries and organizational systems, and have tangible offerings that they “bring to the table.”

Shared Values

Partners must share the same vision and goals for the project. They must hold a common intellectual stake in the project and in its success.

Available Infrastructure

Partners must have access to physical, collaborative space. They need stable staffing, and good faculty, students and researchers. They also need appropriate content and technologies to do the job.

Project Preliminaries

Prior to entering a partnership, the parties should conduct a degree of due diligence by looking at their respective performance records and honestly presenting each other with their strengths and weaknesses. As they move closer to partnering, they must identify focused research questions that resonate with all partners. To address these questions concretely, they need a work plan that identifies timetables and budgets, roles and responsibilities, and realistic expectations. Decision-making processes and communication mechanisms must be outlined in advance. All these activities have to be documented, ideally in a written agreement that is signed by all partners and reviewed at regular intervals.

Caring for the Collaboration

A DHC collaboration is often *not* the central activity of its partners: all parties are involved in other activities, including those that are mission critical to their own organizations. Because of this reality, DHC collaborations must be constantly nurtured and managed. Someone in the partnership must assume the role of a “prodder” – a point person who keeps the project moving forward with his enthusiasm and constant attention to the project’s status and activities. The collaboration’s progress must be reviewed frequently to assure that goals remain aligned and efforts are not “straying” from the original intent and focus. Regularly scheduled face-to-face meetings are essential to strengthen personal relationships, defuse accumulated tensions and prevent misunderstandings.

V. Trends and Issues

A. Moving toward Maturity

Theorists who study organizations describe their development in terms of lifecycle phases such as birth, youth, midlife and maturity.³⁰ As organizations move through this lifecycle, they become larger in size, more formal, and more hierarchical. Digital humanities centers, which have been around for the better part of a decade, are moving from the small, informally run

³⁰McNamara, Carter. 2007. “Basic Overview of Organizational Life Cycles.” http://www.managementhelp.org/org_thry/org_cycl.htm; Daft, Richard *Organizational Theory and Design* (West Publishing, St. Paul, Minnesota, 1992), Robert E. Quinn and Kim Cameron’s *Organizational Life Cycles and Some Shifting Criteria of Effectiveness*, *Management Science*, 29, (1983), pp. 31-51.

centers that characterized their startup to more organized and structured forms as they head into maturity.

Concomitant with this change is a new set of challenges. Concerns about startup funding and staffing have been replaced by sustainable funding and identifying/retaining qualified staff. Initial programs have had time to be tested, and now are being reassessed and reconsidered. Partnerships and collaborations have become the bywords of funding agencies and digital humanities practitioners and centers are responding in kind. They are also embarking on efforts to foster greater communication *among* one another both nationally and internationally, as a way of leveraging their numbers for digital humanities advocacy.³¹

In the midst of these changes, centers are assuming a new role, put upon them by humanities departments and universities, as training grounds for digital humanities theory and practice. Academic departments are coming to rely on DHCs to fill gaps in their programs in the area of humanities computing. DHCs also are being called upon by universities to bring informatics literacy to undergraduate education by incorporating digital humanities into liberal arts curricula. This implicit recognition of the pedagogical value of DHCs in furthering undergraduate and graduate education is helping them leverage their position and status in the university environment.

B. Sustainability

Centers continue to struggle over how to sustain their operations in the long-term. The classic center business model starts with a relatively simple portfolio of funding contributed by a foundation or university, and migrates over time to a complex mix of monies obtained from myriad sources that change yearly because of the short-term nature of grants, state and university budget fluctuations, and an absence of any (or any significant) revenue-generating resources by the center. Increasingly, centers are considering endowments as a way to help bring a greater measure of stability to their yearly fiscal uncertainties.

Sustainability issues also arise apart from the financial sphere. As the centers continue to mature, many are experiencing the “first generation” transfer of leadership from the centers’ original founders. Smooth leadership transitions are directly related to how well the center is positioned financially *and* politically within its larger infrastructure. Centers that receive little consideration from their parent institution, who have not proven their value to their parent in tangible ways, and who have no governance plan in place that covers transitions, are at great risk of dissolution when current leadership moves on.

Sustainability also must be addressed at the level of DHC projects and products. How can centers sustain projects that have moved from development to implementation and are now in a “steady state” of production? While some projects (such as pilot projects) do have a finite life, centers increasingly develop resources that are expected by their users to be “live” and accessible for the long-term. The growing numbers of these types of resources argues for sustainability plans at the project, as well as the center, level.

³¹As evidenced by efforts such as centerNet, an online, international network of digital humanities centers. See <http://www.digitalhumanities.org/centernet/>.

C. Tools

Of all the products DHCs offer, tools have received considerable interest of late among the digital humanities research community.³² As digital scholarship grows, centers are increasingly taking on a developer's role, creating new tools (or expand existing ones) to meet their research requirements.

In the interests of furthering research and scholarship, DHC-developed tools are made freely available via various open source agreements. However, there is some concern that the efforts expended in DHC tool development are not being adequately leveraged across the humanities. A recent study commissioned by CLIR³³ (and included in its entirety as Appendix F to this document) found that many of these tools are not easily accessible. They are "buried" deep within a DHC's Web site, are not highlighted nor promoted among the center's products, and lack the most basic descriptions such as function, intended users, and downloading instructions.

The reason for this state of affairs may be related to how tool development often takes place in DHCs. Centers frequently develop tools within the context of a larger project. It may be that, once the project has been completed, the center becomes involved in other activities and does not have the resources available to address usability issues that would make the tool more accessible for others. The unfortunate end result is that significant energy is expended developing a tool that may receive little use beyond a particular center. Funding agencies who support tool development among centers, and who make it a requirement of their grants that the tools be open source, may wish to develop guidelines and provide support for mechanisms that will help enhance the usability of existing tools and expose them more prominently to the humanities community. It may be that funding tool development as a piece of a larger center project is not in the best interest of the humanities community, as individual centers seem unable to maintain these tools beyond the life of the project.

D. Preservation

DHCs are acutely aware of the need to preserve the increasing amounts of digital materials they produce, but they differ in their perceptions of how to do so. Few centers ascribe to the cardinal rule of digital preservation that preservation processes must be incorporated into the earliest phases (i.e., the planning) of the creation of a digital resource. In addition, centers often equate archiving with preservation, not realizing that it is only one component of a preservation plan.³⁴

³²See *Using New Technologies to Explore Cultural Heritage*. A conference sponsored jointly by The National Endowment for the Humanities (NEH) and The Consiglio Nazionale delle Ricerche (CNR) of Italy. Friday, October 5, 2007 Washington, D.C. http://www.neh.gov/DigitalHumanities/Conference_07Oct/DH_Conference.html; Toolcenter at http://echo.gmu.edu/toolcenter-wiki/index.php?title=Main_Page; Brett Bobley, personal communication, July 31, 2001.

³³Nguyen, Lilly and Katie Shelton. *Tools for Humanists Project Final Report*. Report submitted to the Council on Library and Information Resources, April 18, 2008.

³⁴See *Preconference Workshop – Preserving Digital Collections* (Priscilla Caplan) in "Stewardship in the Digital Age: Managing Museum and Library Collections for Preservation and Use" by Diane M. Zorich, *WebWise 2007 Proceedings*, February 28 – March 2, 2007, pp. 9ff. Available online at: <http://www.ims.gov/pdf/WebWiseProceedings2007.pdf>.

Some DHCs place the burden of preservation on principal investigators or content providers. This shifting of responsibility is a risky and inadequate solution. Content is only one component that must be preserved in a digital resource. Software functionality, data structures, access guidelines, metadata and other value-added components to the resource (many of which are created by, and reside in, the centers – not with the PI or content provider) also must be preserved. Without this “digital ecosystem,” the content is stripped of its context and rendered incomprehensible over time.

Preservation is perhaps one of the most urgent problems facing DHCs, as technology changes occur at a breakneck pace and render resources obsolete in only a few years time. It is likely that older centers already have experienced some loss of resources, and scholars in the very near future will be frustrated in their efforts to locate some of the earliest forms of digital scholarship.

E. Intellectual Property

The swirl of IP activity underway among DHCs is a response to the growing importance and complexity of the IP arena and the interplay of these issues with the products, services and activities of the centers. Centers are searching for models that balance their need and desire for openness with a respect for the IP rights of others. Most complain about the “headache” of procuring and managing rights on an individual basis, a time-consuming process that detracts from their research agendas.

Centers also identified new challenges confronting them in the IP arena. A major concern is the IP issues involved in community-built resources. These resources have contributions by potentially thousands of people: traditional rights management does not scale up at this level. Another issue arises with digital art and performance, where the scoring, notating and rendering needed to display a work creates rights issues at the interface of both copyright and trademark arenas. A third concern pits a user’s IP rights against scholarly responsibility for the historical record: how does a center that offers archival or repository services respond to a user’s request to remove his contribution from the digital resource in the archive? These issues encroach on new terrain that the DHCs feel unprepared to address.

VI. DHCs in a Broader Context

A. Current Models

An underlying assumption of this study was that centers could be categorized by models of governance, i.e., membership, consortia, independents, university, etc. However, upon closer analysis, this assumption proves difficult to substantiate because of all the exceptions. Two membership-based centers, for example, are governed in whole or part by a parent university. Some centers still managed by their founders reside in university environments and rely on university resources but apparently operate independently of any overt university governance (oversight is vested in the founders.). Another center has strong programmatic and in-kind support from a university, but declares itself “independent” of its governance and oversight.

