ECAR

Building Capacity for Digital Humanities

A Framework for Institutional Planning

ECAR WORKING GROUP PAPER

MAY 2017

cni
Coalition for Networked Information

EDUCAUSE CENTER FOR ANALYSIS AND RESEARCH

E D U C A U S E

Table of Contents

Developing institutional strategies for the support of digital humanities will accelerate the initiation and growth of sustainable programs that add value for practitioners of digital humanities and for the institutions within which they work.

Introduction

A growing number of researchers in the humanities are using computational tools and methods that are more typically associated with social and scientific research. These tools and techniques enable researchers to pursue new forms of inquiry and new questions and bring more attention to—and cultivate broader interest in— traditional humanities and humanities data. Analysis of large data sets and digitized content, data visualization, text mining, and statistical analysis of humanities data are just some examples of the burgeoning areas of digital humanities (DH) research. While DH is most often associated with computer-aided research in the humanities, there is a growing area of DH that focuses on pedagogy and embedding DH projects in undergraduate and graduate instruction. Another aspect of DH research—which we will not address in this paper— focuses on a social and cultural critique of new media and technologies and may also address socioeconomic issues of how the work of digital humanities is done.

What Is Digital Humanities?

The term "digital humanities" has been evolving for several decades and often describes the application and/or development of digital tools and resources to enable researchers to address questions and perform new types of analyses in the humanities disciplines. This paper focuses on how to support humanists and provide them with tools to conduct DH research.

As a field of research and instruction that continues to take shape, DH is happening in different ways and places throughout academic institutions, and its practitioners are found in a broad range of departments, programs, technology groups, and libraries. DH comprises faculty in programs formally designated as DH, faculty who identify as DH scholars and work in traditional departments, and scholars who are doing work that could be considered DH but who may not self-identify as digital humanists. Technology experts in areas formerly not associated with the humanities—such as GIS, 3D modeling, data modeling, or high-performance computing—are usually distributed across the institution to support a variety of scholars in different scientific or social disciplines. DH needs typically diverge from standard research computing services offered by campus IT; where those services are available, they are also often not recognized as being applicable to humanities scholarship or might not be known to humanities scholars. As a result, institutions may look to

build a separate DH initiative to effectively support this work, or they may look to connect extant expertise and services in a way that better supports the scholars and students of DH on campus. DH centers emerge because the scholars themselves are in departments across the campus. Libraries' digital services may support some aspects of DH work, such as providing digitization services and consultation on project management, metadata, and intellectual property, but they may not offer a comprehensive set of services or have the expertise available that is required in all relevant areas. On some campuses, the central IT department provides the technology infrastructure and the library provides consultation services for DH.

Some universities and colleges have well-developed DH centers, often focused on a small number of projects and led by established DH faculty. Others may be in the process of developing digital scholarship centers or labs, often hosted in a library and involving IT partners and others to provide a broad array of support. However, many institutions are just beginning to explore this area and still struggle with how best to engage with this growing field; as a result, they often provide varying levels of administrative and faculty support. It is important to have clarity as to institutional priorities and goals for DH (if any) and the commitment to provide the requisite support to achieve them. As digital humanities scholarship has developed over the years, the legitimacy of DH products as scholarly work has been questioned by some researchers, and some scholarly societies are addressing this issue. One aspect of legitimacy of scholarship is the capability to preserve the products of research, and libraries play a critical role in this arena.

This paper outlines a practical framework for capacity building to develop institutional DH support for IT staff, librarians, administrators, and faculty with administrative responsibilities. All major facets of capacity building are discussed—including organizational models, governance, human and technical infrastructure, and the cultural shift from a solo-practitioner research model to one based on collaboration—and each facet is described in three stages of capacity: *early stage*, *established*, and *high capacity*. These stages are designed to be applicable regardless of the institution type, the chosen organizational model, or the specifics of campus partnerships involved and to simultaneously recognize that it is not realistic for all institutions to expect to attain high capacity in all facets of their program. For each stage, the paper targets an actionable level of detail, striking a practical balance between high-level goals and on-the-ground

operational issues. Support of DH, like support for technology-intensive science and social science research, is expensive, time consuming, and resource intensive.

We acknowledge that scholars are already doing innovative digital humanities research and teaching, acquiring their own funding, developing skills through national- and international-level training institutes, hiring their own assistants, and individually grappling with complex issues such as scalability, archiving, and preservation. However, developing support at an institutional level can lower the barrier to entry for a larger and more diverse group of scholars to adopt DH tools and methodologies. Institutional support is particularly helpful when scholars want to apply well-established techniques within a new discipline or to a new set of research questions or courses. Central support at an institution can also take advantage of economies of scale by coordinating software license purchases to leverage bulk discounts, determining which technology platforms will be supported, or establishing digital preservation practices that apply broadly. Institutional capacity building for DH also facilitates the all-important connections between scholars, technologists, and librarians that are fundamental to the collaborative nature of DH practice. For some aspects of DH support described in this paper, few if any institutions have reached the high-capacity level, but the paper describes what could distinguish high levels of performance from established and early-stage efforts.

It is important to note that, while this paper uses the term *digital humanities* throughout, the issues and framework described here are not uniquely tied to the humanities. At the home institutions of many working group members, support for DH includes outreach to the social sciences and humanities-adjacent fields including architecture, archaeology, geography, information studies, and sociology and is often captured under umbrella terms such as *digital scholarship*, *computational science*, *social science*, or *data science*.

Getting Started

The early stages of developing institutional DH support are often characterized by a series of small-scale, ad hoc efforts. Many institutions start by surveying local efforts and peer institutions to understand where activity is happening and what the opportunities are for coordination and collaboration. Once local efforts and potential partners are identified, a needs assessment and an evaluation of the suitability of existing services can begin to shift efforts from various ad hoc means to more defined processes that can be followed consistently. This baseline

assessment is a recognizable sign of maturing institutional support and capacity for DH. Furthermore, as a support program matures, these early efforts at establishing a baseline make it possible to evaluate whether institutional efforts are successful at achieving defined goals for DH (and, moreover, to ensure that there *are* goals and that the organizations involved in the program agree with and support those goals) and to ensure that the structures and processes in place remain relevant as needs and interests evolve.

Environmental Scan and Needs Assessment

A prerequisite to expanding institutional support for digital humanities is an understanding of the local DH landscape, as well as the landscape at peer institutions. Needs assessments benefit from a person or team familiar with the national and international DH ecosystem (through resources such as mailing lists, conferences, Twitter, and others; see Appendix A). This broader perspective can be helpful in alerting local stakeholders to opportunities, challenges, and controversies in the field.[1]

Local Landscape

The scope and nature of an institutional needs assessment in the early stages of developing a support program for digital humanities will vary widely based on the information available to stakeholders (such as from previous, related surveys about IT support, including the EDUCAUSE student and faculty technology surveys[2] or smaller local efforts). Although it can be valuable, information such as which scholars are doing work relevant to digital humanities will most likely be unavailable through general-purpose surveys. At a campus in the early stages of developing capacity for digital humanities, this information is best acquired through informal channels. Browsing archives of campus event calendars to identify past events with potential relevance to digital humanities and following up with event organizers through a face-to-face discussion can help uncover potential leads. Talking with individual IT staff or librarians who are recognized as "local DH experts" about who they've consulted with is another promising approach. It can also be effective to inquire with the institution's office of sponsored projects for information on who has applied for grants from agencies that fund digital humanities work, such as the National Endowment for

> **Digital Scholarship Roadmap at UH**
>
> In 2016, the University of Houston Libraries developed a digital scholarship roadmap based on a wide-ranging needs assessment of the local landscape. The assessment led to recommendations for four phases, including the development of a digital scholarship center.

the Humanities, the Office of Digital Humanities (NEH-ODH) in the United States, or the Canadian Social Sciences and Humanities Research Council (SSHRC). Organizations such as Compute Canada and XSEDE also have dedicated DH support members. Humanities deans may also have valuable leads, based on who has asked for their support for digital endeavors. Deans, department chairs, and graduate admissions reviewers may also have information about (graduate) student research interests in the digital humanities, including whether any faculty are mentoring such student research.

Current DH practitioners on a campus are one of the most valuable resources for informing an emerging community of practice, and cultivating relationships with those individuals is an important step in an institution's needs assessment. Connecting with these scholars through face-to-face conversations about their work, what campus resources they currently use, and their ideas on how the institution could improve support for digital humanities work is time consuming but important, not only to glean information but also to lay the groundwork for involving those scholars in DH capacity building efforts (e.g., through serving governance bodies) going forward.

Nationwide Needs Assessment at UBC

The University of British Columbia is conducting a nationwide, multi-institutional survey of research data management practices and future needs during the 2016–17 academic year. This needs assessment survey, being conducted with the Canadian Social Sciences and Humanities Research Council, includes a number of questions that directly relate to how technology is employed in research within the humanities and social sciences.

Current digital humanities practitioners can provide an on-the-ground perspective about existing campus services that could be better coordinated to foster digital humanities work. Surveying service providers may provide a different set of responses about potentially relevant services. The responses from current practitioners and service providers may reveal support gaps and unmet needs.

A comprehensive needs assessment is context dependent, examining the particular academic and support strengths of the institution. Most institutions do not have the resources to excel in supporting all digital tools, methods, and disciplines equally well. While providing broad but shallow expertise is one way to address the resources/needs gap, another is to further invest in existing areas of strength in order to provide deep support in focused areas—areas that are, ideally, aligned with institutional priorities and strengths.

