# PROJECT BAMBOO SCHOLARLY PRACTICE REPORT

## 1 SCHOLARLY PRACTICE

The Bamboo Planning Project brought together scholars, IT professionals, and librarians from around the world to chart a direction for cyberinfrastructure development in the humanities. In the first workshop (Workshop 1), held four times between April and July 2008, participants responded to a series of broad, open-ended questions[1] spanning the common and uncommon in scholarly practice, innovative and future practices, and opportunities and challenges for the "digital humanities" moving forward. While the primary goal of the first workshop was to gather information that would provide a foundation for the subsequent workshops in the Bamboo Planning Project, the scribe notes provide a rich corpus of data[2] to support the ongoing analysis of scholarly practice.

This report provides a distillation of the themes of scholarly practice that emerged in Workshop 1, situated within the framework of the "scholarly primitives" proposed by John Unsworth and the OCLC's "scholarly information activities". It also includes a discussion of current and emerging trends, and areas where new technological and social developments were seen as desirable.

### 1.1 THEMES OF SCHOLARLY PRACTICE

John Unsworth's high-level scholarly primitives and the related scholarly information activities laid out in Palmer, Teffeau and Pirmann's 2009 OCLC report, "Scholarly Information Practices in the Online Environment: Themes from the Literature and Implications for Library Service Development", provide two useful analytical

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[1] There was some variation in phrasing between workshops. The questions posed to participants, are as follows. 1. Based on what you have heard at the table and read from the proposal, what one or two questions, observations and hopes would your table like to share with the group? 2. As a researcher, librarian, IT professional, computer scientists, etc.: During a really good day, term, research cycle, etc. what productive things do you do in relation to humanities research? 3. What are common themes that have emerged from your exploration of scholarly practices? Based on your discussion of scholarly practices, what are two themes that piqued the curiosity of those at your table, or are uncommon? What makes these themes common and uncommon? 4. Unpacking a commonality. What discrete practices are involved in this theme? What outstanding issues need to be addressed in regards to this theme? 5. Unpacking the uncommon. For whom/which disciplines or areas of study is this theme helpful? What discrete practices are involved in this theme? What outstanding issues need to be addressed in regards to this theme? 6a. When you look at new-hires or up-and-coming graduate students, what practices do they use that are different from yours? 6b. If you had a magic wand, what would make your day, term, research cycle more productive in relation to research? 7. Discuss which future practices / activities you think would be best supported by a consortial effort like Bamboo and explain why.

[2] Scribe notes from all five workshops are available on the Bamboo Planning Project wiki. Selected quotes from the planning project are also available in thematic groups on the Bamboo Program website. All data from the facilitated discussion break-out groups and report-out sessions was anonymized to encourage participants to speak freely, and quotes used in this report use the standard citation format found on the wiki and website: exercise number, workshop number, letter identifying the break-out group.

frameworks for contextualizing the "themes of scholarly practice" identified through the Bamboo Planning Project. These themes were collaboratively developed by scholars, librarians, and IT professionals who sifted through the scribe notes looking for commonalities after Workshop 1. The themes of scholarly practice and the directions for Bamboo that developed out of those themes formed the basis for initial discussion at Workshop 2 in October 2008.

The table below maps the Bamboo themes to both the Unsworth primitives and OCLC scholarly information activities.

| **Bamboo theme of scholarly practice** | **Unsworth primitive** | **OCLC scholarly information activity** |
|---|---|---|
| Gathering / Foraging | Discovery | Searching (direct searching, chaining, browsing, probing, accessing) |
| Synthesizing / Filtering | Comparing<br>Sampling | Collecting (gathering, organizing) |
| Contextualizing | Referring | Searching (chaining, browsing, probing)<br>Collecting (organizing)<br>Cross-cutting (monitoring) |
| Conceptualizing, Refining and Critiquing | Illustrating<br>Representing<br>Comparing | Reading (scanning, assessing, rereading)<br>Cross-cutting (notetaking, translating)<br>Writing (assembling)<br>Collaborating (consulting) |
| Documenting methods | Representing | Writing (disseminating)<br>Cross-cutting (translating) |
| Managing data | Discovering<br>Referring<br>Representing | Searching (accessing)<br>Collecting (organizing)<br>Collaborating (coordinating, consulting) |
| Annotating / documenting | Annotating | Writing (assembling)<br>Cross-cutting (notetaking) |
| Modeling / visualizing | Illustrating<br>Representing | Cross-cutting (translating)<br>Writing (assembling) |

| | | |
|---|---|---|
| Overlapping teaching and research | Representing | Collaborating (coordinating)<br>Cross-cutting (translating) |
| Sharing / dissemination / publishing | Representing | Writing (disseminating) |
| Funding | Suggested parenthetically[3] | No analogue |
| Collaborating | Common thread throughout scholarly primitives, not listed separately | Writing (co-authoring)<br>Collaborating (coordinating, networking, consulting) |
| Citation, credit, peer-review | Referring | Reading (assessing)<br>Writing (dissemination)<br>Collaborating (consulting) |

## 1.2 Bamboo Themes and Scholarly Needs

The themes identified here were compiled between Workshop 1d and Workshop 2 of the Bamboo Planning Project. The data behind the themes are available in an online database[4]. Subsequent to Workshop 2, participants in the Bamboo Planning Project developed a rich body of narrative materials that further illustrate scholarly practice; these narratives can be found on the project's wiki[5] but are distinct from the Workshop 1 materials considered as the basis of this report.

### 1.2.1 Gathering/Foraging

During Workshop 1, the words "gathering" and "foraging" emerged as alternatives to "searching" that better captured the way a scholar's path of discovery may branch from one topic or item to another. Scholars noted that the bibliographic tools available to them were not naturally compatible with this discovery process[6]. A database search tool that has been optimized to show the most "relevant" results given certain keywords may in fact be considered less useful insofar as it reduces the role of serendipity. Furthermore, the choice of algorithm used by the search tool may unexpectedly introduce bias, and without access to the algorithm the scholar has no way of knowing or compensating[7].

