# Redesigning Scholarly Communications Workflows and Work Habits for the Digital Age: The Greenhouse Studios Proposal

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**Abstract**

Greenhouse Studios | Scholarly Communications Design at UConn is a shared venture of the School of Fine Arts, UConn Library, and the College of Liberal Arts and Sciences at the University of Connecticut. Backed by long-term university investments of staff and space, Greenhouse Studios aims to institute on its university's campus, and share with others involved in academic publishing, a workflow and work culture suited to the creation of multimodal scholarly communications. This paper summarizes the research, undertaken with support from the Andrew W. Mellon Foundation, that informed the development of a design-based, inquiry-driven, collaboration-first model of scholarly production that places continuous, close, equitable scholarly communications labour at the heart of its mission. The model draws together divided workflows and flattens counterproductive hierarchies that, as vestiges of print-only traditions, impede fuller realization of the possibilities offered by the diverse range of digital and hybrid forms that increasingly define the publishing landscape.

**Keywords**

scholarly communications, digital technology, academic collaboration, multimedia projects

**Note to editors:** The unit's full name, Greenhouse Studios | Scholarly Communications Design at UConn, is properly rendered using ASCII printable character symbol 124 ( | ) between the words "Studios" and "Scholarly." Thank you.

In February 2017 Greenhouse Studios | Scholarly Communications Design at the University of Connecticut (UConn) opened its doors to test a hypothesis, which the team had researched and refined over the course of 2016 with a planning grant from the Andrew W. Mellon Foundation. The hypothesis, simply stated, holds that reform of scholarly publishing for a digital age requires more than new tools; it also calls for new, deeply collaborative, interdisciplinary workflows suited to the proliferated modes of expression, shared authority, dissemination, interaction, and reception now possible. Following is a summary of the research that shaped this hypothesis and gave form to the design-based, inquiry-driven, collaboration-first model of scholarly production that Greenhouse Studios is now testing and refining.[1]

**Tackling the Interlinked Problems of the "Information Chain" Model of Production**

Even as scholarly communication seizes opportunities presented by digital technology, its routine operations remain anchored in print-centric regimens. Given the academy's long-standing configuration around the production of physical texts, it is no surprise that print-like digital products, such as eBooks and online journals, have led the transition from ink to pixels. These developments were neither foregone nor frictionless outcomes for the various stakeholders involved. Nonetheless, they represented a path of least resistance by being the most readily actionable options in the academy's deeply rooted 'information chain' model of knowledge dissemination.[2] Simply put, the chain of scholarship begins with a knowledge creator, passes

through to a publisher, and culminates with accessibility secured by libraries and use by readers. Communications between these actors occurs mainly, if not only, at the points of 'handoff.'[3] This model, to be sure, is already undergoing structural changes due to economic pressures and the advent of digital technologies.[4] These changes, and the pressures to change, have affected publishers, libraries, and scholars alike.

University presses face some of the most intractable obstacles to supporting digital scholarship. Nowadays, as an editor at MIT Press told us, print-centric workflows are also expected to produce a digital product at the end, either as *the* final publication or as part of a print-digital hybrid.[5] Fulfilling these compounded expectations is further complicated by such recurring issues as the lack of capital needed to develop appropriate technology infrastructure and the more 'tradition-bound' attitudes that stifle support for experimentation at some institutions.[6] Another issue, particularly when there is no clear path to return on investment, is how deeply involved a press should be in the production of digital publications. As each publisher strikes upon the answers best fitted to its mission and resources, authors find themselves unsure of where to go for assistance. For example, Stanford University Press reported that the most common question it receives from authors of digital projects concerns technical development. As acquisitions editor Friederike Sundaram notes, they want to know, 'do we have developers that can build the platforms authors need to present their arguments? The answer is, we don't. … [A]nd we as academic publishers should not create [digital communication] but rather edit, produce, and market it.'[7] While Sundaram and others point to 'the impressive efforts underway at academic libraries around the country [that] show that other players on the academic field are already there to assist authors,' libraries also face obstacles to change.