Peer Landscape

A scan of peer institutions can provide inspiration, motivation, and a rationale for resource allocation for local DH efforts. For institutions that see attracting new faculty as a key motivating factor for strengthening institutional support for digital humanities, it is important to understand efforts at peer institutions. When peer institutions are in the early stages of developing support, it may not be enough to simply search for relevant information on the institution's website, although a web search is a useful starting point. In almost all cases, a wealth of insight can be gained through a conversation with a key stakeholder or participant in the digital humanities community at a peer institution. Here, too, searching departmental and institutional event calendars for lectures and workshops in areas related to DH can reveal some level of capacity, as well as contacts with whom to follow up and learn more about DH at that institution. The ethos of collaboration and information sharing that has often been associated with digital humanities commonly extends to individuals who engage in digital humanities work, and even "cold" requests sent to general-purpose e-mail accounts are likely to receive a response.

National Landscape and Beyond

In addition to in-person support structures there is an extensive network of DH resources—both human and technical—with which scholars can connect online. Scholars at smaller institutions, graduate students, and scholars in small sub-fields are particularly likely to seek out community, collaboration, and technical help through online communities. Twitter is widely used for general information exchange and discussion within the international community of digital humanities practitioners. Many scholars, librarians, and IT staff also monitor one or more active DH mailing lists. There are also numerous volunteer-curated sites that aggregate the highlights of news, jobs, debates, Twitter feeds, and thoughtful blog posts (see Appendix A). DH training institutes (including the Digital Humanities Summer Institute and HILT [Humanities Intensive Learning and Teaching]) build communities that persist after the conclusion of the institute. There are also DH communities that support DH work that exist entirely online (such as HASTAC). While travel to the international Digital Humanities Conference, sponsored by the Alliance of Digital Humanities Organizations (ADHO), may be beyond the means of scholars in a given year, regional DH organizations and conferences are springing up throughout the United States.

Interdisciplinarity

By definition, the digital humanities are interdisciplinary, requiring skills and methods from a number of disciplines. Rick Szostak defines interdisciplinarity as a set of practices that ask research questions unconstrained by theories, methods, or phenomena; draw upon diverse theories and methods; connect concepts and results across multiple disciplines incorporating insights from different disciplinary perspectives; and integrate the insights into a holistic understanding.[3] Digital humanities is an excellent example of this kind of interdisciplinarity, as most DH projects require multiple participants from various fields. It is generally unreasonable to expect one person to possess all of the required knowledge and skills to carry out the project alone.

The interdisciplinarity of the digital humanities reflects both challenges and opportunities. Matching a scholar's research with corresponding methods from other disciplines and finding like-minded and open-minded collaborators is a common dilemma because it is rare to find somebody with all the skills required. This challenge also may yield many opportunities to explore new material and methods. This challenge of collaboration is the corollary difficulty of bridging perspectives and mapping the jargon and definitions from various disciplines related to the project. Before any meaningful DH collaboration can begin, collaborators frequently need to learn material outside their discipline and form a collective understanding of the problem and methods that may be used. Although each collaborator does not need to be an expert in all aspects of the project, a common language is required to allow the collaborators to communicate.

As DH collaborations become more established, practitioners can use their common language and understanding to expand their opportunities to incorporate new methods and concepts from other disciplines. More experienced DH collaborators create shared understandings about their work and ask meaningful questions to avoid misunderstandings and assumptions. While moving toward this level of competence, it is important for collaborators to ask for clarification, remain patient with each other, and be open to examining disciplinary assumptions. This opens up the opportunity of interdisciplinarity that is grounded in the fact that few solo practitioners have the necessary scholarly, methodological, and technical skills to do digital humanities alone.

At the highest-capacity DH institutions, there are experienced interdisciplinary teams that can help scholars at any level, from novice to expert. High-capacity DH institutions strategically invest in fostering interdisciplinary collaborations across

multiple disciplines and their perspectives. This might be done by providing additional staff, physical space, or funding to enable open and unconstrained collaboration (see the section on roles and capabilities below).

As a way to be more inclusive, some institutions use the overarching term *digital scholarship* and include digital humanities as a subset. Some do it for political reasons. Some do it for fiscal reasons. Because librarians and IT staff are common contributors to DH projects, it may be easier to find funding or administrative support by using the *digital scholarship* moniker.

Like DH, *data science* is another emerging area on many campuses that brings scholars together across disciplinary lines, potentially incorporating research questions and concerns from the humanities as well as the social sciences, computer sciences, math, and statistics. While the choice of a program's name can have ramifications, the framework described here is applicable for any institution that wishes to increase its capacity to support research and pedagogy that leverages digital tools and methodologies, whether in the humanities or elsewhere.

DH Partnerships

Building institutional capacity for digital humanities can have the positive effect of lowering the individual effort and risk involved for researchers and instructors who want to explore the adoption of new tools or methodologies. The reduction of effort and risk results from the clarification of resources and assistance available and the coordination of those offerings across administrative boundaries (e.g., ensuring that content management systems recommended by campus IT groups can be effectively archived by the library). Before an institution can fully embrace DH support, a fundamental change in institutional culture is required. Particularly within the humanities, there is a traditional conception of lone scholars conducting their research and/or pedagogy, supported by an anonymous cast drawn from the library, IT organizations, and educational technology groups. In the early stages of DH services, this model may be replicated, where departmental or organizational IT staff play an important role in supporting DH work but are

> ### Regional Symposia
>
> Recognizing the need for a DH event explicitly focused on the human, technical, and institutional infrastructure that makes DH work possible, UCLA's Center for Digital Humanities has twice hosted the DH Infrastructure Symposium, with attendees largely from Southern California. In addition, the University of Utah recently hosted the second annual Digital Humanities Symposium Utah (DHU2), bringing together over 100 DH scholars from around the Mountain West region.
>
> These and similar kinds of regional events, such as THATCamp, offer access to a ready community of DH practitioners eager to share and learn from each other. As such, they provide opportunities ripe for connecting with others "doing DH" and reveal the extent to which institutions in one's area or peer group are able to generate and sustain DH work.

perceived as service providers rather than partners. A more mature DH institutional culture is one that recognizes that many forms of DH work—particularly those that involve computationally intensive and/or data-intensive analysis—are most effectively implemented through partnerships between individuals with diverse skill sets. In these cases, the role of librarians and IT professionals is not simply to provide access to resources or to produce code according to predefined specifications. Instead, DH work becomes a partnership that provides access to a different kind of valuable expertise, starting with the project design. Partnerships that span discipline, domain, and institutional roles require ongoing effort on behalf of all parties, particularly around communication. Discipline- or domain-specific language must be explained, assumptions about the subject area and the technologies selected must be explicated, and a common understanding of the project's goals, needs, priorities, and roles must be reached in order to minimize friction and maximize success when a project moves forward (see the section on roles and capabilities below for further discussion).

While such partnerships are often formed within institutions, they are also frequently interinstitutional because that is the only way for the requisite skills or resources to be acquired. There are even some grants that set interinstitutional collaboration as a requirement.[4] This is an important point for institutional administration teams to be aware of because it stands to change the nature of the support that they provide away from general research support toward specific cases of support that will make researchers at their institution better able to contribute to collaborative projects.

The sources of potential partners who will support the transition to more institutionally supported digital humanities are numerous and varied and will depend on the specific strengths and culture of the institution. The library and IT organizations (central and/or departmental, research-oriented and/or pedagogy-oriented, infrastructure-oriented and/or consultation-oriented) are common sources of collaborators. Research computing groups that have traditionally focused on the humanities are increasingly seeing the importance of expanding the range of users who can benefit from their services and may be particularly enthusiastic about partnering on projects that involve large computation or data-management challenges. Digital humanities programs at some institutions can find fruitful partnerships with departments outside the "traditional humanities," including architecture, archaeology, computer science, geography, public policy and public health, mathematics, sociology, and anthropology. Research support

organizations, even those with a specific departmental focus, may be enticed to broaden their scope to facilitate digital humanities collaboration.

Staff affiliated with museums and archives on or adjacent to campus may be another resource. Many museums and archives are keenly interested in innovative uses for their collection materials, and if their holdings align well with a researcher's focus, this can form the foundation for a particularly mutually beneficial partnership. Organizations that focus on innovative teaching—even if technology is not explicitly part of their scope—may also be interested. In addition to formal organizations for innovative teaching, there are also faculty and graduate instructors who experiment with ad hoc forms of "digital pedagogy" or "digital learning" using freely available digital tools and platforms. While these practices are not always tied directly to the digital humanities, practitioners are often poised to be more receptive toward participating in DH communities or collaborations.

Scaling up DH support to involve collaborators outside the immediate academic discipline may have its challenges but also presents numerous opportunities. Even within the humanities, there are unresolved debates around the promise—or threat—that digital humanities brings to the fundamental goals and practices of the humanities. These discussions frequently spill over into the public forum through op-eds written for major newspapers.[5] Outspoken faculty critics can act as intractable roadblocks to institutionalizing DH support. Even with the support of relevant deans, one or two proponents of digital humanities may not be enough to overcome department resistance toward the critical early steps necessary for building institutional support and a more collaborative culture. These steps include approving DH courses, requiring DH experience in faculty recruits, or valuing their students' or peers' DH scholarship as part of their studies or the tenure and promotion process. Institutions facing these challenges will have to work toward better understanding and addressing these resistances—which may stem from concern over resources as much as a preference for traditional scholarship—in order to create the necessary institutional space for DH practices to flourish.