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[3] "[P]erhaps, come to think of it, my list of scholarly primitives should include the age-old scholarly activity of 'begging'." (Unsworth 2000)
[4] https://themes.projectbamboo.org
[5] https://wiki.projectbamboo.org/display/BPUB/Scholarly+Narrative+Repository
[6] "We have a lot of bibliographic tools, and they don't accomplish what I want: finding things not as structured by pre-existing description" (Ex 4, 1d-E)
[7] "When I'm a researcher, I'm always worried that my research findings are biased. Technology increases this problem." (Ex 6b, 1b-D)

Workshop participants felt that digital foraging had the potential to open up new avenues of discovery, but the current tools available fail to measure up to their analog counterparts in a number of important areas: "Marginal notes, highlighting, post-it notes; [...] you can walk around a library, spot new things easily [...] mining footnotes, you can flip through a book looking at the bottom inch [...]taking a set of articles and looking only at the first and last paragraphs, abstracts. [...] A database doesn't lend itself well to that."[8]

Participants wanted to search across traditional boundaries (subject area, media type, repository source), and use concepts as the search input, to allow for the tracing of an idea over time and space, regardless of the form or phrasing used to express it[9]. They also proposed alternative discovery approaches such as a "digital concierge"[10] that would bring relevant content to the scholar's attention as it became available, and federated/deep/semantic search capabilities[11] combined with a rich thesaurus[12] that would enable the scholar to find relevant information regardless of what vocabulary was used to tag it.

### 1.2.2 SYNTHESIZING/FILTERING

Synthesizing and filtering are scholarly practices that can either stand alone or be treated as part of the gathering/foraging process. Effective automated filtering is of growing importance as more materials are being digitized; workshop participants were concerned about whether search tools' filtering capabilities are "keeping up with the rate of proliferation of digital data."[13]

Potential areas of work include the development of tools that "coordinate the activities of many fields and filter them through [the user's] field"[14] and incorporate relevance judgments made by subject-matter authorities[15] in the search-result ranking algorithm. One participant wanted a single place for reviews of digital resources, possibly

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[8] Ex 4, 1d-F

[9] "Computer technologies are up to conceptual levels we are working on, so we don't have to "bow down" to technologies. Searching, for instance, according to concepts instead of text. So that computers can support scholars at the level at which we're working" (Ex 6b, 1c-A)

[10] "Digital concierge" [...] "Expose digital assets (includes people, tools, content) across institutions [...] across disciplines, engages multi-dimensional search" (Ex 7 flipcharts, 1a-D)

[11] "Search across data/collection silos, as if they were all one searchable body of information" (Ex 6b, 1a-F); "Federated/deep search across DBs" (Ex 6b, 1a-G); "Better search engine, comprehensive." (Ex 6b, 1b-C); "better searching abilities across resources" (Ex 6b, 1d-E)

[12] "Biggest stumbling block is data structures and metadata. I would have a data architecture that would fulfill everyone needs and populate them with robust metadata." (Ex 6b, 1b-C); "global schema to which local heterogeneous schemas can be mapped. a very conventional old-fashioned database problem. is there an appropriately abstract and universal global schema that would let you map local taxonomies to a more general taxonomy." (Ex 4, 1b-B)

[13] Ex 1 group sharing, 1c

[14] Ex 2, 1a-E

[15] "Non-machine evaluations can be helpful - a selector (a person) helps you know what might be relevant in a way that simple cataloguing, subject headings, cannot." (Ex 2, 1d-F); "In tentatively data-mining things, I would like to be able to call on scholars to evaluate results." (Ex 6b, 1c-B)

combined with a tool that could act as a "gatekeeper"[16] – showing only well-reviewed resources. While there was a great deal of enthusiasm for the development of better filtering capabilities, participants were quick to note that the scholar must remain the ultimate arbiter of what is and is not relevant, and automated filtering is most trustworthy when the factors influencing its ranking are transparent to the end-user[17].

### 1.2.3 CONTEXTUALIZING

Workshop participants described contextualizing as "[p]ositioning [research] within [the context of extant] secondary sources, defining valuable research space"[18] and "discover[ing] relationships between research artifacts, sources, elements, images... causal relationships"[19]. Participants saw contextualizing and understanding "messy context"[20] as one of the cornerstones of their scholarship.

Scholars expected that they themselves would be doing the analysis[21], but they hoped to someday make use of tools that would gather together the materials necessary for a more exhaustive analysis than is currently possible using today's information retrieval methods[22]. Such a tool might trace a meme throughout a large artifact-space spanning great breadths of place and time[23] or "find all the (Chinese) texts that exist relevant to a subject, in rank order of relevance, and then all the secondary work that has made use of those texts, and then [fully annotate a chosen text] for dates places persons titles whatever else."[24]

### 1.2.4 CONCEPTUALIZING, REFINEMENT AND CRITIQUE

Scholars' conceptualizing, or "sense-making", was described as a "process of interpretation [that] almost inevitably involves a process of musing, proposing (if only to oneself) an interpretive framework, musing further, seeing how the initial framework

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[16] "Tools to decide which digital resources to use (reviews) don't exist the way they do in print. Bamboo could serve as a sort of gatekeeper; out of fashion but useful." (Ex 4, 1d-F); "Not just a Google for tools, but also some sort of evaluation already done by scholars, technologists and information scientists." (Ex 7, 1c-B)

[17] "Want to see program reflect in importance for given data, so certain info given more weight, certain author given more weight, etc." (Ex 1, 1b-D)

[18] Ex 2 flipcharts, 1a-A

[19] Ex 2, 1a-A

[20] Ex 4/5 flipcharts, 1c-A

[21] "Can make a big pile of stuff, but narrative is the added value of the researcher." (Ex 3, 1c-B)