In sum, governance as a model is too fluid for reliably characterizing the centers in this survey. Funding models also fall short. With one exception (a center funded in its entirety by a single philanthropy), all the centers are funded by a diverse and changing mix of support that relies greatly on universities and funding agencies/foundations (see Section IV.E.3.)

How then, can DHCs be categorized? When all the considerations of governance, administration and operation are considered, the real distinction lies in the focus of the center. The two clear divisions are:

1. Resource-focused: Centers organized around a primary resource, located in a virtual space, that serves a specific group of members. All programs and products flow from the resource, and individual and organizational members help sustain the resource (by providing content, and in some instances, volunteer labor).
2. Center-focused: Centers organized around a physical location, with *many* diverse projects, programs and activities that are undertaken by faculty, researchers, and students, and offer many different resources to diverse audiences. The majority of centers surveyed operate under this model.

One center (HASTAC) is an outlier in this discussion. It may be an emerging hybrid between the two models outlined above, in that it pursues diverse projects and programs but is membership-based and operates largely in a virtual space.

B. Benefits and Limitations of Center- and Resource-Focused Models

The two models that emerge from this analysis have strengths and weaknesses in their particular approach. Those DHCs with a center-based focus can respond quickly and independently to changes in operations and programs because decision-making is centralized under “one roof.” As a result, these centers are more agile and can experiment and take risks. Their diversified programming base means that an unpromising program can be dropped without compromising the center or its other activities. Their physical presence also allows these centers to interact and develop resources with their local communities.

However, the number of activities undertaken by these centers results in a plethora of resources that must be independently maintained and managed. Expertise is dispersed among many projects, to the possible detriment of individual projects. Should the center be disbanded, projects without external PI support, or a user base willing to sustain the resource, risk being orphaned.

Resource-based centers leverage the knowledge, efforts and shared interests of their members to create a resource that is beneficial to the entire member community. The resource is built by members who provide content, and in some instances, volunteer services, while the center supports the infrastructure, and coordinates, maintains and makes the resource accessible. Efficiencies exist in areas of content creation and compilation, shared member expertise, and management and sustainability of the resource.

But resource-based centers also come with compromises. They may not be as agile as other centers and may be more risk-averse in their decision-making because any change in the operation of the resource directly affects tens of thousands of members. They also may have a hierarchy of member committees or groups that must be contacted before a decision can be made.

In addition, resource-focused centers vest considerable efforts in their startup phase, as they concentrate on compiling a critical mass of content to make the resource valuable, and on front-end systems to make it accessible. Since the resource is the center's *raison d'être*, any problems in this early phase can be extremely risky for the center: everything depends on the resource gaining traction.

C. Current Models and the Changing Nature of Humanities Scholarship

Both center- and resource-focused models are addressing the changing nature of humanities scholarship by building digital collections and tools to make research more efficient, and by exploring different approaches to humanities research. However, some features of these centers may inadvertently hinder wider research and scholarship.

First, the silo-like operation of current centers favors individual projects which are not linked to larger digital resources that would make them more widely known among the research community. When the projects of the 32 surveyed centers are examined *en masse*, one finds hundreds of projects of potential interest to larger communities that are little known outside the environs of the center and its partners. Moreover, in the absence of preservation plans, many of these projects risk being “orphaned” over time, as staff, funding, and programming priorities change. In the absence of repositories that enable greater exposure and long-term access,³⁵ the current landscape of many silo-like centers results in unfettered and untethered digital production that will be detrimental to humanities scholarship.

The silo-like nature of centers also results in overlapping agendas and activities, particularly in areas of training, digitization of collections, and metadata development. With centers competing for the same limited funding pool, they can ill afford to continue with redundant efforts.

The form of collaboration that takes place in today's centers also is inadequate for future scholarship. The differences between the small-scale, narrowly focused collaborations common among DHCs, and the more coordinated, large-scale organizational collaborations characteristic of regional and national centers, are more than just differences in size and degree. They involve wholly new processes of management, communication, and interaction.

Of late, a handful of centers are embarking on collaborations that address broader, community-wide issues (such as preserving virtual worlds, and strategies for managing born-digital materials.)³⁶ Whether these efforts will move centers toward larger-scale models of

³⁵ Greg Crane, “Open Access and Institutional Repositories: The Future of Scholarly Communications,” *Academic Commons*, special issue on *Cyberinfrastructure and the Liberal Arts*. <http://www.academiccommons.org/commons/review/gregory-crane>

³⁶See Preserving Creative America, Preserving Virtual Worlds at http://www.ndiipp.uiuc.edu/pca/?Home%3A_Preserving_Virtual_Worlds and NEH Digital Humanities Start-Up award, “Approaches to Managing and Collecting Born-Digital Literary Materials for Scholarly Use. Blog posting, Maryland Institute

collaboration, or result in new types of centers, is uncertain. However, it is these larger scale efforts --which effectively leverage resources in the community to address broader issues of cyberinfrastructure -- that have been missing from the digital humanities scene and which will be necessary to support future humanities research.

D. Collaborative Aspects Critical to the Success of Regional or National Centers

As digital humanities computing becomes an integrative, multi-team endeavor, the motivations, support structures, and reward systems that make for successful collaboration become critically important. What aspects of collaboration may be critical to the success of regional or national centers? When the current DHC collaborative landscape is considered in light of successful national collaborations in the scientific community, the following characteristics emerge as particularly important.

Compelling, Community-Wide Research Needs

Digital humanities scholarship thrives on the investigation of research questions both large and small, but it is the former that is the best candidate for regional and national centers. Recent collaborative efforts focusing on digital preservation issues (cited above) offer one example of a “big” problem amenable to a large-scale collaboration. Other compelling research needs might coalesce around cyberinfrastructure that supports digital humanities scholarship, such as sharing advanced computing infrastructure, training in advanced technologies for humanities research, or developing repositories for digital collections.

Larger regional and national efforts may also coalesce around humanities research problems that cross-cut disciplinary communities. The Pleiades Project,³⁷ for example, addresses a long-standing need among classicists, archeologists, historians, literary scholars, and other humanists for a reliable, up-to-date reference for ancient geography. Its large scale, cross-disciplinary effort may well establish it as a de facto “national” center for the study of ancient geography.

No Center Left Behind

The current (and currently proliferating) landscape is one of individual centers pursuing separate research agendas. These centers have significant professional interests vested in them and considerable amounts of human, financial and technical infrastructure that is unlikely to be relinquished in deference to other models. Equally important, the centers believe deeply in the value and success of their efforts. Given these circumstances, some DHCs voiced uncertainty about the need for national and regional models, wondering about their purpose, intent and structure.³⁸

Implicit in their concern is the need for clarification of the role of individual DHCs in the context of regional and national centers. As noted in the findings of this report, DHCs are a loci of

for the Humanities <http://www.mith2.umd.edu/news/maryland-institute-for-technology-in-the-humanities-emorys-manuscript-archives-and-rare-book-library-and-the-harry-ransom-center-partner-on-strategies-for-born-digital-literary-collections>

³⁷ An online “workspace for ancient geography” that lets allow scholars, students and enthusiasts update and expand spatial and historical reference information. See <http://www.unc.edu/awmc/pleiades.html>.

³⁸The survey did not include questions about regional and national centers, but some DHCs commented on the topic in the context of other discussions.

activity that is valued by universities, researchers, faculty and students. If regional and national models are to be viable, they will need to draw on the individuals and expertise resident in current centers. All parties need greater clarity about the roles for different types of centers (local, regional and national), as well as strategies for inclusion and interaction between them.

Trust as the Tie that Binds

Academic tenure and review committees have long been accused of failing to give credence to digital scholarship. Michael Shanks, Co-Director of the Stanford Humanities Lab, believes the reason for their hesitation is rooted in trust. These committees want to know if an individual on a team has done the work, or if he is riding on someone else's coattails.

Shanks suggests that if collaborative work in the digital humanities moves into what he calls established "laboratories," collaboration will become associated with "continuity, community, and reputation."

An established Lab has a history independent of its members. A track record will establish a reputation that facilitates trust in the collaborative success of the lab - that people there genuinely work together. So when a new joint publication is produced, it will be far easier to associate individual effort and talent with that of the group - individual scholarship gaining credit from its location within a discipline that is precisely identified with its peer practitioners and community.³⁹

A shift towards this evaluative framework – one that invests a level of trust in the work of the center and reflects that onto individuals - is needed in the humanities if humanists are to put significant efforts into the collaborative activities of regional and national centers.

Motivations

Acceptance by the academy is important to humanists, but for some collaborations it is not enough to guarantee success. Collaborations involving contributions to a community resource often require other reward systems and incentives to help the resource reach a critical mass and to keep it current and relevant to the community.

The ArchNet⁴⁰ project team, for example, found that participant contributions were less than expected several years into the project. They suspect that feedback with their membership (scholars, architects, students, and urban planners interested in Islamic culture) is more critical to participation than realized, and that reward systems which enhance the personal reputation of contributors are important.⁴¹ MERLOT offers such rewards to its contributors by means of a multi-tiered system that includes recognition for exemplary contributions, various service awards, and a peer review system that rates contributions. Equally important, MERLOT users

³⁹Shanks, Michael. "The idea of a Humanities Lab," *Weblog: Michael Shanks - Archaeologist*, February 6, 2008, <http://documents.stanford.edu/MichaelShanks/218>.

⁴⁰ See "ArchNet" at <http://archnet.org/lobby/>

⁴¹ Anne Beamish, "Building a Culture of Generosity: Activity, Participation, and Sustainability in an International Design Community," Paper presented at a workshop *on Sustaining Community: The Role and Design of Incentive Mechanisms in Online Systems*. November 6, 2005, Sanibel Island, FL. Available at: <http://jellis.org/work/group2005/papers/beamish-group.pdf>.