Organizational Models

As part of the process of transitioning from an early to a more established stage, it can be useful to identify an organizational model that can serve as a framework for program development. This section describes four well-defined models—

centralized services, hub and spoke, mesh network, and consortial—and explores the environments to which these models are best adapted.[6] The results of the needs assessment will inform decision-making about organizational models. Before detailing the different models available, it is important to note, as reported in the CNI workshop report *Digital Scholarship Centers: Trends & Good Practice*, that "engagement with constituents as partners, not as clients" is key to success and growth.[7] The report also notes the importance of having a plan for sustainability, which is essential regardless of the model chosen.
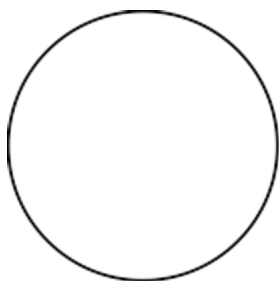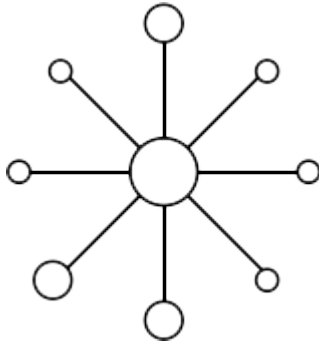
Centralized Services Model

A centralized services model focuses on meeting faculty and student needs by housing most or all DH services in a centralized unit, which may also include services directed at other disciplines.[8] In this model, collaboration across disciplines—although still a challenge—is fostered more easily, especially if there is a physical space where practitioners can rub elbows and share insights. Examples of this model include DH centers or organizations that are set up by a school, division, or program such as the library to directly support DH. For example, the Alabama Digital Humanities Center, located in the Gorgas Library at the University of Alabama, brings together researchers, equipment, expertise, and opportunities to collaborate in one space. These models typically involve faculty or staff members dedicated to supporting DH initiatives full time. This model can function well at any size institution, given appropriate staffing. Advantages to this model include:

- Ease of entry for new practitioners
- Better awareness of all DH initiatives on a given campus
- Cohesion of training offerings
- Coordination of external application efforts

Perhaps the most significant disadvantage of this model is that a centralized DH center may become hyper-specialized in one area, leaving those outside that area feeling excluded.[9] It is hard to hit a sweet spot between broad offerings of expertise and training to serve a diverse community with detailed knowledge that can truly benefit collaborators who are already subject experts. However, having solid digital and staffing infrastructure in place to address digital humanities on a campus level leverages the expertise found across an institution. Another concern

is that centralized services for DH should not be a silo of similar services already offered by the library or IT.

Hub-and-Spoke Model

The hub-and-spoke model includes a strong central node that links to many other resources.[10] In this model, knowledge, expertise, personnel, and services are embedded in academic departments, interdisciplinary units, libraries, or other service points around campus and are connected and coordinated through a central node. For example, at Stanford University, hubs are established in the Center for Spatial and Textual Analysis (CESTA) and the library. Scholars who have DH expertise serve as spokes and are housed within academic departments and affiliated with the library. The University of California, Berkeley hub exists in the Digital Humanities at Berkeley program, which also draws on staff from D-Lab, the central research IT group, the main and special collections library, and an educational technology group.

One advantage of this model is that it allows growth to happen organically. Services and expertise develop where they are needed, rather than faculty and students depending on a centralized unit that may lack the resources to meet their ever-evolving needs. Distributed knowledge and skills, however, may make it difficult to identify where to go for specific services, training, or assistance. To combat the confusion this may cause, it is best to have at least a centralized digital presence that links out to the various "spokes" around the campus. This model can work for institutions of any size but may be ideally suited to small campuses that have allocated funds to hire faculty and staff dedicated to support DH full time.
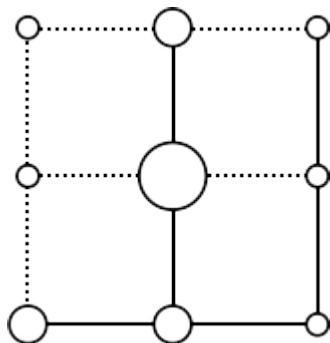
Mesh Network Model

In the mesh network model, no one unit is dominant. Instead each unit that offers DH services—e.g., the library, IT, or academic departments—pools knowledge to create a linked network of units, groups, and practitioners who contribute their expertise to the overall pool. While this meshed model may not be as

cohesive as in the centralized model, each unit can specialize in what it does best, whether that is a specific research field, technology infrastructure, or information architecture.

Advantages include deep knowledge and expertise within each unit, redundancy, and opportunities for enhanced collaboration. Researchers' needs are often met locally within their home departments. This model can work with any institution size, but larger institutions may find that a proliferation of units requires some oversight to avoid confusion about which unit is responsible for services, as well as the needless replication of some services. For new DH practitioners at an institution using a mesh network model, there can be confusion as to where to seek help, especially if many of the units are hyper-specialized and the newcomer does not fall within the areas currently being served. In addition, a critical component of DH, IT support, may also follow in a mesh network model.[11]

An example of this model is the Transcriptions Lab in the English Department at the University of California, Santa Barbara, which is linked to Media Arts and Technology Program, the Center for Information and Technology, the Humanities Data Curator in the UCSB library, and the Early Modern Center, also in the English Department. Another example is UCLA's Center for Digital Humanities, which is an important node in a mesh of participants including departments and institutes in the humanities, arts, information, and social sciences, as well as experts from the UCLA Library and the research IT–focused Institute for Digital Research and Education (IDRE).
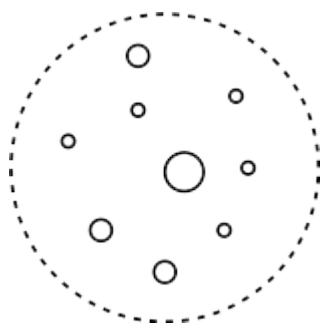
Consortial Model

Recent years have seen a rise in the consortial or multi-institutional model of cultivating DH. The model is used as a means of leveraging resources and interests across a set of institutions in order to better support DH initiatives within each institution. While there are no formal studies on the development and strategies of this particular model, these partnerships seem to arise organically as DH practitioners look outward for a community in which to share ideas, collaborate on projects, learn and teach new skills, find and give support for their efforts, and formalize these efforts through grant-funded initiatives. These models are particularly attractive to DH practitioners at institutions that lack resources and broad interest in DH.

Moreover, the diversity of institutional, academic, and professional backgrounds often makes for a stimulating collaborative space that no single institution could provide alone. Because of limited resources, those involved in consortial models may reach out to national organizations supporting advanced research computing such as XSEDE or Compute Canada, not for large-scale high-performance computing resources—although this does happen—but for the more modest resources required to support any digital research project.

Many consortia work informally to divvy up responsibilities according to individual resources, interests, and capabilities. For instance, participants from one institution might set up a website, participants from another might provide computing resources, another might provide event and meeting space, and another might lead the communication and promotional efforts. In turn, the energy, knowledge, and community generated through these networks can feed back into each individual institution by demonstrating to upper-level administrators the importance, vitality, and broader interest in digital humanities. The consortial model, of course, is not without its own set of challenges. DH efforts in a consortium, at least initially, depend entirely on the volunteer efforts of interested participants without the guarantee of success or professional reward. As these groups mature—whether through an increase in grant or institutional funding or from recognition—they will have to consider their long-term mission and means for sustaining the organization beyond the temporary contributions of volunteers or funding agencies.

In a consortial model, good communication and community building are key and are often facilitated through in-person events such as informal meet-ups, joint workshops, conferences, and talks, as well as through digital communication tools such as social media, mailing lists, and websites. Some consortia also use tools such as Commons in a Box, an open-source networking and publishing tool that supports group communication and collaboration.

There are numerous examples of this model, including NYCDH, Boston Area Digital Humanities Consortium, Texas Digital Humanities Consortium, Tri-Co DH, San Diego Digital Humanities, Five College Digital Humanities, and the Florida Digital Humanities Consortium. An emerging consortium to watch is the Digital Liberal Arts Exchange (DLAx).

Degrees of Capacity

The capacity-building framework described in this paper is divided into three stages: early, established, and high capacity. In practice, we expect that capacity building will be uneven across the aspects described below. At some institutions, it may be easier to develop human and technical infrastructure to a state of high capacity than to address governance needs at the same level. Although the depiction of a fully high-capacity institutional program is somewhat hypothetical, the following overviews of the degrees of capacity should provide some sense of how DH support may operate at each level.

Early Stage

DH support at an institution often begins with an interested individual or group looking at how digital techniques can facilitate their research or teaching. At some point, the project's needs exceed the skills and/or time constraints of the original participants, and the project leader calls upon ad hoc support from various departments and disciplines. Project leaders may ask campus libraries and user-facing IT groups for help, even in the absence of formal support structures for this kind of work. These types of grassroots efforts are an important source of energy and enthusiasm and can be the locus of innovation on an ongoing basis. However, this model has limits, which become particularly pronounced at scale.

Grassroots initiatives take a catch-as-catch-can approach to resource acquisition and maintenance. Grants and one-time research funds are often the primary source of financial support, making it difficult to reliably offer resources (e.g., access to hardware, software, and expertise) and keep them up to date on an ongoing basis. This approach can also cause unnecessary and unhelpful redundancy, as multiple groups direct research funds into fundamentally common facilities and infrastructure rather than unique project needs. For instance, an individual project may purchase just enough software licenses to cover its own needs, rather than coordinating with other groups that would also like to purchase software in order to take advantage of bulk discounts. Governance, insofar as it exists, is vested in individual project leads, who determine the goals for their own DH projects.

In the absence of institutional support, grassroots initiatives tend to be siloed. Multiple individuals or groups in different departments or divisions may work with the assumption that they are the only people doing digital humanities on

campus because they have never seen other DH work in their local context. This, in turn, limits opportunities for the kinds of interdisciplinary collaborations that can open up new research questions.

To transition out of the early phase, project leaders need to raise awareness of the benefits and opportunities for engaging with digital tools and methodologies in order to build a critical mass of practitioners who can demonstrate sufficient demand for better-coordinated support. Inviting outside speakers to campus may catalyze a community, but one-time events are insufficient to maintain the community. A series of regular workshops on relevant tools or methods, colloquia on ongoing DH projects, lunchtime group viewings of DH talks posted online, or similar "low stakes" events play an important role in maintaining a community over time.