Among these obstacles at academic libraries are administrative structures and organizational roles built around collections management and reference services, not the engaged production of new scholarship and its digital manifestations.[8] Libraries must also contend with the dual pressures of financially maintaining digital subscription licensing agreements and preserving the digital outputs of faculty research.[9] As Cliff Lynch has written, 'stewardship is easy and inexpensive to claim; it is expensive and difficult to honor.'[10]

For their part, humanities faculty desirous of having broad peer or public constituencies connect with their scholarship must acknowledge that, in an age of shrinking print runs and declining library purchases of specialized titles, achieving visibility and impact can be a challenge.[11] And yet, those same faculty who may be interested in new modes of publication face the inflexibility of promotion, tenure, and reappointment (PTR) guidelines, which, in most departments in the humanities at research institutions, continue to favor the traditional printed monograph over other forms of scholarly work as a singular marker of achievement.[12] With PTR assessment reported as 'a primary concern of faculty,' the likelihood that a printed book will carry greater weight with a scholar's review committee strongly discourages all but the tenured from experimentation with alternative expressive forms. As an important step toward change, a few key professional associations have issued PTR recommendations supportive of digital publication.[13] Their influence and adoption, however, remain uneven.

The problem of trying to support new products with old workflows is implicated in each of these sticking points and attendant tensions. For those working to evolve scholarly communications in the Internet age, there is a compelling need to productively disrupt and reconfigure the workflows and work cultures that have naturalized around the production of printed products.[14] Informed by our field research and literature review, the Greenhouse Studios

team recognized that effecting meaningful, sustainable change to the work culture required us to confront two entrenched tendencies: 1) the divided workflows that have solidified around the printed monograph and 2) the counterproductive hierarchies that subordinate some kinds of academic labour and activity to others. It is precisely these complex, systemic issues that Greenhouse Studios | Scholarly Communications Design at UConn aims to address with a novel design-based, inquiry-driven, collaboration-first model of scholarly production.

**Drawing Divided Workflows Together**

Despite the changing ecosystem briefly sketched here, the basic premises of the information chain model of scholarly communications have remained intact. For while the introduction of digital tools across the 'chain' has altered activities from research and writing on through to preservation and reading, it has not reconfigured the larger workflow in which the various actors remain interlinked but largely independent save for key transactional, or handoff, moments. This transactional model has contributed to the persistence of an increasingly detrimental division of activities into those of knowledge creation, or the domain side, and those of production, or the build side.[15]

This division is more than conceptual. It is reflected, for example, in humanities workspaces, funding, and interactions. The architecture of humanities scholarship—departmental floors or buildings with long hallways of private offices—create spaces where the best opportunities for collaboration are offered by the hallways themselves.[16] The predominant model of funding humanities work, the fellowship, is likewise conceived around the need for sequestered work. The very purpose of some fellowships is to remove the scholar from her students and colleagues for an extended period of time.[17] Humanities research is, in the wry

words of one colleague, 'inherently antisocial.'[18] To be sure, academic libraries have led the charge when it comes to re-envisioning the physical spaces of scholarship, as is evinced by their expansion beyond the study-carrel paradigm of research and work. These developments offer a more neutral, non-departmental 'third space' conducive to interdisciplinary collaborations.[19] Yet, with print-centric, siloed ways of working as the humanities norm, the number of faculty who see and access the productive potential of such spaces will likely remain small.

Even when an author is engaged in producing a work of digital or other non-traditional scholarship, the handoff habit is so well ingrained—and the work of the build side so well black-boxed—that many faculty remain isolated from developers, designers, editors, librarians, and other experts until after pertinent decisions about such things as appropriate software packages and metadata schemas have already been foreclosed.[20] So long as the workflows of those involved in scholarly communications remain divided, and their labour and work processes mutually invisible, new varieties of long-form multimodal scholarship will continue to have difficulty entering the ecosystem of peer review, publication, citation, and credit.[21]

**Flattening Counterproductive Hierarchies**

The issues presented by print-focused workflows are manifest in, entwined with, and exacerbated by frictions within academic labour hierarchies. The emphasis on transactional relationships and the naturalization of the domain/build divide reify existing frameworks that give visibility to some forms of academic labour while misrecognizing or discounting other kinds of academic labour.[22] The most common form of this uneven power relationship is between faculty and librarians, but it also exists, for example, within the library between credentialed librarians and

technical staff, between tenure-track faculty and non-tenure-track faculty, between editors and authors, and between faculty and students.