(higher education faculty and instructors, middle and high school teachers, librarians) offer additional “social rewards”: they comment, rate, and incorporate contributions into their personal teaching collections. These activities indicate peer recognition (through use) that enhances a contributor’s reputation.

In the sciences, motivating forces take a different form. In a study of data contributions to genetics databases, the primary motivation came from two external sources: leading scholarly journals and funding agencies, who require data deposition as a prerequisite to publication (for the former) and as a condition of a grant award (for the latter.) Altruistic reasons, while less common, also were a source of motivation: contributions were often made out of a sense of obligation to the community, or a desire to contribute to a valuable resource.⁴²

For national and regional DHCs that emerge around a data resource, identifying motivations and incentives is critical. Some of the more forceful measures (funder-mandated contributions) may have a role, while others (prerequisite for publication) may not. The spirit of sharing and openness that characterizes humanities research must be realistically balanced with professional incentives and opportunities.

The Nature of the Work

Studies on scientific collaborations are abundant, and much of what has been reported mirrors what the centers themselves describe as important characteristics of partnerships (see IV.F.3.) However, the traits articulated by DHCs focus on the partner and the process, while studies in the literature also consider how the nature of the work may be related to the success of a collaboration.

A recent study of over 200 scientific laboratories⁴³ suggests that successful large-scale collaborations occur most frequently when the work is easily divided into components rather than “tightly coupled.”⁴⁴ Even in an age of instantaneous and ubiquitous communication mechanisms, highly integrated projects apparently require the frequent and often innocuous interactions (such as hallway conversations) that occur when collaborators are co-located rather than geographically dispersed.

Studies also show that collaborations organized around the sharing of data or tools are easier to accomplish than those organized around the sharing of knowledge. Similarly, projects involving aggregation of resources are easier to develop than projects involving co-creation of resources.⁴⁵

⁴² Bos, Nathan, Erik Hofer, Judy Olson. “How are public data contributions rewarded in open genetics databases?” Paper presented at a *Science of Collaboratories Symposium*, New Orleans, August 6-12, 2004. Powerpoint presentation available at: http://www.scienceofcollaboratories.org/NewsEvents/AOM/Bos_PublicData.ppt

⁴³ In the sciences, the term “collaboratory” (a conflation of “collaboration” and “laboratory”) is used more often than “center.” A collaboratory operates largely in a virtual space (which functions as the “center”), is regional, national or international in scope, and brings together researchers around a central need or research question in a scientific community. See “Resources: Collaboratories at a Glance,” <http://www.scienceofcollaboratories.org/Resources/colisting.php>.

⁴⁴ Olson, Judith S., Gary M. Olson, and Erik C. Hofer, “What makes for success in science and engineering laboratories?,” *Proceedings of the Workshop on Advanced Collaborative Environments*, Redmond, Washington. (September 8, 2005): p. 1, <http://www-unix.mcs.anl.gov/fl/flevents/wace/wace2005/papers/olson.pdf>.

⁴⁵ Bos, Nathan, Ann Zimmerman, Judith Olson, Jude Yew, Jason Yerkie, Erik Dahl and Gary Olson, “From Shared Databases to Communities of Practice: A Taxonomy of Collaboratories,” *Journal of Computer-Mediated Communication* 12, no. 2 (2007), <http://jcmc.indiana.edu/vol12/issue2/bos.html>.

These findings may be related to the above notion about loosely coupled versus tightly-coupled projects, but they also likely reflect the belief that it is easier to transmit information than knowledge.

E. Some Science Models for Consideration

As part of a large NSF-funded study of collaboratories, Bos et. al.⁴⁶ created a typology of collaboratories based on organizational patterns found in existing, large-scale scientific collaborations. Because they employed a “bottom-up” methodology designed to help those who are developing new collaborations, their findings are particularly relevant when considering the types of regional and national centers that might be developed in the humanities.

The classification system developed by Bos and his colleagues is based largely on the goals inherent in existing collaborations. Some of these same collaboratory types already exist in the humanities on a smaller scale; others are found in community-based projects of interest to the humanities:

A Shared Instrument Collaboratory provides remote access to large, expensive scientific instruments. These types of collaborations are prevalent among astronomers who need access to large telescopes, and physicists who need access to particle accelerators. It may be a relevant model for humanists who need access to supercomputers for advanced computational work.

A Community Data Systems Collaboratory is a semi-public (i.e., open to the profession) information resource created, maintained or enhanced by a geographically distributed community. Well-known biology databases such as the Protein Databank and GenBank are organized as these types of collaborations. In the humanities, the Pleiades Project may be the closest manifestation of this model, although it shares some aspects of the *Open Community Contribution System* model (below) as well.

An Open Community Contribution System is an open project that aggregates the *efforts* of many geographically dispersed individuals towards a common research problem. A project that parallels this model in broad strokes is the Library of Congress/Flickr Commons collaboration, in which the collective knowledge of the public is used to enhance cataloging and metadata of LC images via social networking mechanisms.⁴⁷

A Virtual Community of Practice is a community of individuals who share a research interest and communicate about it online. The community does not undertake joint projects: rather, it shares professional information, advice, techniques, and contacts. The humanities have many examples of collaborations of this sort, one of the most prominent being H-NET.⁴⁸

A Virtual Learning Community is a community brought together to increase the knowledge of its

⁴⁶ Ibid.

⁴⁷ See “The Commons” at <http://www.flickr.com/commons>; Raymond, Matt. Weblog: “My Friend Flickr: A Match Made in Photo Heaven.” The Library of Congress Blog. January 16, 2008. <http://www.loc.gov/blog/?p=233>

⁴⁸ See “What is H-NET?” at <http://www.h-net.org/about/>

participants through formal learning programs (not through original research). These communities are often affiliated with degree-granting programs, but may also be organized around professional development opportunities. For example, a national or regional training center that focused on digital technologies for humanities research would constitute a virtual learning community collaboratory.

A Distributed Research Center is a virtual version of a university research center. This type of collaboratory joins the expertise, resources and efforts of many individuals interested in a topical area, and conducts joint projects in that area.

A Community Infrastructure Project focuses efforts on developing infrastructure (i.e., tools, protocols, access methods, etc.) to further work in a particular domain. The Internet Archive⁴⁹ models this type of collaboratory by bringing together efforts of individuals, information science professionals, technologists and cultural heritage institutions to create an infrastructure for archiving Web and multimedia resources for research.

In looking for models that can address the changing needs of humanities scholarship, the models employed by the sciences, which Bos summarizes in the above typology, offer a starting point for discussion. Copious research has been done on these collaborations, particularly on the organizational structures and behaviors that affect their success. As the humanities community considers “next steps” for the development of digital humanities centers, it might investigate these organizational and social factors more closely and apply their lessons within the context of the humanities.

⁴⁹ See “About the Internet Archive,” at <http://www.archive.org/about/about.php>.

Appendix A - Sources for Survey Candidates

Organizations identified as digital humanities centers (or humanities computing centers), or whose names⁵⁰ and activities suggest they function as such centers, were gathered from the following resources:

- The National Endowment for the Humanities Summit of Digital Humanities centers (<https://apps.lis.uiuc.edu/wiki/download/attachments/21913/DH.Summit.Attendees.pdf?version=1>)

Lists the names of 18 DHCs who participated in this NEH event. Organizations were selected by the Maryland Institute for Technology in the Humanities (MITH), a Summit organizing partner.

- The Consortium of Humanities Centers and Institute (CHCI) <http://www.fas.harvard.edu/~chci/index.html>

An international membership organization of over 150 humanities centers and institutes.

- Digital Humanities | Center by Type (<http://digitalhumanities.pbwiki.com/centers%20by%20type>.)

This wiki lists hundreds of organizations worldwide that are involved in humanities computing, including digital libraries, digital humanities projects, and professional associations dedicated to humanities computing. Based on an initial list of compiled by Willard McCarty and Matthew Kirschenbaum in 2003,⁵¹ the current wiki is hosted by centerNet, a recently created international network of digital humanities centers.⁵²

- Other sources. A handful of organizations were identified from the following resources:
 - DHC Web sites (DHC sites often cross-link to other DHC sites)
 - The American Council of Learned Societies' publication entitled, *Our Cultural Commonwealth: The Report of the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities and Social Sciences*, 2006 (Washington, DC: ACLS)⁵³
 - The Council on Library and Information Resources
 - Google

⁵⁰The names of DHCs are highly variable and often misleading. An organization whose title suggests large-scale research and development activities (such as the *Center for Advanced Research Technology in the Arts and Humanities* at the University of Washington) may offer, upon closer inspection, nothing more than computer facilities for faculty. At the other end of the spectrum, there are DHCs whose names belie the expansive nature of their work and offerings (for example, the *Women Writers Project* or the *Perseus Digital Library*.)

⁵¹McCarty, Willard and Matthew Kirschenbaum (2003) "Institutional models for humanities computing," *Literary and Linguistic Computing* 18.3: 465-89

⁵²See centerNet at <http://www.digitalhumanities.org/centernet/>.

⁵³Available at <http://www.acls.org/cyberinfrastructure/OurCulturalCommonwealth.pdf>.