Established Stage

As projects begin to take shape and processes begin to become established, DH champions emerge. These individuals play a key role in making the case for institutional DH support that manifests through funding, staff allocation, and curricular and project development. Faculty and students start publicly identifying themselves as participating in digital humanities, and groups, initiatives, or departments emerge that are explicitly tasked with supporting digital humanities. Collaboration on DH projects is now more established, possibly incorporating multiple disciplines and departments. Support from campus-wide organizations such as the library and IT units is now formally committed and included in departmental support plans. A few DH courses are developed and supported with available faculty resources. Although DH projects and teams are producing papers, presentations, courses, and productive collaborations, digital humanities may not be fully embraced at a department or institutional level, particularly for promotion and tenure, though some departments may seek DH teaching and/or research experience as a preferred facet of new faculty hires. There isn't necessarily a fully developed support structure or governance for supporting DH projects at an institutional level. However, as some portion of the institution commits to investing in a burgeoning DH community that has at least tacit institutional support, there is recognition that decision making and prioritization would benefit from coordination. At the established stage, there may be attempts at forming advisory committees and an effort by DH champions to have a voice at the governance tables for campus-wide decisions around infrastructure and research priorities.

High-Capacity Stage

At the level of greatest capacity, digital humanities is fully supported by the institution through sustainable funding, support, and academic and political commitment. Adequate early-stage project support is available to enable local projects to submit compelling and competitive grant applications to funding agencies. The human and technical infrastructure is in place to provide adequate maintenance for projects that are between grants or whose grant funding has run out and/or to archive those projects appropriately. Physical spaces are available to support DH work. Departments offer full curricular programs with continuing or even dedicated DH faculty allocation. The institution is aligned in its support of digital humanities from the highest level of senior administration and continues to invest in dedicated DH staff and faculty to maintain and enhance support. The institution holds DH events locally, and faculty and staff are provided with travel support to present at conferences and/or workshops, thereby engaging with the national and international DH landscape. The institution embraces an entrepreneurial spirit toward initiating DH projects and fosters strong interdisciplinary collaborations across departments and institutions. There is a formally developed support structure and governance for providing and managing DH projects at an institutional level.

Measures of Digital Humanities Capacity

This section discusses various factors that impact an institution's ability to develop DH support and provides tables describing institutions at early stage, established stage, or high capacity for each.

Funding and Institutional Investment

External funding for DH research and program development may result in expanded institutional support into this area. Funding opportunities stem not only from grants and other extramural funding but also from the possibilities that DH approaches afford to leverage interest in the "public humanities" and the community programs with which digital humanities scholars can partner. Recent programs in Canada, for example, have started to fund humanities scholars to look at the effects on society of new developments in genomics. Particularly as budgets tighten across institutions, the availability of additional funding often

makes collaboration possible at a time when organizations may be more inclined to hold tight to their own resources.

All facets of developing institutional support for digital humanities require an investment of time, and most require funding, both for initial development (e.g., creating new course curricula, creating or expanding consulting programs) and for long-term sustainability. People with different institutional roles can contribute in different ways, and the level of interest from each of these groups may shape the program development.

- **Individual** faculty, support staff, and other practitioners need to commit their personal resources of time and energy through:
  - Attending workshops and conferences
  - Self-study to acquire new skills
  - Peer-to-peer communication and social learning among practitioners
  - Participation in crowd-sourced projects
  - Applying for grants
  - (Re)designing courses for a DH orientation or focus

- **Departments and academic programs** invest by:
  - Making DH work an important component of faculty recruiting and recognition
  - Offering post-doc positions and fellowships for DH experts and ways for them to contribute to, and be incorporated into, the larger campus community
  - Creating certificate programs or concentrations that focus on DH methods
  - Offering course release time for DH work

- **Institutional** investment can come in the form of targeted funding from central groups, including the office of the president or provost, deans, libraries, and IT groups. Central funding is often used to support:
  - Dedicated space and equipment
  - Positions for programmers and other technical staff targeted to DH support
  - IT infrastructure, including resources for both active projects and data archives

- ➢ Hosted services such as Omeka or WordPress

- ➢ Software site licenses

- ➢ Funding for consortial memberships

- ➢ Workshops and training

- ➢ Internal grants of money or in-kind services

- ➢ External grant applications, including data-management plans

- ➢ Promotion and tenure guidelines that value digital work

- **Consortial, regional, or national** investment can include cross-institutional resources such as:

  - ➢ Shared high-performance computing clusters

  - ➢ High-speed networks

  - ➢ Federated authentication systems

  - ➢ Communities of practice and collaboration

With substantial investment in DH resources come important decisions about the business rules that govern access to shared resources. In most cases that means deciding what resources should be offered "for free" and which should have direct charges. The appropriate balance of fee vs. free resources can depend in large part on how other institutional services are budgeted and delivered. Some institutions use chargeback as the norm for many resources, and some units such as the library often avoid making direct charges for services as much as possible.

The pros and cons of fee-for-service models are familiar. Service providers must be efficient and market-driven; if the in-house service doesn't deliver value, users will move to outside providers. Users must be responsible in their consuming habits; projects must have "owners" capable of covering costs for the life of a project. But fee-based models can inhibit experimentation, even at a small scale. Costs for technology projects can be hard to predict (especially for application development); grants and budgets often prove inadequate, and projects can stall before delivering the desired results. One-time money can be used to build a project but provides no support for ongoing hosting or maintenance.

Grants and gifts can provide a significant component for investment in DH development, though the vast majority of grant programs focus on specific projects rather than on building overall institutional capacity. The number of external grants and institutional funds available for DH projects pales in

comparison to resources currently offered for other types of research.[12] This is an aspect of DH funding that senior administrators might not understand, and it is important that they realize that limited grant funds may necessitate increased institutional investment if digital humanities is to succeed at scale. Funding for digital humanities in North America comes primarily from public-sector grants, foundations, or private gifts.

A few commonsense principles can be applied, regardless of the business model that is chosen. These include:

- Recognize that many projects will have downstream costs. Be clear about the resources required through the stages of planning, prototype development, updates, hosting, maintaining, archiving, etc. Make sure there is a plan that covers the entire project life cycle, including criteria for sunsetting projects for which there is no viable maintenance plan.

- Manage expectations and consuming behavior responsibly. If direct fees aren't involved, then determine what mechanisms can control scope creep, poor planning, or other inefficient use of resources.

- Look for ways to reduce barriers to experimentation. How can you encourage good ideas to be explored and tested easily? Keep the costs and procedural overhead to a minimum for projects in early stages of development; scale up requirements for planning and budgeting before moving to more advanced levels of development.

- Be clear about the business rules and apply them consistently. A good DH program must be seen as an accessible resource, not biased toward underwriting the interests of a small well-connected group.

Table 1. Funding and institutional investment capacity

	Early Stage	Established	High Capacity
Funding Sources	Researchers largely receive funding for DH activities as part of grants headed by other institutions, although a small number of local researchers may receive ad hoc funding for projects (from grants or similar) or may conduct DH projects without external funding.	A small internal grant program may support some digital scholarship or use of DH within some courses. Expertise exists in research services offices to support researchers in applying for DH project funding.	Dedicated, ongoing institutional funding exists specifically for DH projects. Clear paths exist for collaborations with other disciplines in order to access funding outside traditional humanities funding (NEH, SSHRC). Major grants for digital humanities are held by faculty at the institution.
Staff Support	Institutional technology and library services have little to no experience with DH projects. No financial resources exist for student, staff, or faculty training on DH tools or methods.	There are identifiable IT and library staff who have some DH expertise but have not been hired for a DH-specific role. The institution financially supports sending students, staff, and faculty to DH training but does not offer it in-house.	The institution funds technical staff specifically for DH researchers. The institution financially supports sending students, staff, and faculty for DH training and offers in-house DH training.
Institutional Support	No formal financial institutional support exists.	Institutional resources—such as site licenses for software, labs, and services—can be accessed for DH projects but are not aimed at DH.	The institution funds space, labs, and/or equipment for DH researchers and may also offer local project grants for researchers.

Governance

Governance provides structure for organizational decision making, clarifying who has the authority to make different kinds of decisions and who is consulted in the process. The scope and nature of governance can vary significantly based on institutional culture, and there is no single "correct" model. Nonetheless, a shift toward more centralized and documented decision-making processes characterizes the development of DH capacity.

When DH activities on a campus are limited to the grassroots level, little or no formal governance may be needed. A project PI typically has final decision-making authority within the scope of his or her project. Similarly, an individual librarian may only need tacit approval from a supervisor to participate in a project team when similar requests from scholars are rare. As support for DH activities becomes institutionalized in some form, establishing some kind of governance model can reduce duplication of services and ensure that resources are allocated

in alignment with the strategic priorities of the program. This can also contribute to sustaining institutional investment in DH support.

From the scholar's side, acquiring support for a project in an institutional context without a governance model is a matter of having the right personal connections. It is challenging to sustain a project when support is provided through these informal networks because changing circumstances can necessitate reallocating resources with little warning. From the institution's side, once a support program is in place, it is important to ensure that resources are allocated in a manner that aligns with the vision for the program. For instance, if a centrally supported digital humanities initiative is established with a primary goal of improving job placement for humanities undergraduates in media and communications career tracks, the institution should put a process in place to prioritize requests for funding or staff collaboration that involve relevant courses rather than unrelated research projects that have no connection to undergraduates. The governance mechanisms that an institution develops will not—and should not—apply to all DH activities at the institution. Innovation, spontaneity, and collaboration built on a personal connection have an important role to play in the development of a campus DH program, but at an institution with high capacity these will not be a substitute for some sort of governance model.