[22] "How do people in specialized areas find where the valuable digital resources are? Before, they relied on catalogs; you don't have that same organization now. Magic clearinghouse. Something beyond Google; it's pretty good, but it doesn't pick up everything. Difficulty of knowing who's doing what; what's been presented; what research is in progress that you can benefit from, contact, tag onto" (Ex 6b, 1d-C)

[23] "Identifying patterns, relationships across sources; this includes allusions, references, quotations, images, . This should include chonological references across media and time. The word data gives people in the humanites that content is interchangeable. I'm talking about vague references and specific citations. Identifying resonances; Identifying sources is a task within this practice" (Ex 2, 1a-B)

[24] Ex 6b, 1d-D

fails to sufficiently explain the subject of inquiry, reframing the interpretive framework, and cycling through again ... as the framework is shared with others, there may be [critique] involved that spurs reinterpretation."[25]

Of the scholarly practices, conceptualizing was seen as an inherently personal one, conducted largely in solitude[26]. While technology might not facilitate the process, it may play some role in making the results more transparent: "'Sense-making' is so fundamental to humanities scholarship ... but still Bamboo might provide a decoration of responsibility-trails and accountability for data and analysis in humanities scholarship."[27]

### 1.2.5 Documenting Methods

Documenting methods is a scholarly practice whose importance increases as scholars make use of tools that will eventually become obsolete. Documentation created today provides context for tomorrow as future scholars "recreate past methodologies"[28] and "identify places where learning about error can enrich the process of research [and] enable constructive forward movement."[29]

While university libraries are increasingly providing archival storage for traditional products of scholarship, these archives often exclude "scholarly ephemera" such as methodology documentation, conference slides, raw data and notes[30]. Storage is not the only problem: there is also a lack of incentives for scholars to write comprehensive documentation and preserve ephemera. As one participant explained: "It's hard to put one's research materials in coherent order for presentation to a library ... there's no credit in doing this work ... the library might not know how to take care of it ... what's a suitable archive in which materials can reside? [... where is the] credit for depositing data when developing research?"[31]

Participants noted the potential of treating the sharing of ephemera as an aspect of the developing practice of scholarly networking: "Not just sharing data, but sharing one's particular take on the data. Archives of conference papers, electronic working papers like the sciences do. Registry of research activities as part of this social networking activity – pre-print, awareness of area of work and particular argument, approach, methodology."[32]

### 1.2.6 Managing Data

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[25] Ex 4, 1c-C
[26] "Humanities Scholarship is a solitary pursuit" (Ex 2, 1b-E)
[27] Ex 4/5, 1b. See also section 1.2.13, Citation, Credit and Peer Review.
[28] Ex 3, 1b-I
[29] Ex 5, 1b-C
[30] "Submit what one has done to an archive so others can see it. Not just in a large, structured appendix. One's university library might not take these extra materials, depending on policy." (Ex 2, 1a-C)
[31] Ex 2, 1b-C
[32] Ex 2, 1a-C

Even when working exclusively with print materials, scholars have always needed to manage large collections of eclectic data and reshape them in different ways to meet specific needs[33]. The advent of digital resources has complicated this task; one discussion group cited issues relating to "sustainability, preservation, maintenance, succession ('estate planning'), migration"[34]. When changing universities, a scholar may lose access to crucial sources of data due to differences in library subscriptions[35]. As long-term projects evolve, earlier states and may not be recoverable[36]. A multimedia archive without any contextual metadata may be rendered all but useless if the managing faculty members retire[37].

Some of the problems relating to data management cannot be addressed to the fullest extent without the relevant communities of scholars re-assessing current cultural practices that often de-prioritize the development of documentation and reusable metadata[38]. Putting an incentive structure in place would be one step in this direction[39]. Regardless, there is a need for tools to enable "conversion, versioning, repository archive services, metadata schema harmonizing, presentation and visualization, licensing, and citation."[40]

### 1.2.7 ANNOTATING/DOCUMENTING

Annotating and documenting are an important, if idiosyncratic, part of the scholarly workflow. One scholar described it as "light reading: sometimes it means knowing what you want to photocopy; highlighting; adding notes in margin; brows[ing] stacks with a call number range; [reading the] first and last paragraph; [seeing the] context in which an article appears (other articles in the journal edition); quick and

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[33] "I have different sites. Stacks of printed articles. I don't like to read online. They are much more comfortable reading online. I use a lot of paper." (Ex 6a, 1a-C)
[34] Ex 7, 1a-D
[35] "Students don't always understand the big investment U[niversities] pay for online journal access. To what extent are online journals a scholarly source for research? Authors are cited much more when journals are online. In [technological fields] no one uses journals because too old by the time it's published. Parallel systems exist." (Ex 6b, 1a-G)
[36] "The durability of data often gets left out. Application designer has to account for the durability of the information. It's all about putting repositories under everything. It's about packaging in a way that's abstract enough from the technologies you're using at the moment. the abstractions have to evolve. The way the data is stored affects how the information is used. but the abstractions should evolve at a slower rate than the technology" (Ex 7, 1d-C)
[37] "Archives w/ no clue of what that was at [large university]. Images of classical landscapes, slides from all over Europe -- don't know what that was. It was folklore, and knowledge base disappears with retirement of faculty. Impulse that made person take it is gone." (Ex 1, 1d-B)
[38] "Working on a multidisciplinary project in Northern Australia: anthropology, biology, zoology, fire scientists, and me as an ethnographer. Started to establish a mountain of data. Got some correlation of our respective stuff, aim to store but to also interrelate across disciplines. Failed to get each of us to do sufficient annotation of our material. Ran against this again and again. Hard reality to properly document info, this is the one thing we failed to do." (Ex 2, 1d-D)
[39] "Credit for depositing data when developing research" (Ex 3, 1b-C)
[40] Ex 7 flipcharts, 1a-C

fluid"[41] and noted that current methods for doing this in a digital environment are insufficient[42]. The lack of "digital post-it notes"[43] that can be shared across different databases was specifically mentioned as one example of these shortcomings.