- Wikipedia

Appendix B – Surveyed Organizations

American Social History Project - Center for Media and Learning
 Ancient World Mapping Center
 ArchNet
 Center for Digital Humanities, University of California, Los Angeles
 Center for Digital Research in the Humanities, University of Nebraska
 Center for History and New Media, George Mason University
 Center for Literary Computing, West Virginia University
 Center for New Designs in Learning and Scholarship, Georgetown University
 Collaboratory for Research in Computing for Humanities, University of Kentucky
 Computer Writing and Research Lab, University of Texas
 DXARTS (Digital Arts and Experimental Media)/CARTAH (Center for Advanced Technology
 in the Arts and Humanities) University of Washington
 Experiential Technologies Center (formerly Cultural VR Lab)
 Heyman Center for the Humanities, Columbia University
 Humanities, Arts, Science and Technology Advanced Collaboratory (HASTAC)
 Illinois Center for Computing in Humanities, Arts and Social Science (I-CHASS)
 Institute for Advanced Technology in the Humanities, University of Virginia (IATH)
 Institute for the Future of the Book
 Institute for Multimedia Literacy, University of Southern California
 Maryland Institute for Technology in the Humanities (MITH)
 Matrix - The Center for Humane Arts, Letters and Social Sciences Online
 Multimedia Education Resource for Learning and Online Teaching (MERLOT)
 National Humanities center
 Perseus Digital Library
 Scholarly Technology Group, Brown University
 Stanford Humanities Lab
 Townsend Center for the Humanities, University of California, Berkeley
 University of California Humanities Research Institute
 University of Chicago, Division of Humanities, Humanities Computing
 Virginia Center for Digital History
 Visual Media Center, Columbia University
 Women Writers Project
 Writing in Digital Environments, Michigan State University

Appendix C – Survey Instrument

The following template was used to gather information from DHC web sites and to conduct the individual phone interviews.

1. General Background Information

(Purpose: To gather a basic set of background information about each of the DHCs in the survey)

Information to be collected:

- DHC name and acronym
- Physical and virtual locations
- Year of creation
- Founding history
- Domain (the particular humanities discipline(s) that is a focal point for the DHC, e.g., Islamic architecture, history, gender studies, etc.)
- Staffing
- Mission / vision statement; goals and objectives of the DHC
- Brief description of the center
- Constituencies served (i.e., scholars, university community, K-12 teachers, artists, etc.)

2. Governance Structure

(Purpose: To identify the organizational structure and governance of the DHC; and (if relevant) where the DHC exists within a larger parent organization and how that parent organization oversees the DHC.)

Information to be collected:

- Organizational structure (membership, academia, consortium, etc.)
 - Reporting structure (DHC director reports to whom?)
 - Ancillary groups involved in governance and oversight: e.g., Advisory Committees, Steering Committees...); selection criteria for members of these groups, the duties of these groups, and the terms of service for individuals in these groups

(For DHCs operating under academic/university governance)

- DHC's placement on the university's organizational chart
- If that placement has changed since the DHC's inception, explore why (Was it due to changes in the DHC's circumstances, such as growth, staffing, or cross-campus relationships? Was it the result of changes in the university's circumstances, such as institutional restructuring or new management decisions?)

(For DHCs operating under membership governance)

- The DHC's membership base, levels of membership, and benefits associated with each membership level
- Groups that make decisions on behalf of the membership (e.g. Board of Directors or equivalent); this group's members, their affiliation, terms of service, committee appointments and duties

(For DHCs operating under consortial governance)

- Partners involved in the consortium and their roles and responsibilities
- Groups that make decisions on behalf of the consortium (e.g., Board of Directors, Trustees...); this group's members, their affiliation, terms of service, committee appointments and duties
- Formal policies or agreements that govern the consortium
- Distinctions in governance between national/international collaborations

3. Administration

(Purpose: To identify how the DHC is organized and administered internally, i.e., its “top-down” management structure, from director to staff.)

Information to be collected:

- Internal organization (“org” chart) and reporting structures
- Roles of staff
- Shared academic appointments/arrangements; academic departments involved and the logistics of the shared appointment (percentage of time for each program; shared or distinctive responsibilities, etc.)

4. Operations

(Purpose: To identify the programs and activities of each DHC; how the DHC makes decisions about which activities and programs to pursue; to gauge how the DHC allocates time/staffing/funding resources to its activities; and to gauge the extent to which monitors how (and how much) its products/services are used.)

Information to be collected:

- The activities, programs, products, and services offered by the DHC
- How the DHC decides to undertake an activity or program, or offer a product or service (i.e., the decision-making process)
 - Formal or informal processes for decision-making
 - How are programs and activities developed, reviewed, funded, documented and staffed?
 - How does the DHC measure the success its programs, activities, products or services?
- Products and services - usage and long-term planning:
 - The volume of use for digital products/services that the DHC offers
 - Characteristics of the user base for the DHC's products and services – who they are, how they are using the product/service?
 - Plans for preservation / archiving of digital products
 - Intellectual property and ownership concerns involved with products and services
- The teaching and other pedagogical activities conducted at or through the center (courses, academic degree programs, internships, fellowships, or other structured educational opportunities)

5. Sustainability

(Purpose: To identify resources, efforts undertaken, and plans in place that allow the DHC to operate for the long-term (i.e., the funding, staffing, in-kind agreements for goods/services, business models, etc.))

Information to be collected:

- Planning efforts
 - Standard “tools” (i.e., feasibility studies, needs assessments) used to gauge sustainability prior to the establishment of the DHC
 - Standard “tools” or methodologies (e.g., strategic plans, business plans) used to plan for the growth and sustainability of the DHC in the long-term
- Financial/Funding information:
 - Sources of funding (general categories [i.e., grants]; and specific funders [e.g., NEH; IMLS];
 - Percentage of funding received from various sources (e.g., 20% grants; 15% university, etc.)
- Business model(s)
 - Current model; does the DHC believe this model is sustainable
 - Past models: If the DHC has changed its business model over time, identify the reasons behind the change
- The challenges faced by the DHC that threaten sustainability (e.g., funding, staffing, local institutional/political issues, etc.)

6. Partnerships and Collaborations

(Purpose: To identify the extent of internal and external partnerships undertaken by DHCs that are **not** governed under a consortial model and to identify how these partnerships are structured and administered; for all DHCs, to identify why partners are drawn to the center (i.e., reasons for collaborating.))

Information to be collected:

- The DHC’s partners (and associated projects)
 - Formal vs. informal nature of the partnership
 - If formal, investigate the terms of the partnership (e.g., obligations, expectations, decisions about intellectual property and ownership, etc.)
 - National/international nature of partners
 - Methods for selecting partners (e.g. Are they solicited by the DHC? Is the DHC approached by interested parties? Both?)
 - Determine whether partnerships emerge from previous relationships between members of the DHC and the partnering organization
 - Identify incentives that encourage people/organizations to partner with the DHC in its various projects
 - Inquire (generically) about the DHC’s experience with, or ideas about, successful and unsuccessful partnerships to identify factors that may be critical for the success of regional or national DHCs.

It was assumed that some DHCs would be unable to answer certain questions in the survey, perhaps because they don’t track information in certain areas (such as user base information) or

are not privy to various types of information (such as financial data). In the context of this survey, the inability to answer a question was not considered an impediment. In some instances, understanding what an organization didn't know about its operations may be a useful indicator of issues that warrant consideration in future discussions of regional or national centers.

Appendix D: Academic Departments Affiliated with DHCs in this Survey

Architecture and Urban Design
Art History
Cinema Studies
Classics
Comparative Literature
Computer Science and Engineering
Criminology, Law and Society
Critical Theory
Cultural and Social Anthropology
Dance
Design
Education
Electrical and Computer Engineering
English
French and Italian
History
History of Science and Technology
Interactive Technology & Pedagogy
Modern and Classical Languages
Music
Philosophy
Physics
Rhetoric
Rhetoric and Writing
Speech Communication
Sociology
Spanish and Portuguese
Theology
Writing, Rhetoric and American Culture

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Appendix F

Tools for Humanists Project Final Report April 18, 2008

Council on Library and Information Resources
Lilly Nguyen and Katie Shilton

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1. Introduction – Why tools?

Digital tools are an important component of the cyberinfrastructure that supports digital humanities research [1]. Tools for humanities research – software or computing products developed to provide access, interpret, create, or communicate digital resources – are increasingly developed and supported by Digital Humanities Centers (DHCs) and the wider digital humanities community. Such tools represent a significant investment of research and development time, energy, and resources.

Tools are distinct from other assets developed and cultivated by DHCs. These additional assets include *resources* and *collections*. Researchers use tools to access, manipulate or interpret resources or collections while resources are “data, documents, collections, or services that meet some data or information need” [2]. In a recent report on cyberinfrastructure for the humanities and social sciences, ACLS distinguished tools from collections by emphasizing that tool building is dependent on the existence of collections [3]. Resources or collections may be associated with a tool and may serve as an indicator of a tool’s functionality and value, but are not themselves tools. As such, we define tools as software developed for the creation, interpretation, or sharing and communication of digital humanities resource and collections.

Because tools provide the action (rather than the subject) of digital humanities research, digital tools are one of the most extensible assets within the digital humanities community. Researchers can share tools to perform diverse and groundbreaking research, making such tools a critical part of digital humanities cyberinfrastructure. If these are tools are not visible, accessible or understandable to interested researchers, they become less likely to be used broadly, less able to be built upon or extended, and therefore, less able to support and extend the research for which they are intended. CLIR’s interest in supporting the cyberinfrastructure of digital humanities has spurred us to evaluate the landscape of digital tools available for humanities research.

2. Research questions

CLIR’s concern for accessibility and clarity of tools is based on a larger study of the characteristics of digital humanities centers (DHCs), where tool are frequently made available to researchers. This context prompted the two research questions that guide this evaluation project.