Governance at UC Berkeley

Governance has long been an important facet of UC Berkeley's efforts to support DH research. In 2007, leaders in arts and humanities, computer science, the library, and central IT formed the Humanities and Arts Research Technologies (HART) initiative to better coordinate efforts to support arts and humanities research using technology. The steering committee for that initiative served as the earliest governance body for digital humanities support. As part of the initiative, feedback from a focus group helped shape the direction of Project Bamboo, a humanities cyberinfrastructure initiative funded by the Mellon Foundation in 2008. In 2013, a DH council was formed consisting of key faculty members with an interest in digital humanities, as well as library, research IT, and education technology leadership. This group was responsible for evaluating the data collected through the needs-analysis process, and subgroups of the council drafted the major sections of a proposal to the Mellon Foundation for developing a campus support program for digital humanities. Final decision-making authority on major strategic goals rests with the dean of arts and humanities, but the council is recognized as an important advisory body.

The details of the governance model will vary considerably based on institution type, culture, and goals for the digital humanities program. There may also be multiple governance bodies—for instance, one to oversee the allocation of seed grant funding and another to work toward aligning local tenure and promotion practices with guidelines issued by disciplinary organizations around the assessment of digital projects. Where appropriate, these governance organizations should be aligned or at least in communication with one another. At the established stage, governance may not

yet include the involvement of senior administrative personnel, such as deans, vice chancellors for research, etc., but support from these and similar groups can strengthen a DH program.

The institutional DH organizational model has some impact on the makeup of governance bodies. If DH support is concentrated in a clearly defined group with its own internal structure and hierarchies (the centralized service model), it may be possible for that group to lead the governance bodies and enjoy relative freedom in selecting additional members from among interested parties elsewhere on campus. For an institution using the consortial model, leadership within the institution has a great deal of freedom in how to create and organize governance bodies with strictly local scope (e.g., relating to internal grants or promotion and tenure) because they do not directly affect other consortial partners. Governance of shared consortial programs or resources, however, requires buy-in from all participating members.

At institutions using a networked or hub-and-spoke model, institutional DH support takes the form of partnerships across organizational boundaries (e.g., drawing from the library, educational technology groups, and research IT groups), and ensuring that partner organizations have a seat at the table as part of governance bodies is an important way to support and strengthen those partnerships. In cases where the leadership of the DH program perceives a need to exclude a partner organization (e.g., for a potential conflict of interest on a funding committee), this should be identified and discussed with the partner in advance. Similarly, decisions on the membership of certain specialized governance bodies (e.g., technology governance, to make decisions about what software to promote for particular use cases, when site licenses are appropriate, and who should fund site licenses) are best reached through a discussion with partner organizations and other key stakeholders, and by mutual agreement they may not include representatives from all partners.

Table 2. Governance capacity

	Early Stage	Established	High Capacity
Governance Process	The decision-making process is ad hoc, inconsistent, and/or poorly documented. Decisions are made at the local level (e.g., by individual scholars or within a particular unit) based on typically incomplete data. The ad hoc nature of decisions means that successes are not necessarily repeatable.	A formal governance process exists but may not be well documented or widely known.	Governance is defined in a formal, documented, and clearly understood framework for decision making, addressing all components of funding, resource allocation, policy, and architecture. While there may be different governance bodies for different areas of the program or for different levels of resources (e.g., some project- or department-specific resources may be managed at a local level), the institution has appropriate buy-in from and involvement by senior academic staff, such as deans, VPs for research, etc., as well as library and IT leadership.
DH Awareness	There is a fundamental lack of transparency around how and why DH work happens.	Governance bodies are at least broadly familiar with the DH landscape at the institution, including key faculty members and major groups and organizations.	Governance bodies are aware of the local landscape as well as trends in the national and perhaps international landscape of digital humanities, and they may be in conversation with similar representatives from other institutions through working groups, mailing lists, and/or informal connections. These bodies will also be well coordinated and/or integrated with existing governance around research and IT priorities and funding.

Infrastructure

Infrastructure enables the smooth development of DH work. At many institutions, researchers currently spend a lot of time identifying and locating a range of resources necessary for their work. An institution that provides a robust infrastructure will seamlessly support DH scholarship and also the integration of DH resources and projects into teaching and learning. Infrastructure includes many components and supports the life cycle of DH work from inception through curation. Many units and specialists on campus and external partners may provide the technical infrastructure for DH work, as well as the human infrastructure that is equally important.

To work in digital humanities requires access to fundamentally the same IT infrastructure—the network, hardware, software, and the people who can run them—that has been an accepted foundation for science, engineering, and even business for decades. Indeed, it is the infrastructure needs of DH practice that have brought digital humanists "out of the stacks" and into partnership and negotiation with IT and its more traditional users as a foundational aspect of DH work. The technology ecosystem that underpins digital humanities work is often the same ecosystem that underpins the work of our colleagues in life, physical, and social sciences, with the necessary customizations to address the unique approaches and the different types of data for our disciplines. The challenge is getting a voice at the table alongside the more traditionally "technical" or "digital" fields to argue for humanistic needs in the continuing campus dialogue around investment priorities in academic technology. In some cases, researchers in DH find the technical support for their work through a combination of experts in IT and in the library.

Sources used in traditional humanities—whether text, data, visual materials, or other sources—become the heart of DH work. Infrastructure for digital humanities includes attention to availability of digitization services, advice on metadata creation, consultation on intellectual property issues, and advice and provision of services for access to the products of DH work. Long-term curation of the products of DH is also a challenge; ideally decisions are made early in the project life cycle as to whether the ultimate product needs long-term curation, whether it is feasible, and who will take responsibility for curation. Libraries are generally the logical unit to provide curation services, but many are not yet able to provide long-term solutions for projects that use specialized or homegrown software, include interactive components, or have no fixed, final state.

Currently, most faculty in colleges and universities have access to high-performance computing networks and at least basic hardware and software. However, institutional licenses for specialized software, high-end computers needed for some types of analysis and display, and strategies for storage (both short and long term) for projects involving specialized software and a range of content types may not be available for researchers unless they source and pay for these things on their own. It is important to help senior administrators, who control allocation of resources, to recognize that DH projects are part of the institutional research technology ecosystem, which has traditionally been tailored to meet the needs of scientists.

Setting aside the challenges of investment priority, it is accepted that quality DH work necessitates access to a complex infrastructure stack, including networking, systems, data storage and management, curation, compute infrastructure, a multiplicity of hardware and software devices and tools, publication and display systems, and the tools and modalities for sharing with and connecting to the many people involved in a given body of work. Even in small institutions, scholars may have access to national computing resources, such as Compute Canada or XSEDE, for high-performance computing (HPC). They may lack awareness of those resources, however, and training on their use may not be offered at the institution. Ultimately, the infrastructure in a mature environment can scale incrementally, rather than having to continually pull enough shared interest and resources together to make the case for investments in network or server hardware and cobble together the expertise to administer it.

Digital humanities also requires physical spaces for collaboration, experimentation, display, teaching, and training. On some campuses, these spaces are housed in departments where digital humanities has ongoing grant funds or strong support from a department chair, dean, or provost. There is a growing movement to provide physical spaces in libraries for DH work or, more broadly, digital scholarship in many disciplines.[13] These dedicated physical DH spaces or centers have DH hardware and software, provide a varied training program, and have dedicated staffing ready to onboard new projects and practitioners. They offer meeting rooms, workstations with preinstalled software and ready connections to data storage, repositories, and data management and curation tools.

Physical Facilities May Include:

- Meeting rooms
- Hardware with dual screens, large screens, and other capabilities
- High-end software and tools
- Classrooms
- Consultation areas
- Display (3D and large-scale displays)
- Space to experiment with virtual reality
- Remote meeting setups
- Scanning labs (2D/3D/map)
- Printing labs (standard, large format/poster, 3D)
- Video and audio studios

While it remains possible to do digital humanities at some level on a single desktop, the reality is that there is a minimum viable institutional infrastructure for digital humanities to move beyond the initial exploration of a single practitioner. This minimum entails not just key elements of IT and libraries but also the knowledge infrastructure—the human component of the DH ecosystem that encompasses knowledge transfer; training for faculty, students, and staff; and the governance structures discussed above. And, because there is a minimum

viable infrastructure that includes both technology and human expertise, the digital humanist often has to tap into community and shared resources, whether departmental, organizational, regional, or national. Beyond the initial exploration, to sustain digital humanities in the long run it becomes important to connect in with funding infrastructure, including access to grant support, and graduate-student funding, as well as become involved in the negotiations around funding priorities for these necessarily shared resources that make up the technology ecosystem.

An important component of a DH program is provision of an online portal that informs and connects providers and practitioners with available resources/services—including policies and best practices around hosting, storage, network use, and how to plan for infrastructure needs through the full project life cycle. Easing the burden of the researcher involves good communication about how to access DH resources both within and outside the institution.

The range of technologies and infrastructure used within the digital humanities is vast, and its varying degrees of availability—and sustainability—reflect the capacity of an institution to support DH work. The types of tools and human expertise needed to support DH can be broken down into a number of different categories, but here we have identified two primary infrastructures in a DH ecosystem: technology infrastructure and physical space. Another essential component—the people, both the scholars themselves and the experts who work with them—is described in the next section.