Additionally, supposed 'doing' activities (e.g., programming, design, database development, metadata management, etc.) are often cast as separate from and subordinate to 'thinking' activities (e.g., research, analysis, synthesis, writing). Even in the realm of digital scholarship, where collaborative undertakings are more the norm, early and vigorous debates pitted yack against hack, theory against practice, and scholarship against service.[23] Now, digital humanists roundly acknowledge that the binaries structuring much of the conversation did not present an accurate picture, although, at the time, they usefully raised the visibility of the contributions of technical labour. Today's digital humanities community recognizes that hacking involves yacking and yacking involves hacking, but this consensus has not filtered out into academia more broadly. And, although digital humanists have recognized the corrosiveness of these binaries, a practical workflow to challenge and replace them is lacking.[24] Such scenarios are, perhaps, particularly frustrating for those who hold the recognized terminal degree in their field of expertise, have their own research agendas, and who may also be faculty members.

The traditional service-orientation of libraries further frames the perceptions of faculty who come seeking such units' expertise. Few of the inquiries received by a typical digital humanities librarian can be characterized as constituting research.[25] The needs of most faculty are readily addressed through training and standardized solutions for data storage, manipulation, and presentation. While such library-based and -led 'digital scholarship centers' are different in mission than department-based, faculty-led 'digital humanities centers,' practitioners in both settings continue to find it difficult to navigate entrenched expectations about their relationships to service and research.[26] Joan K. Lippincott and Diane Goldenberg-Hart observed that within

libraries 'a primary point of contention was referring to what centers offer as "services" rather than "partnerships," "expertise," or other terminology that did not suggest that the center staff was there to "serve."'[27] Of digital humanities centers, Diane Zorich reported that, although they 'do not define themselves as service organizations, a review of their offerings suggests that service plays a large role in their operations.'[28]

Faculty expectations are even more difficult to navigate when library digital scholarship units explicitly combine the research and service functions. A good example is the UConn Library's Scholars' Collaborative, which experienced the tensions that a dual research-service mission creates. The first incarnation of this research-service unit left some faculty confused about the level of 'service' on offer and questioning why some projects seemed to be 'picked' for more robust attention than others. Staff, too, experienced frustration. Some recipients of consultations and trainings prevailed on staff's goodwill with the result that supposedly time-limited duties morphed into larger commitments.[29] The experience of the Scholars' Collaborative demonstrated to us the need for complementary but fully separate research and service units as part of the proposed intervention. One unit is needed to deal with more routine inquiries that lend themselves obviously and easily to existing technological infrastructure and instructional assistance. Another unit is needed to support work that requires deeper and longer collaboration among faculty, librarians, developers, designers, and editors and, therefore, a flatter hierarchy among them.

With the two units addressing the needs of digital scholarship from different ends, their missions would meet somewhere in the middle. The first would be chiefly concerned with providing service at scale, although where useful and desirable, it would adapt the research unit's methods and processes to its work. The second unit would be primarily concerned with

undertaking original research and developing new modes of scholarly communications. By systematizing the processes of collaboration and production and by utilizing existing scholarly communications infrastructure and tools as appropriate (something its diverse teams of practitioners will be well positioned to assess), it would aim to scale these activities sufficiently to be sustainable for the long term.

## A Design-Based, Inquiry-Driven, Collaboration-First Process

Greenhouse Studios is this second kind of unit, one with an explicit research mission. So, it requires a purpose-tailored production model that equally values all stakeholders involved in producing scholarship; that flattens traditional academic hierarchies; that systematizes the collaborative production of multimodal scholarly communication; and that can complement existing service-based approaches. The key attributes of the model are that is design-based, inquiry-driven, and collaboration-first.