RQ1: How easy is it to access DHC tools?

RQ2: How clear are the intentions and functions of DHC tools?

The evaluation research outlined in this report answers these questions by delineating variables that respond to the goals of accessibility and clarity. We use these variables to evaluate a purposive sample of 39 digital humanities tools.

3. Methodology

Following a scope provided by CLIR, this evaluation project focused on defining elements that contribute to findable, useable digital tools and ranking existing DHC tools according to these elements. Our first challenge was to clarify the definition of “digital tool” through a literature review on cyberinfrastructure and digital humanities. This allowed us to refine and define distinct characteristics of digital tools and delineate a sample set of tools hosted by the Digital Humanities Centers listed in Appendix 1. Section 3.a. details this first phase of the evaluation research.

Once we determined our sample, the next step was to create an evaluation framework and instrument. Concentrating on CLIR's evaluation interests of findability and usability, we surveyed our sample of 39 tools and looked for elements which made tools easy to access and easy to understand. We detail the process of creating an evaluation framework in Section 3.b.

Once we drafted our sample set and scales, we submitted an evaluation strategy to CLIR for approval. We then performed several trial evaluations to check for inter-indexer consistency. This is detailed in Section 3.b.iii. After several iterations of this consistency check, we divided the 39 tools in half, and each researcher evaluated her assigned tools. We then combined our data and began the process of data analysis, detailed in Section 4.

3a. Definitions, sample, limitations and assumptions

3.a.i Definitions

We have defined tools for humanists as software intended to provide access, create, interpret, or share and communicate digital humanities resources. Further, the tools evaluated in this project are products of the digital humanities community and are designed to be *extensible*, that is, used with resources beyond those provided by the creating institution. We have grounded this definition within a typology of digital tools drawn from the wider digital humanities literature. Our typology defines tools according to three particular dimensions: *objectives*, *technological origins*, and *associated resources*.

Tools as defined by objectives

Based on digital humanities literature, researchers use digital tools for the following objectives:

- *Access and exploration of resources*: to make specialized content “intellectually as well as physically accessible” [4].
- *Insight and interpretation*: to enable the user to find patterns of significance and to interpret those patterns [3].

In addition, based on our observation of U.S. DHCs, we propose additional tool objectives:

- *Creation*: to make new digital objects or digital publications from humanities resources
- *Community and communication*: to share resources or knowledge

These four objectives guided the selection of our sample tools from the DHC sites identified by Diane Zorich's work. Additionally, these objectives suggest future evaluations of tools that extend beyond accessibility and clarity to evaluate how *well* DHC tools support and facilitate these critical functions. Given CLIR's interest in questions of clarity of and access to tools, we have not yet explored the use, value or effectiveness of tools according to these objectives. That is to say, we did not consider issues of performance, which is a promising area for future consideration.

Tools as defined by site of technological development

Based on our observation of DHC websites, we found variation in communities of tool authorship. Some tools were the product of a single center (e.g. the Berlin Temporal Topographies built by Stanford Humanities Lab). Some tools started outside of the humanities community, but centers or cooperatives adapted the tools heavily for humanities research (e.g. SyllabusFinder adapted from the Google search engine by George Mason University's Center for History & New Media). Some tools were developed outside of the humanities community and appropriated (with little or no modification) by the humanities community (e.g. blogs or wikis). The spectrum of technological origins thus spanned a range from single center authorship to appropriation from an outside community (see Table 1). We have only considered

tools authored by a single institution in the digital humanities community or by a collaboration of institutions in the digital humanities community for our final sample group.

Tools as defined by associated resources

Our observation of DHC websites also illustrated that tools vary along a spectrum according to the resources with which they interact. Some tools work only with resources provided by the center (e.g. the Women’s Studies Database at the Maryland Institute for Technology in the Humanities.) Other tools can interact with resources provided by the center in *addition to* outside resources (e.g. BATS assistive technology created by the Ancient World Mapping Center.) Finally, some tools work exclusively with outside resources, and Centers provide no in-house collections for use with the tool (e.g. the Center for History & New Media’s ‘Omeka’ digital display tool.) For our study, we focused on tools that interact:

- With resources provided by the center *and* outside resources;
- With only outside resources.

We exclude tools that only interact with in-house resources from our sample based on the view that *extensible* tools are most useful for researchers, as they allow individuals to explore or analyze their own data and resources. As previously explained, we judge extensible tools to be of the most interest to the broader infrastructure for the digital humanities, as such tools enable broad community use as well as highly customizable, individualized research.

3.a.ii. Evaluation Sample

Given the limitation to extensible tools, we chose to limit our survey of DHC tools to (1) items created or adapted within the humanities community that were (2) designed for use with outside resources or a mix of outside and indigenous resources. We excluded those tools that had been developed in the outside (non-digital humanities) community or had been developed to function only with a single collection or resource. This allowed us to narrow our sample to 39 tools for evaluation. The table below illustrates how the 39 tools group according to two variables: technological development (developed by a digital humanities center or a humanities community) and associated resources (usable with outside resources or mixed resources).

Table 1: Matrix of Tools for Evaluation (Final sample group)

	Digital Humanities Center	Humanities Community (also if DHCs partner w/ other organizations)
OUTSIDE RESOURCES	Collaborative Geneology - Jenkins Collab.	Video Annotation System (HASTAC and Duke)
	Collaborative Timeline -Jenkins Collab.	HASS Grid Portal (HASTAC and UCHRI)
	Combinformation, Texas A&M	Historinet and ADAA (Advanced Digital Archive Assistance) - HASTAC and Stanford Humanities Lab
	CommentPress-Institute for the Future of the Book	Syllabus Finder, GMU
	CUSEE Me Reflector, WVU	
	Digital Discernment, Georgetown	
	Edition Production Technology (EPT), ARCHway Project	
	English to Greek Word Search-Perseus	
	English to Latin Word Search-Perseus	
Greek Morphological Analysis-Perseus		

	Interactive Archaeological Knowledge System-Matrix	
	Latin Morphological Analysis-Perseus	
	Media Matrix - Matrix	
	Omeka GMU	
	Poll Builder, GMU	
	Project Pad - Matrix	
	Scholar Press, GMU	
	Scribe, GMU	
	SOPHIE-Institute for the Future of the Book	
	Survey Builder, GMU	
	Tech Ticker - Jenkins Collab.	
	The Poster Tool, Georgetown	
	Virtual Lightbox - MITH	
	Web Scrapbook, GMU	
Zotero, GMU		
MIXED RESOURCES	BATS, Ancient World Mapping Center	CITRIS Collaborative Gallery Builder, HASTAC
	DySE Generator, UCLA	
	Grassroots-WIDE MSU	
	History Engine-Virginia Center for Digital History	
	Ink-WIDE MSU	
	Literacy Resource Exchange-WIDE MSU	
	Token X, U of Nebraska	
	Virtual Humanities Lab - STG Brown	
	vrNav, UCLA	

3.a.iii. Research Limits and Assumptions

This evaluation of tools created by DHCs is part of a much larger study of the landscape of DHCs, which has determined certain features of our study. CLIR's larger survey of DHCs (see Appendix 1 for a list of these humanities centers) predetermined the population of centers from which we drew our sample. We have identified tools from each of these centers, further refined by the previously explained criteria based on our understanding of tools and infrastructure. Additionally, we also excluded certain parameters that we might have considered in defining the scope. Specifically, we did not employ user population as means of selecting the sample of tools to study, and we used a limited understanding of the idea of "findability."

Based on the literature, we have assumed that a wide swath of faculty, independent researchers, university staff, and both graduate and undergraduate students utilize humanities cyberinfrastructure [3]. Findability bears heavily on questions of accessibility of digital tools and suggests users' ability to search and find tools without previous knowledge of the tools. As such, a findability would consider a wider breadth of information-seeking technologies, including search engines, and would reflect the highly complicated—and

more realistic—landscape that users encounter when trying to search and find digital humanities tools. In order to limit our evaluation to dimensions of *accessibility* and *clarity of intention/function* within the context of the given DHC settings, we have not evaluated *findability* of digital tools. We have excluded findability in a general sense and focused solely on questions of tool accessibility within these sites. Findability depends upon the metadata associated with tools as well as on the structure of the system supporting the websites that provide the first point of access for users, since web crawlers (and hence indexing) may only go two or three levels into a site. Thus, evaluating the existing search engines, systems, and metadata structures and standards associated with tools would be valuable follow-up research. But given the limits and needs of CLIR’s research directive, findability from outside the website is beyond the scope of this project. Rather, we consider a limited notion of findability from within the website.

Consequently, we have also made some basic assumptions about users. In order to evaluate accessibility that excludes findability, we assume users who already know that tools are available, and who know to explore DHC websites for tools. We have evaluated whether such a user can easily find the tool on a DHC’s website, easily understand the tool’s intention, and easily begin using the tool.

Another assumption made early in our work which has not proved entirely tenable is that tools would be *downloadable*. Downloadable tools are easy to envision. They are discrete pieces of software run on a user’s own computer and resources. However, a focus on software download is increasingly irrelevant in an era when both storage and computing power are moving into “the cloud”: the combined computing power of servers owned by others [2]. We have therefore evaluated both downloadable tools (e.g. UCLA’s Experimental Technologies Center’s vrNav virtual reality software) as well as tools used online and supported by the servers of others (i.e. the University of Nebraska’s Center for Digital Research in the Humanities’s Token X text visualization tool.) We have also considered the clarity of the process of using tools with datasets or resources – either on a user’s computer or in the “cloud” – when evaluating the usability of these tools.