Table 3. Infrastructure capacity

	Early Stage	**Established**	**High Capacity**
Technology	Researchers work on standard desktops, with access to institutional high-speed networks, some cloud or local file storage, and only basic tools and with no support for research applications or for onboarding. They typically need to purchase their own tools and devices for scanning, modeling, network/text/statistical analysis, geographical information systems (GIS), image processing, data visualization, etc.	DH practitioners know about available technology resources provided by a department or central unit such as IT or the library, including high-end desktops, specialized software, and tools. Staff are available to work with researchers, but DH services are not usually ready and waiting, nor are the pieces thoughtfully integrated for purposes of DH work.	Infrastructure is developed with the needs of DH as an important disciplinary "node" in the institution's research production and teaching and learning program and offers a full range of technologies.
Expertise and Training	DH practitioners have limited access to the specialized support to use tools effectively. There is no ongoing training program for faculty, students, or staff.	Expertise and support are available on campus for specialized software, digitization services, and HPC resources targeted to areas of particular demand at the institution. Workshop programs covering a limited number of topics are offered for faculty, students, and staff.	There is dedicated staffing ready to onboard new projects, practitioners, support hardware, and software relevant for DH projects. A wide range of training opportunities is offered on a regular basis for faculty, students, and staff.
Physical Spaces	There are no physical spaces dedicated to DH for research or for teaching and learning.	Faculty have access to some physical space—such as a dedicated GIS lab—for using specialized software and those facilities and resources can be used by students as well.	The institution has a dedicated physical DH space or center that has DH hardware, high-end desktops, meeting rooms, and display capabilities (such as video walls and 3D displays) available for research, teaching, and learning.
Data Management	There is no guidance on data management or planning.	Data management and planning services are available on an ad hoc basis.	Data management and preservation practices and systems are operational with clear policies in place. Experts help with curation and preservation of digital projects and data, including sharing these when possible through the Open Science frameworks. Established processes and policies determine when to sunset projects and how best to do so, while in some cases preserving future access to the data underlying the research.

Roles and Capabilities

In order for DH efforts to be successful, talented scholars and practitioners are needed who can communicate and operate across multiple units and disciplines and across multiple functions and levels of the university. The roles and capabilities required for DH support vary by the stage and size of the DH effort. Organizers of each effort should evaluate what is necessary for their short-term success, keeping an eye on long-term sustainable support solutions and developing toward those solutions.

The successful DH team is, first and foremost, collaborative. It comprises unique individuals with individual strengths coming to the table with varying levels of experience and skills. Some players bring the content knowledge and some the technical know-how or design skills. Others may be expert teachers and mentors, while still others may bring project management skills. Some are brand new to DH work but bring enthusiasm and a spirit of experimentation and discovery that infuses projects with innovative energy. Within this *learning community of practice*, what's important are the knowledge, skills, and perspectives each individual brings to the table, as well as what each member can contribute to the project at hand. The roles and capabilities of DH team members belong to three complementary categories: **technical experts**, **champions of engagement**, and **content innovators**. Within these broad categories, there is great deal of overlap and interdependence through which DH can flourish.

Technical Experts

Technical experts are critical to the success of the DH program, allowing all individuals involved—scholars, teachers, librarians, technologists, practitioners, and scholars in training—the ability to take on new types of projects and further existing ones. Increasingly, DH programs and centers are recruiting professional staff who possess the specialized technical skills needed to support dynamic new forms of scholarship. Agile, curious, and creative technologists who bring unique skills to the table and who embrace learning new skills and tools on the job are essential. The technologies, applications, and methods associated with DH are typically not unique to one discipline; in cases where they are, they are generally translatable across disciplines. Skills in web and software development, web and project hosting, and custom application configuration are all currently in high demand.

Experienced IT professionals from multiple areas of the university are critical to the long-term vitality and sustainability of DH projects as well. These include personnel in specialized areas such as systems administration, security, storage, backup, and maintenance who are available for consultations, advice, and support as needed. These functions may already be well covered in the existing IT structure, whether it be centralized within the university or decentralized within a college, school, or other unit. It is important to establish good lines of communication with campus and/or departmental IT and even establish memoranda of understanding (MOUs) for mission-critical aspects of the DH program. Librarians are another key source of technical expertise. Some university libraries now have a dedicated DH or digital scholarship librarian or other dedicated personnel in this area. The library may also have an established relationship with the DH program or center, which may be located in the library, providing a neutral, inclusive environment for multiple disciplines.[14] Library personnel may also have specialized expertise in digital asset management, data management, metadata, cataloging, and curation and can provide expertise in developing preservation plans for the long-term care and feeding of digital projects. Instructional technologists and designers are valuable team members for integrating DH into the curriculum and advising on the construction of course assignments that result in digital projects.

Informal Communities of Practice

An exemplary model for developing an informal community of practice around DH is The Programming Historian, providing "novice-friendly, peer-reviewed tutorials" to help humanists learn new tools to enhance their research. Each lesson is designed to be short and accessible, and may be completed individually or as a group.

Champions of Engagement

Working alongside IT professionals and librarians are the campus "champions of engagement" who can develop the relationships across departments, disciplines, pedagogies, and professional lines that can open the way for more collaboration and innovation. These engagement leaders seek to connect individuals from diverse backgrounds through hosted meetings and events, such as speakers' series, brownbag discussions, and unconferences, such as THATCamp. Informal meet-ups and events can bring together a mix of scholars, technologists, librarians, and students and generate stimulating discussions enabling everyone to share their particular expertise or unique perspective. Ideally, participants form collaborative partnerships that can take scholarship in new directions. As discussed, an established DH program may have a physical center that serves as a hub to host

discussions, presentations, and events related to digital scholarship. The center may also be home to a core mix of technical experts, champions, and fellow scholars who can consult on any number of digital tools, provide guidance on different aspects of a project, or connect scholars who may not be aware of each other's work.

In order to promote digital humanities to a wider audience, campus DH champions may reach out to fellow scholars and instructors who are less technically inclined or who come from non-humanities disciplines. Inviting local or visiting digital humanists to discuss their work may help remove some of the mystique and perhaps skepticism around DH work and help broaden the discussion. In addition, providing hands-on workshops or short tutorials or forming user groups can encourage others to explore new approaches to their research. Other institutions have developed formal programs for faculty and students, providing incentives for investing time toward the learning of new research methods or digital tools. This approach embraces experimentation, risk, and even failure and uncertainty. To engage students, a number of institutions offer certification in digital humanities, allowing students to add a specialization—such as text analysis, GIS, or data visualization—as complements to their major.

Engagement with the curriculum may include established courses with a DH or digital scholarship designation within a department, special topics or cross-listed courses, or segments of existing courses where guest instructors are brought in for a portion of the course. With respect to engaging students in DH projects, focusing on learning outcomes may address the practical and hands-on aspects of DH work—acquiring new skills and learning by doing—as well as the theoretical concepts and changing nature of scholarship within a particular discipline.

Content Innovators

As we discuss these various roles and capabilities, it is important that we also recognize the scholarship itself and the content innovators who seek to promote new knowledge utilizing dynamic methods. In order for digital humanities to thrive in long run, there must be a commitment from the institution to hire, retain, and promote innovative individuals who are capable of original contributions and of taking scholarship in new directions. These are trained scholars possessing the digital skills and enthusiasm to share knowledge beyond the monograph, presentation, or paper. Content innovators embrace interdisciplinarity, collaboration, and partners from various areas of the

university, including other faculty, staff, graduate students, and even undergrads. Digital humanities may be seen as a move from the scholarship of "mine" to the scholarship of "ours." The content innovator is open to group authorship and is sometimes willing to take the back seat so that others can drive the project and share in the recognition.

This role also suggests a move beyond the local campus community to creating new connections with content and scholars at other institutions. Content innovators are open to new audiences and partnerships. This external focus applies to grant-writing skills as well. Academic administrators often expect that external funding will be identified to keep DH programs solvent, to continue existing projects and launch new ones, and to fund graduate assistants and personnel lines. Content innovators are effective writers and communicators beyond the discourse of their discipline and are able to make the case for DH to administrators and all stakeholders. Ultimately, a clear vision is required for DH programs and projects to be successful. The content innovator as project leader has a vision for what a project can be and for the broader implications for evolving scholarship. This vision is clearly communicated with all team members and contributors, and the project leader acknowledges and promotes the team's work and values the contributions of all its members at all levels. Most successful are those individuals who can serve as both practitioner and theorist. When needed, they are capable of getting hands-on or "in the weeds" on a project. This understanding of the small details as well as the big picture allows for effective communication at all levels.

Table 4. Roles and capabilities capacity

	Early Stage	**Established**	**High Capacity**
Communication	DH projects are mostly ad hoc and at a grassroots level. No IT or library personnel are dedicated to DH projects, but interested partners begin to emerge.	Key players begin to be identified, namely technical experts and curricular and pedagogical champions. Additionally, there is commitment from IT and library for storage and preservation.	A formal DH or digital scholarship center/program is established, with dedicated faculty and staff for software development, hosting, and long-term preservation of projects. The DH program is a model for IT-library-faculty (intercampus) collaboration.
Outreach	There is informal curricular infusion of DH concepts, but it is often isolated and without coordination. A few instructors begin to incorporate DH methods and hands-on projects into their courses.	Courses appear with DH or digital scholarship in their titles/descriptions.	There is broad curricular buy-in across multiple disciplines; formal credentialing, certificate, or degree programs are offered.
Education and Training	Individuals begin to form support groups and share ideas around DH. However, formal lines of communication are lacking, as is campus awareness of DH events and meetings.	Formal user groups meet to share knowledge and experience; workshops and professional opportunities are promoted through formal communication channels. Additionally, collaborative partnerships are formed between departments and campus units to support DH.	Collaborative partnerships offer student assistantships and fellowships, and original contributions are produced with high grant-award capacity.
Recognition	A few faculty emerge as potential content innovators, but there is no formal recognition of their efforts; digital humanities may not be considered in promotion and tenure decisions.	There is support for generating new forms of DH scholarship, and digital humanities is considered in promotion and tenure decisions.	The institution recruits top DH scholars and formally recognizes DH scholarship in its promotion and tenure decisions.