### *Design-Based*

Our approach is design-based in that it is informed, first, by co-author Scheinfeldt's work on One Week | One Tool, an experiment in collaborative rapid design and development techniques funded by the National Endowment for the Humanities in 2010 and 2013. On each occasion, a collection of scholars, students, programmers, designers, librarians, and administrators, who had not previously worked as a team, gathered to conceive, build, and launch an entirely new software tool for humanities scholarship *in one week*.[30] Design-based practices do not, in and of themselves, address the cultural or workflow issues we seek to address—and, in fact, have been critiqued on these grounds.[31] So, next came careful analysis of the various approaches that fall under this umbrella term, from those pioneered by Stanford

University's Hasso Plattner Institute of Design (a.k.a. the d.school) and the design firm IDEO to more recent adaptations employed in finance, film, museum exhibition, journalistic communication, education, and critical making in the digital humanities.[32] Field research, made possible by a 2015 Mellon planning grant, complemented this work.

The team completed some twenty-four site visits to and phone interviews with industry (e.g., Google+, Blue State Digital) and university libraries, presses, digital humanities centers, and engineering departments (e.g., Brown, Duke, Harvard, North Carolina State, Stanford, and Yale Universities and the University of North Carolina, Chapel Hill). University colleagues' frank assessments of obstacles to resources, staffing, collaboration, merit review, assessment, and sustainability proved essential in developing a production model and implementation plan that would proactively address common barriers to digital scholarship within academia.

Lastly, to tackle the issue of divided workflows, we elicited mental models of the scholarly communications process from individuals whose primary role in traditional collaborations was that of a project manager, scholar, designer, repository manager, developer, digital scholarship librarian, developmental editor, or graduate research assistant.[33] The points of harmony among these archetypes provided the framework for the Greenhouse Studios process, which is represented as five primary activity cycles—or 'sprints' (Figure 1). The aim is to achieve a workflow that feels native to team members from different domains; requires substantive, full-team collaboration for exploratory as well as decision-making stages; and avoids midstream handoffs, which the mental models showed us led to duplicated work and stymied creativity. We chose neutral descriptors for each cycle and its associated activities to achieve cross-disciplinary intelligibility and to eliminate the kinds of value judgements that domain-specific terms can inscribe.

### *Inquiry-Driven*

Identifying the need for an inquiry-driven component is best understood as a means to dislodge labour hierarchies. As a representation of reality, the information chain model is, of course, faulty; no scholarly project is undertaken or advanced in isolation. Even single-authored monographs engage colleagues, archivists, and acquisition editors in meaningful interdependence at the outset. Nonetheless, as prevailing metaphors for social relationships often do, the information chain model contributes both to the elision of contrary facts and to the production of consonant systems and behaviors.[34] Thus, a scholarly communications model that points to an individual researcher's pre-existing, personal undertaking as the initiating impetus for subsequent activity will continue to establish a hierarchy predicated on unequal ownership of *the idea* before collaboration commences. In contrast, the Greenhouse Studios design process starts with an inquiry-focused prompt—a question, challenge, problem, or provocation—around which a team of people is assembled. By starting with people and a prompt, the Greenhouse Studios design process recognizes and prioritizes collaborations and contributions that were always a vital, but rarely foregrounded, part of the scholarly communications workflow. Further, it creates a shared scholarly investment in the research effort.

### *Collaboration-First*

Similarly, emphasizing that the process is collaboration-first serves as a corrective to divided workflows (even digital-centric ones) where collaborators are brought on board to implement scholarly projects, not imagine them. Creative collaboration will be stymied unless the work process conduces to empower equally, and at the same time, all members of the team. The Greenhouse Studios model draws designers, project managers, students, developers, editors, publishers, and librarians together with humanities faculty to start new projects, not merely to

finish them. This better allows teams to anticipate and to tackle technical, peer-review, publishing, sustainability, and other challenges earlier and more effectively than if these things were left for the end of a project or for others to deal with. It also facilitates the flattening of traditional academic hierarchies by opening the opportunity for each collaborator to articulate and pursue at the outset—and as part of the larger project—her own research agenda. Empowering team members to define a personally meaningful outcome for their contributions fosters the possibility that the professional benefits derived from the project will be more equally available to all participants. This said, it remains incumbent on Greenhouse Studios' facilitating staff and collaborators to remain mindful that a core aspect of their work together is actively to institute a culture that resists ingrained hierarchies and strives to embrace all contributions (technical, domain-specific, administrative, etc.) equally.