3b. Evaluation framework and instrument

We have designed this evaluation framework to answer our research questions:

- How easy is it to access DHC tools?
- How clear are the intentions and functions of DHC tools?

Based on these questions, we have created two scales:

- Ease of Access: Discovering Tools
- Clarity of Use: Enabling Use of Tools

To address these research questions, we developed scales to measure the strength of each of the 39 tools with regard to four variables: (1) identification of tool, (2) feature, display, and access, (3) clarity of description; and (4) clarity of operation. To construct measurable scales, we divided the variables into distinct indicators that we could rank as poor, moderate, or excellent. The next sections describe the indicators and variables. We conclude the evaluation framework with a final table to provide details on the entire evaluative schema.

3.b.i. Ease of Access: Discovering tools

This scale includes variables that represent the process of discovering available tools. Discovering and accessing available tools includes variables such as:

Ways in which DHCs **identify** tools to users (in terms of language and word choice and visibility on the page)

How DHCs **feature, display, and provide access to** tools on their websites through placement within the website and access to downloading the tool or uploading data.⁵⁴

Table 2: EASE OF ACCESS SCALE

Variable	Component	Poor	Moderate	Excellent
Identification of tools	Word choice	Use of broader term	Use of narrower term	Use of the term "tool"
	Visibility on page	Buried within body of text	Moderately visible	Highly visible
Feature, Display, and Access	Tool placement within website	Buried under multiple pages (clicks)	2-click	1-click
	Downloading	Download link separated from tool description		Download link embedded in tool description
	Uploading	Link to upload dataset/resources separated from tool description		Link to upload dataset/resources embedded in tool description

3.b.ii.
Clarity of Use
–
Enabling the use of tools
We also evaluated the
39

tools on a scale representing the clarity of the intentions and functions of the tool. This scale depends upon variables that represent the process of interacting with a tool after discovery. Clarity of use variables include:

Clarity of tool description: Are the tools functions and target user group clearly and concisely stated? Clear and concise descriptions enable and encourage individuals to use and download the tools.

Clarity of tool operation: Can the tool be previewed? Can most users operate the tool on their systems? Is it clear how users can import or upload their datasets or resources for use with the tool?

Table 3: CLARITY OF USE SCALE

Variable	Component	Poor	Moderate	Excellent
Clarity of description	Function	Function of tool not stated	Function of tool difficult to understand	Function of tool clearly stated in an easy to understand manner
	User Group	Intended user groups not stated at all	User group difficult to understand	Intended user groups clearly stated (by subject, age, discipline, etc)
Clarity of operation	Preview	Tool can not be previewed in any manner	Tool can be previewed via screenshots only	Tool can be previewed via demos
	Technical requirements	Operating system requirements/limitations not provided	Operating system requirements/limitations are murky, hard to find, buried on page	Clear and concise operating system requirements/limitations provided

⁵⁴Exporting the results of data-tool interaction did not seem to be an emphasis in the tools we examined. (For example, tools such as Token X allow users to play with their data on the tool’s site, but without possibility of exporting altered data. However, uploading data is not always a question of uploading data to a tool site. Several tools allow users to download the tool, and *then* upload data to the tool – but everything stays on a user’s computer. This illustrates that there are many possible permutations of downloading, uploading, local and “cloud” computing.

	Technical requirements - additional software	The tool requires additional software HOWEVER does not provide clear statements about these requirements, nor does it provide direct links to the additional software, nor instructions on accessing and installing	[any 2 out of these 3] Clear descriptions on additional requirements Direct links to additional software Instructions on accessing and installing software	The tool does not require any additional software to run -or- The DHC provides clear statements on additional requirements, while providing direct links AND instructions on accessing and installing additional software requirements
	Instructions for download	No instructions are provided on how to download a tool	Instructions are either difficult to understand or not readily accessible	Clear and easy to understand instructions on how to download the tool are provided and readily accessible
	Instructions for data import or upload	No instructions are provided on how to connect data or resources to a tool	Instructions are either difficult to understand or not readily accessible	Clear and easy to understand instructions are provided and readily accessible

3.b.iii. Inter-indexer consistency

To assure inter-indexer consistency, we selected two tools and each researcher (Katie and Lilly) coded the tools independently. After coding, the researchers compared scores. Inter-indexer consistency after the first evaluation was only 32%. To improve our consistency, the researchers identified the points of divergence and discussed reasons as to why they coded the tools differently. Each researcher explained her justification and definitions. Together, the researchers created a granular, detailed definition of each variable to fully standardize the evaluation metrics (see Appendix 3 for the granular scale definitions). After two more rounds of evaluation and discussion, during which the researchers both coded a total of seven tools, inter-indexer consistency reached 100%.

4. Results and Observations

To organize data collection surrounding the variables discussed above, we applied the following data collection instrument to each of the 39 tools. For each variable, we gave tools a numerical score based on the definitions below:

TABLE 4: VARIABLE SCALES

25 Variables Total	POINTS:	0	1	2	3	4
IDENTIFICATION						
1a	Word Choice	Not identified	Broader Term	Narrower Term	Tool	
1b	Visibility	N/A	Buried	List	Featured	
FEATURE AND DISPLAY						
2a	Tool placement on site		Buried	2-click	1-click	
2b	Downloading (1) - Available	No	Yes			

2c	Downloading (2) - Where		Elsewhere	Resources Page	Tool Page	
2d	Uploading (1)	No	Yes			
2e	Uploading (2)		Elsewhere	Resources Page	Tool Page	
CLARITY OF DESCRIPTION						
3a	Function (1) - Stated	No	Yes			
3b	Function (2) - Clear	No	Yes			
3c	Function (3) - Concise	No	Yes			
3d	User group (1) - Stated	No	Yes			
3e	User group (2) - Clear	No	Yes			
3f	User group (3) - Concise	No	Yes			
CLARITY OF OPERATION						
4a	Preview (1) - Available	No	Yes			
4b	Preview (2) - What type	Other (list)	Screenshots	Movies	Demo	All
4c	Support Provided	None	Email	Forums	Tutorial	
4d	Technical Requirements (1) - Stated	No	Yes			
4e	Technical Requirements (2) - Add'l Software req'd	No	Yes			
4f	Technical Requirements (3) - Software links provided	No	Yes			
4g	Technical Requirements (4) - OS	None	1-OS	2 or more OS		
4h	Instr. For Download (1) - Stated	No	Yes			
4i	Instr. For Download (2) - Clear	No	Yes			
4j	Instr. For Download (3) - Concise	No	Yes			
4k	Instr. For Data Interaction (1) - Stated	No	Yes			
4l	Instr. For Data Interaction (2) - Clear	No	Yes			
4m	Instr. For Data Interaction (3) - Concise	No	Yes			

The 39 tools ranged in score from 33 points to 6 points. We calculated the mean and standard deviation for the tools' total scores ($x=17$, $sd=7$). We then used the standard deviation to analyze the overall distribution of the tools and identify how tool groups would be constructed.

Tools scoring 24 points or above became categorized within the highest-scoring group.

Those scoring between 10 and 23 points became grouped within the middle-scoring set.

Those scoring 9 points or less were categorized within the lowest-scoring group.

The highest-scoring group comprised 7 tools, the middle group 24 tools, and the bottom group 8 tools.

Organizing the tools into three distinct sets allowed us to average individual variable scores within each set. This provided a comparison of the major differences among the groups. Table 5b below provides an overview of which tools fell within which groups.

TABLE 5: TOP, LOWEST, AND MIDDLE TOOL GROUPS

Highest Group	Score
Zotero	33
Omeka	30

Sophie	28
Token X	27
Scribe	25
Virtual Lightbox	25
Digital Discernment	24

Lowest Group	Score
CITRUS Collaboratory Gallery Builder	9
Ink	8
Edition Production Technology	7
DySE Generator	7
Video Annotation System	7
Historinet	6
Hass Grid Portal	6
Poster Tool	6

Middle Group	Score
Virtual Humanities Lab	23
Combinformation	22
BATS	21
ScholarPress	21
CommentPress	20
Web Scrapbook	20
Survey Builder	20
Syllabus Finder	19
Media Matrix	19
Collaborative Genealogy	19
Project Pad	18
History Engine	18
Grassroots	18
Poll Builder	17
vrNav	17
Literacy Resource Exchange	16
Tech Ticker	16
English to Greek Word Search	15
Interactive Archeology Knowledge System	14
Collaborative Timeline	14
CUSeeMe Reflector	11
English to Latin Word Search	10
Greek Morphology Analysis	10
Latin Morphology Analysis	10

4.a. Ease of Access

Feature and display: *Word choice* was a major distinguisher of highest-rated tools. Highest-rated tools tended to use the specific word “tool” to distinguish a tool, rather than general terms such as “project” or “resource.” *Tool placement on site* was another distinguishing feature. Highest-scoring tools were often one click away from the DHC’s homepage; bottom tools were 2 or more clicks away. *Visibility* of the tools was universally mediocre. Most DHCs included tools in long lists of projects or resources; only a few DHCs featured tools prominently or separately.

Most tools were available for download or equipped to allow upload of users’ data. A few tools allowed for both. However, among those tools that did provide download or upload capability, *findability of downloading*

or uploading set the highest-scoring tools apart. The lowest-ranking tools suffered from difficult-to-find downloading or upload modalities. In a few cases, downloading or uploading was not available even for tools that had been under development for several years.