Communications and Outreach

DH scholars may find it challenging to navigate collaborations across disciplinary lines. Communications and outreach are key to building and sustaining a thriving DH community on any campus. While outreach efforts should be tailored to the interests and resources of the campus culture, nearly any DH initiative can benefit from considering a common set of strategies, such as establishing a central and comprehensive source for campus DH communications so that experienced practitioners and curious newcomers alike can easily find relevant information. A

central communication source can leverage a variety of methods to draw interest and energy around DH initiatives including campus-wide announcements, targeted e-mails, blogs, discussion lists, social media, and digital signage. To supplement these efforts, facilitators should support the communication efforts of other DH campus practitioners and find ways to encourage peer-to-peer coordination, such as by setting up a digital commons platform like Commons in a Box.

In addition to news and events, outreach should highlight projects and publications to raise awareness of the kinds of DH being done and to model possibilities for newcomers. Outreach should also disseminate information about grant opportunities or professional development, such as THATCamp, summer institutes like DHSI and HILT, conferences such as DH and HASTAC, and workshops including NEH Institutes for Advanced Topics in the Digital Humanities. Throughout these efforts, outreach should strive to strike a balance between accessibility to newcomers and relevancy for experienced practitioners, while avoiding preaching about DH as a solution or improvement to all pedagogy and research.

Many DH organizations and groups may also need more focused lines of communication for managing and producing collaborative projects or carrying out day-to-day operations. Project management tools such as Basecamp, Trello, and Asana allow groups to manage complex collaborations through scheduling, notification, messaging, file sharing, and to-do list features. Slack, a streamlined real-time messaging tool, has also become a popular option for hosting conversation devoted to DH community or initiatives. Equally important are tools that allow for the production of collaborative documents, such as Google Docs, Box, or Etherpad. Most of these tools are either free or have free versions, though subscriptions often significantly expand their capabilities.

Table 5. Communications and outreach capacity

	Early Stage	Established	High Capacity
Communication Channels	There is no coordinated way for DH practitioners to learn about events, resources, possible collaborators, or other activities on campus. Researchers might be tied into external regional, national, or international networks, but access to these networks is not integrated into their campus life.	More centralized systems of communication and outreach exist, such as interfaculty groups, mailing lists, or regular events.	Communication and outreach activities are highly coordinated with recognized leaders across campus who drive initiatives.
Outreach Activities	No formal outreach efforts exist, though informal outreach may take place via, for example, internal, department-level discussion groups. Regular communication may be limited to that between individual scholars.	Some support for formal outreach exists (e.g., funds for one-off events or activities that revolve around DH work), but this funding would not be regular or part of operational funds.	Activities involving community outreach and communication are funded through a dedicated channel or organization.
Education Activities	Education for early adopters isn't available; these researchers must rely on their own technical capabilities and knowledge of the field.	Education activities might include basic skills training to ease onboarding for new practitioners and some coordinated efforts to centralize information about how to access infrastructure and knowledge networks.	Training and skill development for DH students and practitioners on campus are centralized and available at multiple skill levels, from beginner to advanced.

DH Acceptance and Support

Ensuring that digital humanities work is appropriately acknowledged, evaluated, and factored into formal assessment processes may seem like an intractable problem, particularly in the early stages of DH program development. While it may not be possible to fundamentally transform promotion and tenure or course evaluation guidelines, particularly in the absence of developments at a disciplinary level, it is important that staff and librarians involved in institutional support for digital humanities acknowledge the risks that instructors and researchers face in pursuing DH work.

Traditional evaluation of humanities scholarship for promotion and tenure assumes that the scholar accomplished research independently, as a solo

practitioner. Consequently, the implications of the collaborative model that underpins most DH projects can be as difficult to grapple with as the digital aspect of these projects. While many scholars give conference talks on their projects while they are still being developed, a project may take many years of work before it can produce a paper in a peer-reviewed journal. The need to undergo a traditional promotion and tenure process can serve as a deterrent for junior faculty to dedicate much time toward DH work. Even junior faculty who were hired for positions that explicitly mention digital humanities may feel this pressure in the absence of clear signals from their home department about how that work will be evaluated. Junior faculty who undertake DH work may do so in addition to producing the traditional scholarly outputs (in the form of articles and a monograph) that will more reliably support their case for tenure.

Realistically, an individual institution's DH support program will have limited impact on the evolution of local tenure and promotion guidelines. Major changes are more likely to take place at a disciplinary level, and in fact, a number of disciplines have issued and updated evaluation guidelines for digital scholarship. Key examples include the Modern Language Association,[15] the American Historical Association,[16] the College Art Association, and the Society of Architectural Historians.[17] Local digital humanities support staff and librarians should be informed about existing guidelines and recommendations for evaluating digital scholarship and be able to provide references when asked about evaluation. Department chairs, deans, and/or provosts who are actively engaged in the DH program can be powerful allies in advocating for the local implementation of guidelines that have been developed for a particular discipline (or related disciplines).

Table 6. DH acceptance and support capacity

	Early Stage	Established	High Capacity
Support	Supporting DH projects is done "on the margins": individual librarians or IT staff may be able to carve out a small amount of their own time to provide ad hoc support to a small handful of projects, with little more than the informal approval of their supervisor. DH support is not formally listed among library and IT services or programs. Toward the latter part of this stage, supporting DH projects may become an acknowledged part of a staff member or librarian's work, and measures may be put in place to limit these projects' impact on official job responsibilities. There may also be an effort to develop a process to allocate resources across multiple projects.	One or more staff support DH projects in a way that is recognized as being part of their job rather than something done "on the margins" (requiring buy-in from at least the managerial level in IT and the library). One or more individual campus groups may offer DH consulting as a service, but there is little or no coordination across groups, though communication may be robust at lower levels in the organizational structure, as individual librarians, IT staff, and departmental staff attend the same DH events (guest lectures, working groups, workshops, etc.).	Buy-in for DH support exists at the leadership level. Open lines of communication exist across groups to enable coordination of DH consulting support. Formal discussions from IT, libraries, and departments advocate for the coordinated digital humanities support program.
Acceptance	DH work is not accepted as core part of the promotion and tenure dossier and is not integrated into coursework.	Some department chairs and deans are aware and supportive of disciplinary guidelines for assessing DH work for promotion and tenure. Individual faculty may begin to include DH content in their courses.	Department chairs, deans, and provosts have formal policies supporting the assessment of DH work for promotion and tenure, and disciplinary guidelines are widely and consistently followed. Integration of DH into courses is common.

Conclusion

Developing institutional strategies for the support of digital humanities will accelerate the initiation and growth of DH programs within and among universities and colleges. The intent of this paper is to assist institutions in building robust programs that are sustainable and that add value to both the practitioners of digital humanities and the institutions within which they work as faculty, students, and staff. There is no single plan for accomplishing this; supporting digital humanities involves developing many aspects of a program such as technology infrastructure, policy, disciplinary recognition of the work, and, importantly, a team of individuals from various sectors of the university who contribute a variety of skills and other resources to research projects, ongoing programs, and teaching and learning initiatives.

This paper is intended to be a starting point for development or growth of an existing DH program. Digital humanities support is expanding in institutions across the world, and many DH groups embrace an ethos of openness and collaboration. This itself provides an opportunity, insofar as it facilitates reaching out to existing programs for advice on best practices. Many programs and summer institutes allow scholars, librarians, or staff who are new to digital humanities—or who have some experience but are interested in extending that expertise—to quickly develop a network of peers while simultaneously learning hands-on skills; such programs also allow ongoing networking among more advanced practitioners and the mechanisms for them to share their specialties with colleagues (see Appendix B for a list of DH resources). Numerous mailing lists focused on different kinds of DH support provide other avenues for soliciting feedback and suggestions on program development. Another important thread of the culture of many DH programs is reflexivity: focusing not just on the work itself but on how the work gets done, making conscious steps toward improving access and participation for underrepresented groups, and being mindful of labor conditions for project staff, particularly students. In this way, digital humanities often includes practices that other disciplines could benefit from emulating.

It is possible that in a decade or less, the term *digital humanities* will be obsolete and that the methodologies, tools, and technologies discussed in this paper will be fully integrated into humanities disciplines and the culture of academic institutions. In the meantime, IT professionals and librarians can work in partnership with faculty and students to develop innovate programs and projects, engage an increasing number of people in this work, and develop the mechanisms of support that will be critical for DH success in the long term.

Acknowledgments

Authors

Special thanks go to the following ECAR/CNI Digital Humanities (ECAR-DH) Working Group authors of this report:

Kirk M. Anne
Assistant Director, Systems &
    Networking
SUNY College at Geneseo

Tara Carlisle
Digital Scholarship Specialist
University of Oklahoma

Quinn Dombrowski (Co-Chair, ECAR-DH)
Digital Humanities Coordinator,
    Research IT
University of California, Berkeley

Erin Glass
Digital Humanities Coordinator, UC San
    Diego Library, and Associate Director
    of the Center for the Humanities
UC San Diego

Tassie Gniady
Digital Humanities
    Cyberinfrastructure Manager
UITS Research Technologies
Indiana University

Jason B. Jones
Director of Educational Technology
Trinity College

Joan K. Lippincott (Co-Chair, ECAR-DH)
Associate Executive Director
Coalition for Networked Information

John MacDermott
Director for Instructional Technology,
    SAS Computing
University of Pennsylvania

Megan Meredith-Lobay
Digital Humanities and Social Sciences
    Scientific Analyst
The University of British Columbia

Barbara Rockenbach
Interim, Associate University Librarian
    for Collections and Services
Columbia University

Annelie Rugg
Humanities CIO
UCLA

Ashley R. Sanders
Director of the Digital Research Studio
Claremont University Consortium

John Simpson
Humanities and Social Sciences
    Specialist
Compute Canada; University of Alberta

Bryan Sinclair
Associate Dean, University Library
Georgia State University

Justin Sipher
Vice President, Libraries & IT
St. Lawrence University

This working group project was facilitated by Karen A. Wetzel, Senior Manager, ECAR Working Groups.