[Insert Figure 1 about here.]

**The Greenhouse Studios Model**

The Greenhouse Studios design process begins with people and an inquiry-focused prompt. The The approach to identifying and fashioning topics for inquiry is collaborative, practical, and, in some ways, not unlike deciding what makes for a generative conference theme in terms of needing to strike a balance between focus and capaciousness. In addition our website's open invitation to "Suggest a New Prompt" by completing a simple form, topics inevitably arise in casual conversations with colleagues across and beyond the university. The nine-member steering committee, which includes Greenhouse Studios leadership and colleagues from the School of Fine Arts, College of Liberal Arts and Sciences, and the Uconn Library, also propose topics, some of which are related to available funding, alignment with campus initiatives, access to understudied collections, and other strategic consideration. The final choices come from committee discussion and debate. Each team, roughly speaking, has at least a librarian, faculty member, student, design technologist, editor, and project manager. Of these, the student, project manager, and design technologist are Greenhouse Studios staff. In addition to calling on UConn community members who have expressed interest in being on a team, we reach out proactively to people who have a track record of collaboration, who we know to be collegial, and who have a range of relevant skills. By experimenting with a variety of approaches to forming inquiry prompts and teams, we are learning what works.

When a project team is assembled around a prompt, the first phase of work—its first sprint—aims to ***understand*** its prompt, the human talents, other resources (collections, technologies, internal and external funding opportunities), and constraints (time, money, barriers to engaging desired audiences) at hand. It does this through a process of listening to and questioning one another and defining the project's terms and parameters. At the end of the *understand* sprint, the team will have produced a draft of a creative brief. This document outlines project aims and audiences, the basic research landscape in which it resides, team resources and constraints, what the ultimate product must do to answer the prompt, and what benchmarks might serve to measure its success in meeting the authors' aims. The creative brief does not suggest what form or media the project will take. Rather, it takes what had been an open-ended challenge and begins to narrow the range of responses the team may make to it. This creative brief will be revised, refined, and recirculated to team members in advance of the next sprint.

It is important to emphasize that the core team assembled at the start of this first sprint is meant to include potential publishing partners, who would be represented by a staff expert appropriate to that publisher's operations model (e.g., acquisitions editor, digital products manager). In addition to university presses, partners might include music labels, film production companies, electronic journals, and other publishers as appropriate to project content and objectives. Our planning-year discussions, primarily with university presses but with electronic journals, too, helped establish an initial base of potential collaborators upon which we will build. The decision to cultivate external press partners rather than establish our own library publishing unit as other related efforts have done is based on both local conditions and strategic priorities. First, UConn does not already have its own press, so there is no obvious local foundation upon which to build a library publishing effort, no existing UConn Press that we can 'bring into' the

library as, for example, the University of Michigan has done. Therefore we understood from the outset that external partnerships would be essential for Greenhouse Studios' mission to bring appropriately credentialed scholarly communications projects to academic and other markets. Yet, given the richly diverse foci of humanities inquiries and the range of multimodal communications forms, we see the lack of a press as an opportunity rather than a limitation; it opens the possibility of striking best-fit relationships driven by the needs of the scholarship as well as the interests of the publishing partner(s). Such an approach is consistent with the input received from university press representatives during our field research. They all communicated receptiveness to exploring new modes of scholarly communications and new publishing workflows. However, their openness to publishing the products of this scholarship was predicated on whether that work fell within their established content-area strengths. That is, publishers were enthusiastic about the Greenhouse Studios' vision and open to collaboration but only if the project in question fit their list. Therefore, because we plan to undertake projects across the disciplines, a variety of publishing partners is needed for our work. Our first is the University of Massachusetts Press, with whom we have particular mutual strengths in areas such as New England history, public history, U.S. history, and pedagogy. Discussions with other potential partners, including the University of North Carolina Press, University of Nebraska Press, Stanford University Press, Duke University Press, and the University of Minnesota Press are ongoing as new inquiry prompts are developed and teams assembled.