4.b. Clarity of Use

Clarity of description: While most tools stated their function, *clarity and conciseness of the functions* set highest-rankings tools apart from lower-rated tools. Similarly, *clarity and conciseness of user group statement* separated tools. While most tools state a user group, the clarity and conciseness of that statement set top-rated tools apart. Tools in the highest-scoring group typically provided clear and concise descriptions of user groups that made it easy to infer who would most benefit from using the tool. Most tools *stated their function* in some form, although as indicated above, few of these definitions were clear or concise. Only three tools did not state their function at all. A slim majority of tools *stated their user group* in some form. Sixteen out of thirty-five tools did *not* state a user group.

Clarity of operation: *Availability and type of preview* was another distinguishing factor. Highest-scoring tools not only made previews available, but used sophisticated interactive previews such as demos rather than static forms like screenshots. Highest-scoring tools had *support provided* in the form of tutorials, forums, and FAQs in addition to providing email support. Highest-rated tools also clearly stated *technical requirements* for using the tool and provided links to any required additional software. Additionally, tools in the top group were more likely to provide cross-platform usability, supporting more than one operating system. Perhaps the most glaring problem was the universal weakness of *clarity and conciseness of download instructions or data interaction instructions*. 29 of 39 tools offered no instructions for download; 22 of 39 offered no instructions for data interaction.

Table 6 below provides a breakdown of all the variables among the three tool groups.

TABLE 6: RANKED AVERAGE SCORE BREAKDOWN

		Top Average	Middle Average	Bottom Average
IDENTIFICATION				
1a	Word Choice	1.9	1.4	0.9
1b	Visibility	1.7	1.6	1.6
FEATURE AND DISPLAY				
2a	Tool placement on site	2.1	1.5	1.3
2b	Downloading (1) - Available	0.9	0.3	0.0
2c	Downloading (2) - Where	2.3	0.9	0.0
2d	Uploading (1)	0.9	0.5	0.0
2e	Uploading (2)	1.4	0.9	0.0
CLARITY OF DESCRIPTION				
3a	Function (1) - Stated	1.0	0.9	1.0
3b	Function (2) - Clear	1.0	0.7	0.4
3c	Function (3) - Concise	1.0	0.7	0.6
3d	User group (1) - Stated	0.7	0.5	0.6
3e	User group (2) - Clear	0.6	0.3	0.3
3f	User group (3) - Concise	0.6	0.3	0.3
CLARITY OF OPERATION				
4a	Preview (1) - Available	0.9	0.8	0.1
4b	Preview (2) - What type	2.4	1.7	0.1
4c	Support Provided	1.9	1.1	0.0

4d	Technical Requirements (1) - Stated	0.7	0.4	0.0
4e	Technical Requirements (2) - Add'l Software req'd	0.7	0.4	0.0
4f	Technical Requirements (3) - Software links provided	0.7	0.2	0.0
4g	Technical Requirements (4) - OS	1.6	0.4	0.0
4h	Instr. For Download (1) - Stated	0.7	0.2	0.0
4i	Instr. For Download (2) - Clear	0.3	0.1	0.0
4j	Instr. For Download (3) - Concise	0.3	0.1	0.0
4k	Instr. For Data Interaction (1) - Stated	0.7	0.5	0.0
4l	Instr. For Data Interaction (2) - Clear	0.3	0.4	0.0
4m	Instr. For Data Interaction (3) - Concise	0.3	0.3	0.0

4.c. Discussion

Overall, the 39 tools surveyed here performed better on variables measuring ease of access than on variables measuring clarity of use. Most of the DHC sites provided adequate to excellent access to tools through appropriate word choices that aid users in identifying tools, and tool placement within the design of the DHC home page that allows users to discover tools while browsing.

However, access to these tools was often impeded by low visibility of, and obscured access to, downloading and uploading features. Clarity of use was a widely problematic dimension of existing tools. Statements summarizing the basic functionality of a tool appeared to be the most frequent technique employed by tool developers to clarify tool use. However, the highest-scoring tools also supplemented these descriptions with: (1) detailed statements documenting technical requirements for tool use; (2) sophisticated previews to allow users a sense of the look, feel, and interaction with the tool; and (3) additional support for users in the forms of tutorials, FAQs, manuals, or forums.

Additionally, we noticed a few problems not captured in our variable scale, but worth remarking upon. As we progressed through our evaluation, we came across the phenomenon of *orphan tools*: tools that are operational but not linked to or referred to by their DHC in any way. MSU's Media Matrix and four translation tools authored by the Perseus project (5 tools total) are not linked from their DHC sponsor's websites.

Next, a number of tools do not feature download or upload capabilities because they are not ready for public consumption. For newer tools (such as MSU's Interactive Archeological Knowledge System), this is quite understandable, but some of these tools seem to have been under development for quite some time. Tools such as CITRIS Collaborative Gallery Builder, HASTAC's Video Annotation System, MSU's Ink, and Stanford Humanities Lab's Historinet are not ready for public use though they have been under development for several years.

Finally, we noticed a number of tools that appear to be abandoned by their creators. Often the code is available for other developers to work on, but there is no further development occurring at the DHC. Examples include the Ancient World Mapping Center's BATS, Matrix's Project Pad, and STG Brown's Virtual Humanities Lab.

5. Recommendations

Based upon this evaluation, we offer a number of recommended best practices for tool design for humanities scholars.

- (1) **Feature tools.** Highlighting tools using web design and language draws desired users to the software a DHC spent time and effort developing. Best practices for featuring tools include using appropriate word choices. A more specific term like 'tool' allows users to find and use relevant software more

quickly. Another important measure is featuring the tool on the DHC's website using design techniques, rather than burying the tool in a bulleted list of projects or resources.

- (2) **Clarify your tool's purpose and audience.** Users investigating a tool need to know both the intended function of the tool, and whether the tool is appropriate for their uses. Clear, concise information about a tool's purpose and audience will help users make this decision.
- (3) **Make previews available.** The more a user can find out about a tool in advance of downloading or uploading their data, the better. The use of screenshots, tutorials, or demos can help provide users with helpful information regarding the look, feel, and interaction with the tool.
- (4) **Provide support.** Including an email address for users who have questions is a start, but FAQs and searchable forums are valuable tools for clarity and successful tool operation.
- (5) **State technical requirements.** Users need to know if they can download or use a tool with their current technology. State and provide links to any additional software needed to assist users to make this judgment. If your tool needs nothing but a web browser in which to run, say so! Enable use through clear requirements.
- (6) **Provide clear, easy instructions for download or data interaction:** This is a critical step for clarity of tool use, and was almost universally lacking in our sample of tools. Without directions, users will have trouble installing your tool, or uploading their data for use with your tool.
- (7) **Plan for sustainability.** Making the tool available after a grant period has run out is a major challenge. During tool creation, plan for how a tool will be made available to users – and even iterated and improved – after the development period has ended.

6. Lessons Learned and Implications for Future Research

From the very beginning of this project, the term “tool” proved slippery and problematic. Digital Humanities Center sites featured projects, resources, software, and occasionally “tools” – but it was difficult to determine the *parameters* that lead to an identification of a tool. This led to a lengthy definition-building process at the beginning of this research. We hope the elements of a “tool” that we have delineated (objectives, site of development, and associated resources) can introduce precision and enable greater rigor in any subsequent research.

There are also several limitations in this research that we recommend be addressed in future projects. Given the scope of the larger project within which this evaluation was embedded, we only considered identification, features and display of a tool *within* a DHC site in the notion of findability. As such, this view disregards tool findability from outside of the centers via search engines, browsing, etc that may more accurately reflect how everyday user scenarios. This broader concept of findability bears on several structural issues, including search engine functionality, metadata associated with tools, and DHC site structure. The implications of a broader study of findability is a fertile area that could potentially expand our understanding of the relationship between DHCs and tools, as well as digital tools' ability to function as viable components of an emerging cyberinfrastructure.

Additional limitations of our evaluation schema became apparent during our analysis of the data. For instance, our evaluation scales favor complex tools that require either uploading of data or downloading of the tool. Tools that were quite simple, for example the web-based Syllabus Finder from George Mason University, were at a disadvantage in this schema. Though we believe Syllabus Finder to be a very helpful and elegant tool, because it was entirely web-based, it received low downloading and uploading scores.

Additionally, it received a low score in clarity of operation, particularly under questions of technical requirements, because there was little need for the sole requirement—a web browser—to be stated. This particular case suggests that there may be varying models of visibility and usability for web-based versus downloaded tools. As web-based applications become increasingly popular, we should reexamine what sorts of documentation and technical specification should be provided.

While our report illustrates a first level of usability for digital humanities tools – access and clarity – we believe there may be an important second level of usability of these tools based upon the field’s objectives for tool-based research. A future research question to pursue may be: How well do existing DHC tools respond to the criteria of, and uses for, "tools"? As our research questions focus primarily on questions of accessibility and clarity, we exclude tool objectives from our current evaluation of digital tools. We suggest that researchers consider these criteria for further evaluation, as they may provide more insight into the *quality* of existing tools, and into future development needs in the digital humanities.

Additionally, early on in the project, we identified questions of institutional support as a valuable factor in defining use and access. This line of inquiry generated additional variables for consideration and additional scales for analyses, however after careful consideration the researchers felt this particular question would be beyond the scope of the project and perhaps more useful for follow-up analysis. Appendix 2 provides the scales and variables associated with this question for possible future use.