Notes

1. The review process for DH projects should consider what a project requires and how the project furthers DH goals and the mission of the individual, department, or institution. Diane M. Zorich lists specific criteria used for evaluating projects in *A Survey of Digital Humanities Centers in the United States* (Washington, D.C.: Council on Library and Information Resources, 2008).

2. The EDUCAUSE Technology Research in the Academic Community (ETRAC) conducts annual student and biennial faculty surveys that provide insight into what students and faculty need and hope for from technology.

3. Rick Szostak, "Extensional Definition of Interdisciplinarity," *Issues in Interdisciplinary Studies* 33 (2015): 94–117.

4. See, for example, the Digging Into Data grant program, which partners NEH, IMLS, and NSF in the United States, as well as a range of other participating countries including Canada, the United Kingdom, the Netherlands, and Finland. This grant program "aims to address how 'big data' changes the research landscape for the humanities and social sciences."

5. See, for example, the 2016 Los Angeles Review of Books series, "The Digital in the Humanities: A Special Interview Series," which spawned many conversations about the roles, responsibilities, and functions of digital humanities.

6. Nancy Maron and Sarah Pickle, "Sustaining the Digital Humanities: Host Institution Support Beyond the Start-up Phase," Ithaka S+R, June 18, 2014.

7. Joan K. Lippincott and Diane Goldenberg-Hart, "Digital Scholarship Centers: Trends & Good Practice," CNI workshop report, 2014.

8. Nancy Maron, "The Digital Humanities Are Alive and Well and Blooming: Now What?" *EDUCAUSE Review* 50, no. 5 (September/October 2015).

9. See Matthew G. Kirschenbaum, "What Is Digital Humanities and What's It Doing in English Departments?" ADE Bulletin, no. 150 (2010), for a good discussion of how DH became somewhat siloed.

10. Nancy Maron defines this as a "network model" in "The Digital Humanities Are Alive and Well" and references a "hub and spoke" approach, as well. In this article, she groups into the network model both the "hub and spoke" and "mesh network" approaches that we separate out here as distinct.

11. The University of Wisconsin–Madison, for example, highlights this issue in the challenges section of its white paper on enhancing DH at the institution: "Confounding and underlying these challenges, the arts and humanities have lacked a well-funded, high-level IT group and, more importantly, an ethos of utilizing technologies analogous to those found in many science and professional programs." See Jon McKenzie et al., "Enhancing Digital Humanities at UW-Madison: A White Paper," 2009.

12. Major funding agencies for DH work have included the National Endowment for the Humanities Office of Digital Humanities, National Historical Publications and Records Division (NHPRC), the Institute of Museum and Library Services (IMLS), and the Andrew W. Mellon Foundation. Of these, the Mellon Foundation has been the most open to supporting program development in addition to project development, though their funding priorities are continually evolving.

13. For more, see the following:

    -   Coalition for Networked Information, "Digital Scholarship Centers: Trends and Good Practice," 2014 Report of a Workshop and Participant Profiles.

    -   Diane Goldenberg-Hart, "Report of a CNI-ARL Workshop: Planning a Digital Scholarship Center 2016."

    -   Association of Research Libraries, "Digital Scholarship Support Profiles," 2016–17 profiles of member libraries.

14. For more, see Joan K. Lippincott, Harriette Hemmasi, and Vivian Lewis, "Trends in Digital Scholarship Centers," *EDUCAUSE Review*, June 16, 2014.

15. See "Guidelines for Evaluating Work in Digital Humanities and Digital Media."

16. See "Guidelines for the Professional Evaluation of Digital Scholarship by Historians."

17. See "Guidelines for the Evaluation of Digital Scholarship in Art and Architectural History."

Appendix A: Opportunities for Engagement

The following provides a few key examples of the numerous opportunities for engaging with the broader digital humanities community.

Mailing Lists

- Humanist Discussion Group: The longest-running discussion forum for digital humanities, with thousands of subscribers worldwide.

- ACRL Digital Humanities Interest Group: Particularly focuses on the intersection of digital humanities and libraries.

News Aggregators

- Digital Humanities Now: A group of volunteer editors-at-large who curate content from subscribed RSS feeds and Twitter.

- dh+lib: Where the Digital Humanities and Librarianship Meet: An extension of the ACRL Digital Humanities Discussion Group; news curated by guest editors, with an emphasis on the intersection of digital humanities and libraries.

Twitter

A great deal of conversation, news, and community building happens via Twitter, although the details vary for any individual's network. Although it is a few years old, Martin Grandjean's visualization of the Twitter digital humanities network provides an overview of a number of key figures in the network (see "The Digital Humanities network on Twitter: Following or being followed?" August 9, 2014). He also provides a Twitter list—which he continues to maintain—of people who identify as part of the digital humanities community (see Digital Humanities: A Public List).

Professional Organizations

The Humanities, Arts, Science, and Technology Alliance and Collaboratory (HASTAC) was founded in 2002 and has a national and international membership base. While HASTAC emphasizes broader themes than digital humanities, its longstanding success in building cross-institutional community and productively implementing technology within humanities education makes it an important model for consideration.

The Alliance of Digital Humanities Organizations (ADHO) sponsors an annual international conference whose location rotates around the world. Joining ADHO is a matter of joining one of its constituent organizations. A few relevant examples:

- Association for Computers and the Humanities (ACH), the U.S.-based professional society for digital humanities

- Canadian Society for Digital Humanities/Société canadienne des humanités numériques (CSDH/SCHN)

- centerNet, an international network for self-identified digital humanities centers

Training Institutes

- Digital Humanities Summer Institute (DHSI) at the University of Victoria in Victoria, BC, Canada, has run since 2001 and currently offers upwards of 40 week-long intensive workshops in June.

- Humanities Intensive Learning and Teaching (HILT) offers approximately 10 week-long intensive workshops each summer.

Appendix B: Digital Humanities Resources

- Matthew K. Gold and Lauren F. Klein, eds., *Debates in Digital Humanities* (Minneapolis, MN: University of Minnesota Press, 2012 and 2016).

  These volumes bring together essays that first look at digital humanities "theories, methods, and practices and to clarify its multiple possibilities and tensions" and then a closer look at "grappling with DH at the disciplinary level."

- Nancy Maron, "The Digital Humanities Are Alive and Well and Blooming: Now What?" *EDUCAUSE Review* 50, no. 5, September/October 2015.

  See also Nancy Maron and Sarah Pickle, "Sustaining the Digital Humanities: Host Institution Support Beyond the Start-up Phase," Ithaka S+R, June 18, 2014, which is the survey report on which the article is based.

- Barbara A. Rockenbach, "Digital Humanities in Libraries: New Models for Scholarly Engagement," *Journal of Library Administration* 53, 2013.

  This article is an introduction to a full issue of the *Journal of Library Administration* on digital humanities and libraries.

- "Digital Scholarship Centers: Trends and Good Practice," Coalition for Networked Information Workshop, April 2014.

  This report from the workshop includes institutional profiles.

- DiRT: Digital Research Tools

  The DiRT Directory is a registry of digital research tools for scholarly use.

- Edward L. Ayers, "Does Digital Scholarship Have a Future?" *EDUCAUSE Review* 48, no. 4, July/August 2013.

  This article discusses what digital scholarship is and its role in the academic landscape.

- Michael R. Roy, "Either/Or? Both/And? Difficult Distinctions within the Digital Humanities," *EDUCAUSE Review* 49, no. 3, May/June 2014.

  This article asks how digital humanities fits into the evolving landscape of higher education and whether it is a revolution or an evolution of the world of humanities computing.

- "Here and There: Creating DH Community," Miriam Posner blog, September 18, 2014.

  This is a blog post of the keynote Posner gave to the Digital Frontiers 2014 conference at the University of North Texas.

- Miriam Posner, "No Half Measures: Overcoming Common Challenges to Doing Digital Humanities in the Library," *Journal of Library Administration* 53, no. 1, 2013.

  This article covers the administrative and institutional factors influencing the ability for digital humanities professionals to succeed.

- William Pannapacker, "Stop Calling It 'Digital Humanities'," *Chronicle of Higher Education*, February 18, 2013.

  This article includes suggestions for program building in the emerging field of digital humanities.

- "Supporting Digital Humanities," Report of a CNI Executive Roundtable Held December 7–8, 2014, May 2016.

  This reports on a roundtable meeting focused on how to institutionalize support for digital scholarship in the humanities. See also Clifford Lynch, "What We Heard at the Roundtable: Transcript of a Project Briefing," December 9, 2014.

- Nancy Maron and Sarah Pickle, "Sustaining the Digital Humanities: Host Institution Support Beyond the Start-up Phase," Ithaka S+R, June 18, 2014.

  This study assesses the role that higher education institutions are playing as faculty and staff continue to create digital resources.

- Bethany Nowviskie, "Too Small to Fail," blog post, October 13, 2012.

  This blog post is the text of a keynote from the Japanese Association for Digital Humanities conference focusing on the University of Virginia's Scholars' Lab.

- Joan K. Lippincott, Harriette Hemmasi, and Vivian Lewis, "Trends in Digital Scholarship Centers," *EDUCAUSE Review*, June 16, 2014.

  This article presents case studies of digital scholarship centers.

- Bryan Sinclair, "The University Library as Incubator for Digital Scholarship,"
  EDUCAUSE Review, June 30, 2014.

  The article posits that the library is home for support and promotion of digital
  scholarship.

- "What's In a Name: What Do You Call Your Digital Scholarship Center?"
  ACRL Digital Scholarship Centers Interest Group, webinar, March 30, 2016.

  This is a discussion of centers at Georgia State University (CURVE) and
  University of Michigan (Shapiro Design Lab).