Participants noted that even taxonomies currently considered authoritative are "historically contingent products of scholarship that are ultimately ephemeral"[44] and they asserted the value of folksonomic metadata[45]. Participants expressed interest in making the annotation process more social through the development of a Wikipedia-like communal annotation environment[46]. Some participants advocated for looser restrictions on who can edit the metadata in digital collections and suggested the possibility of crowdsourcing metadata correction[47].

### 1.2.8 Modeling/Visualizing

Visualizing data is a scholarly practice that has recently become widespread, as tools are now available for scholars to "compare content that otherwise had to be described."[48] The goal of modeling and visualization is to "make the invisible visible,"[49] be it through the juxtaposition of physically distant objects[50] or displaying data sets in such a way as to reveal certain patterns[51].

Workshop participants were aware of the possibility of adopting visualization tools designed for other disciplines (including the sciences, architecture, and medicine) for use in the humanities[52]. Rather than asking for entirely new tools designed specifically for humanities visualizations, they expressed interest in seeing existing tools reworked with a more "humanities-friendly" interface[53].

### 1.2.9 Overlapping Teaching and Research

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[41] Ex 4 sharing, 1d-E
[42] "We need bibliographic file management that fits idiosyncratic workflows" (Ex 3, 1b-C)
[43] Ex 3, 1d-F
[44] Ex 4, 1b-B
[45] "Museum curators provide one way of classification, invite help from public to do tagging that the public finds relevant" (Ex 1, 1c-E)
[46] "[I am] studying wiki[s], users [are] creating vetted info. Give communities ability to tag and share knowledge. Don't ignore community aspect and social aspects." (Ex 1, 1d-B)
[47] "Engage users in folksonomic tagging, giving meaning to a scholarly object, identifying the value or significance of a scholarly object. Engage people in disambiguation or correction of non-automatable data--might look to a member of the public like "playing a game" (Ex 4, 1b-C).
[48] Ex 6a, 1b-C
[49] Ex 4/5, 1c-B
[50] "Virtual reunification of artifacts (address cultural issues?)" (Ex 2/3 flipcharts, 1c-F)
[51] "One of the things that technology brings a benefit in is: when you have a huge pile of material, the unassisted person can only scope one thing at a time, can only see things in the order they come. Technological assistance can help see patterns across materials." (Ex 4, 1c-A)
[52] "Take advantage of new kinds of structure: GIS, for example. Invented for physics, but no reason you can't use it for humanities. Visualizations. Frontiers." (Ex 4, 1c-A)
[53] "Maybe creating a humanities front end to some scientific tool e.g., a visualization tool to make it work for the humanities." (Ex 1, 1b-H)

For many scholars, research influences teaching; when their research includes the use of tools and digital resources, those tools become part of their pedagogy as well[54]. Visualization and data mining tools provide an opportunity even for undergraduates to engage in original research[55], or contribute to the faculty member's work. Tools that require relatively little in the way of computing resources or that can be shared across institutions are equally accessible to students in Tier 1 institutions and small liberal arts colleges with a long tradition of involving students in research[56].

From a technology angle, incorporating one's research into teaching involves either no specific tools (i.e. discussing one's research practices with students, though this may also take place in technology-mediated ways[57]) or tools discussed elsewhere (relating to annotation and bibliography, visualization, etc.). In an article appearing in an issue of *Digital Humanities Quarterly* from which a number of scholars' narratives of practice were drawn at a later stage of the Bamboo Planning Project, Christopher Blackwell and Thomas R. Martin describe a case that illustrates this theme in "Technology, Collaboration, and Undergraduate Research."

### 1.2.10 SHARING/DISSEMINATION/PUBLISHING

Disseminating one's scholarship through printed publications has historically been a critically important element of scholarly practice[58]. While electronic publication and non-traditional forms of scholarship (tool development[59], mashups[60], websites and blogs[61], and other digital media[62]) are slowly gaining acceptance, the printed publication

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[54] "Once faculty get involved in projects, then their teaching is transformed. Get the faculty on using technology in their research and they'll bring it in to the classroom. Getting them involved with the library really helps." (Ex 6a, 1d-C)

[55] "Teaching isn't really talked about at this conference, but using digital technologies for their ability to help students perform active research independently. I've had faculty who center on a seminar structure say their research and teaching are inseparable -They teach their research, their teaching informs their research" (Ex 6a, 1d-D); "We're now having students producing very valuable technology and research that "doesn't count" for anything. The work that students do makes them more valuable in the marketplace, but not necessarily in the academy." (Ex 4, 1d-D)

[56] "How do we involve students? This is always an expectation/assumption in the sciences. How do we do this in the humanities? Very strong tradition at small liberal arts colleges." (Ex 4, 1d-A)

[57] "New hires want to communicate w[ith] students via blogging, IM. Faculty is posting everything teaching related." (Ex 6b, 1a-G)

[58] "Publishing was in two forms, books and articles. now there's creation of databases." (Ex 3, 1d-F)

[59] "But is there historical record of tenure and promotion for tool building? Leading examples of tenure granted is tied to co-publication of traditional articles and online tools and enhancements. Can we look to, support, and build on these." (Ex 6b, 1d-A)

[60] "There are people out there who might hear your cry in the wilderness 'I won't write two books, but I'll mash up five pieces of art and make something of lasting value'"" (Ex 6b, 1d-C)

[61] "In archeology [there are] profs who've developed web sites and blogs for students at expense of publishing, denied tenure as a result" (Ex 6a, 1d-E)

[62] "publish in print and conference presentations ("non-linear multimedia presentation" - digitized media and digitized text, all essays have begun as presentations; multimedia archive projects - video archive and video annotation. ...most digital humanities projects do form the basis of scholarly research." (Ex 2, 1d-C)

still remains the gold standard for the dissemination of scholarship. In this transitional period, the scholar must navigate a number of conflicting interests. Sharing one's ongoing research can lead to valuable feedback[63], but it may also put one's ideas at risk of being appropriated by competitors[64]. This is particularly problematic for dissertations – "[since] a requirement of a dissertation is to prove novelty, there's a disincentive to share."[65] Some scholars expressed feeling "held hostage by commercial publishers;"[66] since their tenure depends on publication, they feel compelled to accept whatever terms the publisher demands, even if it means they lose the right to disseminate their work through other channels[67].