7. Bibliography

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8. Appendices

Appendix 1: List of Identified DHCs

American Social History Project - Center for Media and Learning	http://www.ashp.cuny.edu/
Ancient World Mapping Center	http://www.unc.edu/awmc/
ArchNet	http://archnet.org/lobby/
Center for Digital Humanities, UCLA	http://www.cdh.ucla.edu/
Center for Digital Research in the Humanities, University of Nebraska	http://cdrh.unl.edu/about/activities.php
Center for History and New Media, George Mason University	http://chnm.gmu.edu/
Center for Literary Computing, West Virginia University	http://clc.as.wvu.edu:8080/clc/

Center for New Designs in Learning and Scholarship, Georgetown University	http://cndls.georgetown.edu/
Collaboratory for Research in Computing for Humanities, University of Kentucky	http://www.rch.uky.edu/
Computer Writing and Research Lab, University of Texas at Austin	http://www.cwrl.utexas.edu/
DXArts, Center for Digital Arts and Experimental Media, University of Washington	http://www.washington.edu/dxarts/
The Doreen B. Townsend Center for the Humanities at UC, Berkeley	http://townsendcenter.berkeley.edu/
Experimental Technologies Center, UCLA	http://www.etc.ucla.edu/
HASTAC	http://www.hastac.org/
Heyman Center for the Humanities at Columbia University	http://www.heymancenter.org/
Humanities Computing, Division of the Humanities, University of Chicago	http://hum.uchicago.edu/frankeinstitute/
IATH – Institute for Advanced technology in the Humanities	http://www.iath.virginia.edu/
Illinois Center for Computing in Humanities, Arts and Social Science	http://www.chass.uiuc.edu/
Institute for Multimedia Literacy, University of Southern California	http://iml.usc.edu/html/about_us/history.htm
Maryland Institute for Technology in the Humanities	http://www.mith2.umd.edu/
Matrix - The Center for Humane Arts, Letters and Social Sciences Online	http://matrix.msu.edu/
MERLOT	http://www.merlot.org/merlot/index.htm
National Humanities Center, Research Triangle Park, NC	http://nationalhumanitiescenter.org/
Perseus Digital Library	http://www.perseus.tufts.edu/
Scholarly Technology Group – Brown University	http://www.stg.brown.edu/
Stanford Humanities Lab	http://shl.stanford.edu/
The Institute for the Future of the Book	http://www.futureofthebook.org/
University of California Humanities Research Institute	http://www.uchri.org/
Virginia Center for Digital History	http://www.vcdh.virginia.edu/index.php?page=VCDH
Visual Media Center	http://www.mcah.columbia.edu/
Women Writer’s Project	http://www.mcah.columbia.edu/
Writing in Digital Environments, Michigan State University	http://www.wide.msu.edu/about

Appendix 2: Tools as Cyberinfrastructure, Institutional Support

We believe a future project could evaluate the 39 tools explored here on a scale that represents the nature of the institutional support for the tool. We will use this scale to provide a descriptive account of the types of institutional support that tools have from DHCs. Describing institutional support for the tool includes:

- A DHC's roles of responsibility for the tool
- The level of community collaboration surrounding a tool

CYBERINFRASTRUCTRE SCALE

Variable	Component	Poor	Moderate	Excellent
Responsibility for tool	Creator Distributor Steward	Creator, distributor and steward are not indicated	One or two of these roles are indicated.	Creator, distributor and steward are clearly indicated
Community support for tool	Creatorship Distribution Stewardship	Among jointly-authored tools, responsibility for creation, distribution and stewardship are not indicated	Among jointly-authored tools, responsibility for creation, distribution and stewardship is fuzzy	Among jointly-authored tools, responsibility for creation, distribution and stewardship are clearly indicated

Variable Overview

Variable: Responsibility for Tool	a. Creator-Author b. Distributor c. Steward		DHC credited as author DHC makes tool available DHC is the contact for tool questions, problems
Variable: Community Collaboration on Tool	a. Creatorship b. Distribution c. Stewardship	Single DHC More than one DCH Outside community	DHC is only org credited as creator, distributor or steward Collaboration is credited as creator, distributor, steward Outside community entity credited as creator, distributor, steward

Appendix 3: Scales and Definitions

Questions and Variables	Scales and Definitions				
1a. Word Choice	Not identified The broader DHC site has not used a specific term to categorize and identify the item	Broader Term terms include: projects, activities, research, resources	Narrower Term these are terms that have a more technological orientation, including: software, others?	Tool the specific use of the word tool to label and categorize the specific item	
1b. Visibility	Not applicable DHC site does not provide access to a tool	Buried There is no distinct navigation marker to indicate where users can find the tool, but the tool is in fact available	List From the DHC home page, the various resources are grouped and listed together under particular headings, either on side panels of webpage, or within	Featured There is a direct link provided from the first/home DHC page so that users do not have to click to subpages to	

		on the site	body of homepage. This can either be a one click or two click depending on the construction of the page (i.e. tabs that create separate lists of tools would be a two click, however a list within body of homepage would be a one click)	access the tool or information about the tool. Typically the name of the tool will be prominently displayed and will not necessarily be categorized within a heading.	
2a. Tool Placement	Buried From the DHC home page, the tool can be accessed in more than two links-clicks	Two-click From the DHC home page, the tool can be accessed in two links-clicks	One-click From the DHC home page, the tool can be accessed in one link-click		
2b. Downloading-Available	No Users are unable to download a version of the tool to their personal computers to use from their desktop	Yes Users are able to download a version of the tool to their personal computers to use from their desktop			
2c. Downloading-Where	Elsewhere A link is provided to download the tool from any other type of webpage, aside from the project page and splash page	Resource Page A link is provided to download the tool from a page that lists multiple tools-resources	Tool Page A link to download the tool is provided		
2d. Uploading-Available	No Users unable to contribute their own data to be used with the tool	Yes Users are able to contribute their own data to be used with the tool			
2e. Uploading-Where	Elsewhere Users can contribute their own data to be used with the tool from a page other than the project page or splash page	Resources Page Users can contribute their own data to be used with the tool from a page that lists multiple tools-	Tool Page Users can contribute their own data to be used with the tool from a single site that is dedicated to providing information about the tool.		

	(perhaps when tool is downloaded, people can contribute their data from their own personal computers)	resources			
3a. Function- Stated	No The purpose and intended functionality of the tool is not articulated in any fashion	Yes The purpose and intended functionality of the tool is articulated			
3b. Function- Clear	No The purpose and intended functionality of the tool is articulated in a such a manner that <i>naive users</i> can not understand	Yes The purpose and intended functionality of the tool is articulated in a such a manner that <i>naive users</i> can understand			
3c. Function- Concise	No The purpose and intended functionality of the tool is lengthily described, in a roundabout manner	Yes The purpose and intended functionality of the tool is articulated succinctly			
3d. User group-Stated	No The intended audience and tool user group is not articulated	Yes The intended audience and tool user group is articulated			
3e. User group - Clear	No The intended audience and user group is articulated in such a manner that naive users are unable to identify who will benefit from its use	Yes The intended audience and user group is articulated in such a manner that naive users are able to identify who will benefit from its use			
3f. User group - Concise	No The intended audience and user group is lengthily described, in	Yes The intended audience and user group is articulated succinctly			

	a roundabout manner				
4a. Preview - Available	No Site does not provide preview of the tool, where preview is defined as visible representation of the tool that allows users to get sense of its "look and feel" and interaction	Yes Site provides preview of the tool, where preview is defined as visible representation of the tool that allows users to get sense of its "look and feel" and interaction			
4b. Preview - What type	Other Any other representation of the tool that the site provides to give users a sense of the look and feel of and interaction with the tool	Screenshots A screenshot is a static representation of the tool that provides users with a sense of the look and feel of the tool	Movies/animations Site provides a dynamic representation of a tool that provides users with a sense of the look and feel of the tool	Demo Demo is a sample representation of the tool that allows users to interact with the tool, even if in a limited manner	All Site provides both a screenshot and demo preview of the tool
4c. Support provided?	None	Tutorial Site provides how-to on tool use, such as screenshots accompanied by step-by-step directions; or a movie or animation demonstrating tool use	Forums Searchable FAQ or discussion lists about the tool.	Email Address provided to email questions	Live Phone number or other way to have a conversation with a human
4d. Technical Requirements - Stated	No Specs needed to run the software - memory requirements, OS, etc - are not articulated	Yes Specs needed to run the software - memory requirements, OS, etc - are articulated			
4d. Technical Requirements - Add'l Software	No The site does not state whether additional software is needed to run the tool.	Yes The site states whether additional software is needed to run the tool.			
4e. Technical	No	Yes			

Requirements - Software Links Provided	If additional software is needed, site does not include links to that software.	If additional software is needed, site includes links to that software.			
4f. Technical Requirements - OS	None stated	Only 1 OS	Two or more OS		
4g. Instr. Download - Stated	No The site does not include instructions for downloading the tool.	Yes The site includes instructions for downloading the tool.			
4h. Instr. Download - Clear	No Instructions for download are articulated in such a manner that naive users are unable to successfully download the tool	Yes Instructions for download are articulated in such a manner that naive users are able to successfully download the tool			
4i. Instr. Download - Concise	No Instructions for download are described at length or in a roundabout manner	Yes Instructions for download are articulated succinctly			
4j. Instr. Data - Stated	No The site does not include instructions for users to incorporate their own data.	Yes The site includes instructions for users to incorporate their own data.			
4k. Instr. Data - Clear	No Instructions for users to use their own data are articulated in such a manner that naive users are unable to successfully use the tool	Yes Instructions for users to use their own data are articulated in such a manner that naive users are able to successfully use the tool			
4l. Instr. Data - Concise	No Instructions for data use are described at length or in	Yes Instructions for data use are articulated succinctly			

	a roundabout manner				
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