The second sprint, ***gather***, sees the team expand its thinking once again as it seeks out relevant sources, knowledge, and inspiration. The team meets at the beginning of this phase to think broadly and divergently about the possibilities of the project and to determine appropriate avenues for additional research in light of the goals and values set out in the creative brief. Team

members then go off on their own to collect additional materials. After a period of weeks, the team reconvenes to sort and synthesize its findings, to start thinking more concretely about the possible manifestations of the project and, ultimately, to produce a detailed functional specification for the project. This document will include a description of the media formats the team will employ. The functional spec also elaborates on the criteria for success suggested in the creative brief, outlines the plan by which the project will be delivered to its audiences, and articulates more formal peer-review and assessment plans for the work.

With the creative brief and functional spec in hand, the team is well positioned to pursue internal and external funding opportunities when desired. These documents also guide the team as it embarks on a roughly six-month period of iterative prototyping, testing, and refining of the work, with progress toward a final deliverable in mind. During this ***build*** phase of active implementation, team members convene weekly for a 'stand-up' meeting. (These regular, short convenings of all team members, where attendees literally stand, rather than settle in, are another core feature of the agile development methodology that enables teams to nimbly set and recalibrate priorities and design directions without drifting off task.)

The *build* phase wraps up when team members agree that the media manuscript is ready for ***review***. We chose the term 'media manuscript' to describe the project's status as it exits the *build* cycle because, no matter its form, it is a scholarly product that, though 'feature complete,' will next undergo peer review, editing, and revision. Depending on the project and the decisions laid out in the functional spec, *review* cycle activities may involve circulation to locally sourced peer reviewers in advance of additional pre-publication edits; cooperation with a publishing partner who may coordinate peer review, editing, marketing, and, in some cases, additional production; or, where the intended audience warrants, direct release for post-publication peer

review. This phase also calls for the team to reflect and engage in directed self-reflexive critique and assessment of the first four design phases. This major review—along with periodic stocktaking throughout the entire process—is key to folding our experiential learnings back into the iterative refinement of the design process itself and to formulating recommendations for future projects.

The design process concludes with ***release*** of the publication/s—and the longer-term work of dissemination, assessment, and preservation and access. Dissemination includes collaboration with our publishing partner(s) on marketing and direct outreach to audiences. Assessment will entail gathering early performance data based on the success criteria established in the project's *understand* and *gather* phases, performing an initial impact assessment, and reporting these results to stakeholders. Lastly, *release* phase activities will involve finalizing preparations made in earlier cycles and implementing the plans for technical sustainability, data curation, and preservation and access to the work, its underlying data, and any derivatives. Here, close and early collaboration with the university library's technical staff (e.g., the Digital Scholarship and Data Curation Unit) and their counterparts at our publishing partner(s) is key. Start to finish, from the initiation of collaboration-first research to early post-publication, we estimated the Greenhouse Studios' design process to be, on average, a two-year undertaking for long-form scholarship.

**Conclusion**

Supported by a second grant from the Andrew W. Mellon Foundation and expanded university commitments, we commenced testing this process and its underlying hypothesis in 2017. Our first three projects, which all address the inquiry prompt *The Limits of Text*, are approaching the

two-year mark. Insights from 'the making' of this first cohort allowed us to fine-tune the Greenhouse Studios design process for the second cohort of prompts and six projects that commenced in 2018.[35] Simultaneously, the team is also addressing such issues of shared concern as achieving 1) long-term sustainability for our interdisciplinary unit, 2) integration into and impact in PTR and merit review processes, and 3) partnerships with presses that enable the thoughtful use of existing as well as emerging digital publishing tools so that Greenhouse Studios' contributions both complement and extend the innovative work being done by colleagues elsewhere. We plan to share the findings from our two-year implementation phase as a follow-up to this report.

**Biographical Notes**

Clarissa Ceglio, PhD, is Associate Director of Research for Greenhouse Studios, where she brings to bear editorial experience in the arts and history fields. She is an Assistant Professor in UConn's Department of Digital Media & Design, working at the intersections of digital humanities, museum studies, and public history.