Technology that enables widespread dissemination, discussion, and reuse of the products of scholarship has been a driving factor behind the changes in scholarly publishing[68]. To support and encourage the uptake of these new methods of scholarly dissemination, better methods for tracking chains of credit (particularly relating to materials used in mashups – transformative works consisting of materials drawn from pre-existing sources)[69] will need to be developed. The issue of sustainability will also need to be addressed – what happens to a project if the library no longer wishes to support it?[70]

Radical changes to the current print-focused publishing model are ultimately more dependent on cultural changes than technological developments. As a consequence of an earlier era when all serious peer-reviewed journals also published paper volumes, a perception remains that a peer-reviewed journal published only on-line is less legitimate[71]. A more fundamental change relates to the practice of valuing scarcity: "a thing that is little-studied is of more value than something that has been thoroughly

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[63] "intellectual networking: share & discuss pre-pub, converse with divergent communities, collaboration -- find collaborators, find & form invisible colleges, talking about/giving feedback about research" (Ex 3, 1b-A)

[64] "Willing to blog, but publishing what they're thinking about [leads to scholars becoming] paranoid about [their] idea being stolen. People think 'because this is true, I must get this out in attributive form as soon as possible, then rework"'-- [it is important to get] credit first." (Ex 6a, 1c-C)

[65] Ex 6b, 1a-G

[66] Ex 1, 1b-B

[67] "JDs need to be hired in Libraries to provide information for faculty. Faculty can be educated on how to protect their IP and re-negotiate the contracts with publishers." (Ex 4, 1b-E)

[68] "Humanities is about interpreting, it's not about transferring knowledge. If an institution is involved in teaching and learning, the old school is dissemination in lecture hall. New school is open-ended on the web." (Ex 3, 1c-B); "Make one's scholarly product available 'for free' ... employ open forms of distribution ... 'give stuff away' ... perhaps use of humanities zines and blogs instead of scholarly journals is a practice that will catch on." (Ex 5, 1b-C)

[69] "How do we back out of these mashups to get back to the original data? And how do you give people relative credit (Big issue for tenure)" (Ex 6b, 1a-D)

[70] "[I have] A colleague with [a database] of 5000 women writers in China, with references to the writings. [A] new librarian decides "we don't want to support this". What's the clearinghouse to support dissemination if a project loses support? We need to solve the dissemination problem. (Ex 3, 1d-F)

[71] "If you manage online publications, must be sure all standards are in place, and must be higher than standards of print. Without clear standards, people will not publish to online journals, feeling that this is the 'bottom' in terms of publishing." (Ex 2, 1c-A)

chewed over"[72] but in a digital world "value does not derive from rarity but from ubiquity"[73]. More scholars would be willing to open up their data if it would accrue value through reuse[74].

### 1.2.11 FUNDING

Workshop participants identified the process of seeking funding – identifying funding sources, writing grant proposals, writing follow-up reports – as a time-consuming but necessary part of the scholarly process[75]. While most scholars seek funding at some point for travel or research[76], those involved in digitizing content, developing tools, or building on-line resources must continually seek funding for the duration of the project, as well as resources to sustain the project once it is completed[77].

Participants felt that a system that automatically kept the information frequently submitted as part of grant proposals (such as CVs, research statements, etc.) up to date[78] would help reduce the paperwork burden involved in applying for funding. Such a system could also be employed to facilitate the tenure review process.

### 1.2.12 COLLABORATING

Scholars' approaches to collaboration vary widely. Some feel that the very nature of humanities scholarship does not lend itself to collaboration[79]. Others actively use blogs, social networking sites, and Twitter to solicit feedback on their research[80]. One group mentioned "invisible colleges" of like-minded individuals who work at different

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[72] Ex 4, 1b-C
[73] Ex 1, 1a
[74] "If you made it accessible socially and could get citation credit for someone else using it, does it make the benefit higher? If they could use their annotation. Rarely does credit trickle down to individuals who do the work." (Ex 5, 1c-D)
[75] "Grant applications and reports. This is a significant, huge piece of our work. 'Ninety-percent of early phase project work is seeking funding.'" (Ex 2, 1d-B)
[76] "getting a little money is important ... to make trips to archives." (Ex 2, 1b-C)
[77] "Funding issue; unlimited funds so things we do can be sustained. Current funding models (projects, seed money, generous one-time grants) aren't conducive for making these things part of our regular life. Too many things fail after initial funding is over. Sustainability and durability (means you're using it and it's still ok)" (Ex 6b, 1d-C)
[78] "Streamlined way to do grant applications. info gathering, working with same people over again but still have to gather info. updated cv's etc. part of a broader problem of name authority, lib. of cong. no longer does name authority, this john smith is the same john smith that does history projects... templated workflow would be good but want even more automation. system should recognize who i am, update my publication records, feed into the granting system so i don't have to fill out the application by cut and paste. comparison to common application for undergraduates. "write the essay once and it gets stored". grant application process is one "client" for this; tenure application process another" (Ex 7, 1d-E)
[79] Ex 1, 1d-D
[80] "There's a blurred, fluid movement between social and other networking for interactions. Tremendous use of FaceBook, MySpace for things, including research. Their interests are interwoven: can't easily separate personal & research interests." (Ex 6b, 1a-G)

institutions[81]; similarly, another group noted the potential contributions that could be made by enthusiasts, amateurs, and independent scholars[82]. Collaboration was also seen as one method of giving scholars at smaller institutions access to resources they would not otherwise have[83]. Collaboration is not without its risks-- it is less clear how credit is to be assigned for a collaborative work[84], partly because the practice may be unfamiliar for senior scholars who serve on tenure and review panels[85].

Some participants expressed interest in building new social networks for scholars[86] whereas others focused on the potential of integrating collaborative features directly in the tools they use for research (annotation, bibliographic tools, visualization tools, etc.[87]). Others were interested in leveraging the general social networking sites scholars already use[88]. Granular privacy settings were acknowledged to be a prerequisite for any collaborative research tool to gain widespread acceptance – many scholars were concerned about restricting both their audience and what content their audience was allowed to see[89].

### 1.2.13 CITATION, CREDIT, PEER-REVIEW

The credit a scholar receives for his or her work is the currency that moves a career forward and builds a reputation in the scholarly community. It is a powerful motivating force for participation in a project, but participation can be put in jeopardy if there is a perception that credit will not be given appropriately. Scholars attributed their colleagues' reluctance to engage in "digital humanities" to an institutional policy of giving less credit – or no credit at all – for work on digital projects[90].

Workshop participants saw better technologies for tracking use and reuse of digital scholarship as necessary for institutional recognition of the impact of digital

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[81] Ex 3, 1b-A
[82] "NYPL doesn't have faculty ('library for the unaffiliated') [might Bamboo be a] gateway for enthusiasts and amateurs and independent scholars, non-university universities" (Ex 1, 1d-F)
[83] Ex 3, 1b-F
[84] "Credit is difficult w/ collaboration" (Ex 1, 1c-E)
[85] "Collaboration is now more important to researchers. Previously [they] worked more individually [and they] need to unlearn those habits. New medium is somewhat threatening because research used to be a solo activity. Now [they] have to work with technology people, etc. Threatenting to the way we've been trained to work for 40 years. " (Ex 2, 1d-G)
[86] "Develop a social network for A&H research" (Ex 7, 1a-A)
[87] "Social networking/sharing of citations and annotations applied to research environments across institutions." (Ex 6b, 1d-A)
[88] "There's a blurred, fluid movement between social and other networking for interactions. Tremendous use of FaceBook, MySpace for things, including research. Their interests are interwoven: can't easily separate personal & research interests." (Ex 6b, 1a-G)
[89] "In the humanities, [we] want to play it closer to the vest; I want a safe place to collaborate. I only want to share with the people I want until I'm ready to publish. I want to decide when I'm ready to move it to an archival space with metadata; decide what's worthy." (Ex 2, 1d-G)
[90] "Difference between hired and getting tenure. All want someone who knows technology, but won't necessarily give that person tenure. It's the personnel committee who I worry about, not my dept. Mentors will dissuade technology work and encourage to work toward tenure." (Ex 6a, 1d-F)

scholarship. Currently, there is no standardized way to acknowledge the various data sources that go into a mashup[91]. A scholar may be able to track the number of downloads from his own web site, but there is no way for him to know that his work is being distributed to a wider audience through other channels (such as Blackboard)[92]. However, while individual scholars were interested in detailed usage statistics for their own work[93], they felt that a system that tracked their access and use of others' materials would be a violation of their privacy[94]. A compromise approach that provided anonymized statistics would introduce a problematic element of uncertainty; if the tenure committee can't tell whether a scholar's paper was used in a graduate seminar at an Ivy League institution or in a course at a community college, they cannot assign credit accordingly. The value of the trade-offs between privacy and tracking the impact of one's scholarship will likely be an important topic of debate in coming years.

## 1.3 TRENDS AND OPPORTUNITIES FOR CROSS-INSTITUTIONAL COLLABORATION

Some of the social and technological developments that could facilitate scholarly practice can and must develop within individual institutions – in the case of library archiving and access policies, local control over the decision is crucial. However, workshop participants expressed interest in a number of areas that might be best tackled collectively by institutions sharing tools, data and resources, supporting communities of scholars, librarians and IT professionals, and collectively negotiating with outside entities.

### 1.3.1 CONNECTING CAMPUS INFRASTRUCTURE WITH LARGER TRENDS, REGARDLESS OF THE SIZE OF THE INSTITUTION

Participants noted that smaller institutions are at a disadvantage given the infrastructure necessary to develop and/or implement resource-intensive new technologies. Shared technology services that do not rely on "homegrown infrastructure"[95] could bridge the gap between "haves and have-nots"[96] by enabling

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[91] "How do we back out of these mashups to get back to the original data? And how do you give people relative credit (Big issue for tenure)" (Ex 6b, 1a-D); "Issues around citation and referencing of data sets and other materials. There are layers of interaction around primary data/sources. Hard to represent the pedigree and citation trail of work around many sources. Would like to see new interesting models around citation around these sources. Would have to be thought leader to push new models and infrastructure" (Ex 7, 1a-H)

[92] "Sustainability leads into problem of credit. If I make a copy, original site can't track usage. Example of one copy going to blackboard, 500 untracked copies go out." (Ex 3, 1d-F)

[93] "Track public use of a scholar's work in order to attach value to her/him vis-à-vis tenure review" (Ex 4, 1b-C); "see that you've had an impact" (Ex 2, 1b-A)

[94] "Danger that [a background tracking mechanism] will turn humanities academics against the project because of the idea that they'll be monitored. Any given humanities scholar would hopefully come down on both sides of the question. Good [for a scholar] to know [her/his] impact, while at the same time not wanting to feel 'watched' or 'tracked'" (Ex 3, 1c-B)

[95] "A small institution can't support brilliant scholarship with homegrown infrastructure ... what consortial work can support (diverse / unique) scholarship" (Ex 1, 1b-C)

faculty at a teaching institution to make use of the same resources available to Tier 1 research institutions[97].

### 1.3.2 Partnerships between IT and humanities

Comments from both IT professionals and faculty speak to the need for better communication between the two groups. IT professionals would like to collaborate with scholars as equals; as one participant explained, "Sometimes I feel I have solutions in search of a problem. [I need to] find ways to share them with faculty, [and look] for an intellectual context on which to hang my technology solutions."[98] A faculty member's description of a similar situation illustrated how such an interaction can go awry: "IT people come in and say we have all these good tools-- so what? You haven't heard the problem yet."[99] Other faculty wanted their institution's IT professionals to be more involved in collaboration, but felt they were too focused on day-to-day support[100]. Both groups described situations where one or the other had made incorrect assumptions or failed to ask the right questions, which put projects in jeopardy[101]. While building partnerships between individual IT professionals and scholars is an inherently local activity, a successful strategy for fostering those partnerships at one institution may benefit other institutions. Furthermore, the impact of faculty-IT partnerships can extend beyond the original participants when these participants recount their positive experiences to their colleagues outside their institution.

### 1.3.3 Helping scholars share ideas and solutions

Workshop participants sought both technology-mediated and face-to-face forums for sharing ideas and solutions with colleagues. Participants mentioned IEEE, ACM, and ACM-SIGGRAPH as good examples of technology groups that hold "[p]eriodical, predictable meetings ... you know when and where you can go to learn about projects."[102]

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[96] "Haves and has-not divide between large and small institutions" (Ex 1, 1b-C)
[97] "Most compelling passages in the proposal was the part where someone at a teaching institution could make use of the same resource available to the Tier 1 Research institution." (Ex 1, 1b-F)
[98] Ex 1, 1b-F
[99] Ex 4, 1c-A
[100] "Move IT away from 'your desktop is failing' to 'let's teach your students to know 3 standards'" (Ex 1, 1b-E)
[101] "Technical staff has different understandings of the workflow. We need more detail than they provide: how it should actually work or look like (output, UI, how much detail/support, how much knowledge the users need, knowledge users don't have.) One project has requirements that work only on old Power PC Macs > software ceases to exist (20 year project) > Trying to separate UI from hardware. Tension from both sides. Specificity of scholar's question has ramifications. Too abstract: programmer makes choices that may not work. Too much specificity: constraining the technologist from finding optimal solution. It's about constructive dialogue and balance. From both sides: how do you even know that there needs to be a conversation? How can we have a more meaningful conversation between intentions, specs, and product?" (Ex 2, 1c-D)
[102] "Think also about the wetware. Social groups. Periodical, predictable meetings have been done very well by a number of technical organizations (IEEE, SIGGRAPH, ACM); Emphasis on frequency and periodicity: you know when and where you can go to learn about projects." (Ex 7, 1c-A)

These in-person meetings must be augmented by an on-line environment where scholars and IT professionals can share their work in progress[103], solicit feedback and help[104], and get ideas for new projects[105], regardless of their physical location or travel budget.

### 1.3.4 Outreach to scholars about what is possible with digital tools and content

Some participants asserted that scholars who are unlikely to take up digital humanities practices themselves would benefit from a better understanding of the kind of scholarship enabled by digital tools and content[106]. It was suggested that "digital humanities evangelism" must be tailored to two different audiences: example-based how-to's for scholars who may be interested in making use of digital tools and content[107], and existing projects that "exemplify the intellectual value of digital scholarship"[108] for faculty who sit on tenure and review committees. Faculty events such as the TEI workshops run by Brown University might be a model for the former kind of "digital humanities evangelism". For purposes of exemplifying scholarship, scholars within a given field may wish to jointly identify projects that would particularly resonate within their community, regardless of the institution where it is being developed, and bring these to the attention of their colleagues.

### 1.3.5 Discoverability

The impact of digitized content and innovative tools is limited when scholars are unaware of their existence[109]. Project developers still resort to mailing lists and word-of-mouth for their "advertising", which may fail to reach potential users[110]. The lack of awareness of what tools are available has inevitably resulted in scholars spending time and money "reinventing the wheel", using time and funds that could be better directed towards innovation[111]. While there were some concerns about the sustainability of any

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[103] "Omniscient just-in-time just-enough info system, not just research info but for what people are doing" (Ex 6b, 1c-C)
[104] "Who has what skills that might help your project? Craigslist of specialized skills (unusual language skills, etc.)" (Ex 6b, 1d-C)
[105] "Clearing house / meeting place where those involved in Digital Humanities could share their work, find new collaborators, share ideas, and push for increased interoperability and expand fair use in the digital environment" (Ex 1, 1d-F)
[106] "Boost faculty awareness of tools, raising consciousness" (Ex 6b, 1d-F)
[107] "Expose faculty to models; create sustainable models; help faculty conceive projects using preexisting tools" (Ex 6b, 1d-F)
[108] Ex 6b, 1b-D
[109] "How do we find the good work done by others?" (Ex 1, 1d-H); "We don't know what is available" (Ex 1, 1d-D); "What about finding what's out there, or advertising what we've done? Discovery of tools, yes, a problem" (Ex 1, 1d-G)
[110] "question of advertising what you have and what you need. ex: curator digitizing a manuscript, needed an expert in ancient persian. how to find that person? their art librarian went to the right mailing list and luckily found someone, but might not have." (Ex 1, 1d-C)
[111] "Better sharing of information of projects we're already working on. A lot of us are reproducing each others efforts." (Ex 7, 1d-C)

directory that requires direct human involvement in its maintenance[112], such a directory appealed to a number of workshop participants[113], especially if it were to include scholar-generated reviews: "Establish a lookup/portal to find tools and services, [and] be part of a network of repositories of services internationally. Many tools are re-invented, and we would profit more by contributing internationally to a community of services... Not just a Google for tools, but also some sort of evaluation already done by scholars, technologists and information scientists."[114] Other participants felt that resolving issues of taxonomy interoperability would be a step towards addressing discoverability problems[115] in a more automated way.

### 1.3.6 KEEPING TRACK OF CONTRIBUTIONS AND THEIR IMPACT

The challenges relating to digital citation, credit, and peer review must be addressed in order for contribution to digital humanities scholarship to become more broadly accepted[116]. Participants expressed a desire to see a system that "keeps track of secondary contributions and lets you track the impact of your contributions (e.g. software, pedagogy, peer-reviewed journal article, etc."[117] This would need to be accompanied by a standard form of citation[118] that includes non-traditional forms of scholarship[119]. The success of any such system depends on wide adoption[120].

### 1.3.7 PARTICIPATION OF COMMERCIAL INDUSTRY

While many workshop attendees saw industry participation as an important source of funding and technology for digital humanities work[121], they also acknowledged that this would be, to some extent, uncharted territory for the humanities: "Linking with the outside world is something foreign to the humanities, when science tends to link to

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[112] "Critical thing with our tools is we evaluated them all, some someone is speaking to their efficacy. There needs to be some systematic survey of tools, need to be prepared to say why it exists and why something else does not. Efforts to do registries and lists become quickly boring unless you do the unkind thing of giving well-reasoned arguments for them." (Ex 7, 1c-A)

[113] "Let's not reinvent wheels, however, a directory would be a start" (Ex 7, 1b-B)

[114] Ex 7, 1c-B

[115] "'Middleware'; create a tool which brings existing tools to everyone on their own taxanomic terms. how do we apply that to "I'm a researcher; help!"" (Ex 1, 1d-C)

[116] "How do we assess the impact of grants, particularly in the technology area? Point to downloads, known adoptions, etc. But questions resurface again and again." (Ex 6b, 1d-A)

[117] "Some project like Bamboo for nanotech [Nanoweb]: it recognizes nontraditional contributions to scholarship; there is some system that keeps track of secondary contributions and lets you track the impact of your contributions (e.g. software, pedagogy, peer-reviewed journal article, etc.)" (Ex 1, 1b-B)

[118] "Better citation standards; Chains of credit in remixed data" (Ex 6b, 1a-G); "'every object need to be accessed would be represented in the open scholarly information universe to a persistent surrogate' -- this will transform citation, ubiquitous infrastructure and record keeping" (Ex 6b, 1d-E)" (Ex 6b, 1d-E)

[119] "When referencing materials online, it would be nice to know the right way to reference that material. Technologically easy, but not being done. What if we had a phone book of standard profiles of scholars." (Ex 6b, 1a-G)

[120] "issues of getting critical mass, and gathering up community." (Ex 7, 1a-H)

[121] "We will need the industry to participate; going between nonprofit and for-profit areas: that is scary" (Ex 1, 1b-B)

commercial realms more often... What are the processes coming from the outside world that can welcome the humanities? How does industry respond to the humanities?"[122] Negotiating with industry collectively – such as HathiTrust has done – may prove more successful than individual institutions attempting to forge their own agreements.

### 1.3.8 Building consensus and service frameworks to enable collaboration

Workshop participants placed a high value on the heterogeneity of scholarly practice in the humanities, but acknowledged that collaboration requires a shared service framework[123]. It was noted that not all of the variation in practice was deliberate, but rather, caused by a lack of awareness of currently-used standards[124]. The extent to which tools and data currently fail to interoperate frequently arose as a topic of great concern[125]. Participants noted that having all parties agree ahead of time on standard usage is not a prerequisite for beginning collaborative work: "If there's some good reason for people to come together, standards will emerge."[126]

## 1.4 Summary

Scholarly practice is evolving in response to tools and content newly available to humanists. Scholars are foraging in new environments, and by necessity depending on effective automated synthesizing and filtering to pare down search results. The increase in digitization combined with new tools for visualization has allowed scholars to access and analyze materials in new ways. Some aspects of the scholarly workflow are becoming more collaborative, with non-traditional partners including students and amateurs. The dissemination and publication model for the humanities is changing more slowly. A scholar who works on digital projects or shares her work on-line must also publish a sufficient number of printed articles or monographs to avoid jeopardizing her chances of renewal and tenure. There are still few incentives for writing the documentation that will be immensely valuable for future scholars, or for making one's data available for mashups and remixing. A resolution of these issues must combine new technologies with cultural changes from within the Academy.

Some of these changes – including library archiving policies and how to evaluate non-traditional forms of scholarship as part of the tenure process – must happen within each individual institution. Yet, there are other potential areas of work where partnerships

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[122] Ex 3, 1c-B
[123] "Highly heterogeneous; Cannot come up with a convergence because of variances. Need a common means for incubating these different approaches." (Ex 5, 1c-A)
[124] "For dissertation, I did a shadow database, didn't know TEI existed, I invented my own markup scheme and went on to do it" (Ex 5, 1c-D)
[125] "Focus on how one gets tools to work together. Interrelation/integration/interoperability of all tools. Workshop has identified this as a major problem, so it must be addressed. Interoperability of not only tools, but data sets.." (Ex 7, 1c-B); "transition assistance: refactoring, retrofitting, rehosting of datasets or processes to de-silo them." (Ex 7, 1d-E); "access to resources requires interoperability" (Ex 1, 1d-F)
[126] Ex 7, 1c-C

between institutions would be helpful – if not critical – for a successful outcome. Shared technology services could empower scholars at smaller institutions by giving them access to tools that do not rely on limited local resources. Successful models for encouraging partnerships of equals between scholars and IT professionals could be shared across institutions. "Digital humanities evangelism" and forums for sharing ideas and solutions could develop within disciplines and professional societies made up of scholars from multiple institutions. When seeking resources and funds from commercial industry, institutions may benefit from acting collectively, rather than forging individual agreements. There are other issues shared by humanities scholars – including tools and data that fail to interoperate, questions of how to cite, track, and give credit for materials published on-line, and how to find out about tools and resources that have already been developed – where any successful, sustainable solution requires widespread adoption. This trend towards inter-institutional cooperation, and the challenges and opportunities that come with it, will have ramifications for the development of scholarly practice in coming decades.

## 1.5 REFERENCES

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