Tom Scheinfeldt, DPhil, is Director of Greenhouse Studios. He is Associate Professor of Digital Humanities at the University of Connecticut, where he holds a joint appointment in the Department of Digital Media & Design and the Department of History.

Sara Sikes joined the UConn Library in 2016 as the Associate Director of Greenhouse Studios. She holds an MA in American studies from the University of Maine and is currently pursuing an

MLIS at Simmons College. Her career includes positions in museums, academic publishing, and public history institutions.

Figure 1. The team, in collaborative response to an inquiry-focused prompt, undertakes a four-phase (understand, gather, build, and review) design process. Each phase involves its own activity subset that leads to the completion of an interim and, in the last case, a final product (creative brief, functional spec, media manuscript, and publication-ready project/s, respectively). The allied fifth phase, release, denotes post-publication activities. Diagram by Samantha Olschan, MFA.

**Notes**

[1] Members of Greenhouse Studios' first steering committee indispensable to this work are UConn Library's Greg Colati and Michael Howser; Alexis Boylan, Anke Finger, and Brendan Kane of UConn's Humanities Institute / College of Liberal Arts and Sciences; and Samantha Olschan of the School of Fine Arts.

[2] On uses and the persistence of this model, see John Mackenzie Owen, 'The New Dissemination of Knowledge: Digital Libraries and Institutional Roles in Scholarly Publishing,' *Journal of Economic Methodology* 9, no. 3 (2002): 275–88.

[3] 'Supporting the Digital Humanities: Report of a CNI Executive Roundtable,' Coalition for Networked Information, May 2016, 3, https://www.cni.org/wp-content/uploads/2016/05/CNI-SupportDH-exec-rndtbl.report.F14.pdf.

[4] Owen, 'New Dissemination of Knowledge,' 276. For a conceptualization of the information chain as a circular loop involving reader-researchers, see Oya Y. Rieger, 'Framing Digital

Humanities: The Role of New Media in Humanities Scholarship,' *First Monday* 15, no. 10 (2010), http://firstmonday.org/ojs/index.php/fm/article/view/3198.

[5] Anna Pollock-Nelson, manager of digital products, Digital Products Department, MIT Press, phone interview with the authors, July 21, 2016.

[6] Laura Brown, Rebecca Griffiths, and Matthew Rascoff, 'University Publishing in a Digital Age,' *Journal of Electronic Publishing* 10, no. 3 (2007), doi:10.3998/3336451.0010.301.

[7] Friederike Sundaram, 'Publishing Digital Scholarship,' Council on Library and Information Resources, Digital Library Federation, blog, March 21, 2016, http://connect.clir.org/blogs/friederike-sundaram/2016/03/21/publishing-digital-scholarship.

[8] In contrast to Sundaram's assessment, a 2016 survey of academic librarians reported that 'the role of libraries in digital scholarship remains unclear' and that 'nine out of ten librarians indicated that their library does not [even] have a written statement describing [its] support for digital scholarship.' See summary and embedded links in Stewart Varner and Patricia Hswe, 'Special Report: Digital Humanities in Libraries,' *American Libraries Magazine*, January 4, 2016, http://americanlibrariesmagazine.org/2016/01/04/special-report-digital-humanities-libraries/.

[9] Rowland Lorimer, 'Digital Developments in Libraries, Journals, and Monograph Publishing: Emerging Pitfalls, Practices, and Possibilities,' *Scholarly and Research Communication* 4, no. 1 (2012): 2, http://src-online.ca/index.php/src/article/view/43; and Deanna Marcum, 'Office of Scholarly Communication: Scope, Organizational Placement, and Planning in Ten Research Libraries,' Ithaka S+R, 2016, 15–16, http://www.sr.ithaka.org/publications/office-of-scholarly-communication/.

[10] Clifford A. Lynch, 'Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age,' *Libraries and the Academy* 3, no. 2 (2003), 330–31, 334.

[11] See Craig Lambert, 'The "Wild West" of Academic Publishing,' *Harvard Magazine*, February 2015, http://harvardmagazine.com/2015/01/the-wild-west-of-academic-publishing.

[12] Donald J. Waters, 'Monograph Publishing in the Digital Age: A View from the Mellon Foundation,' *Against the Grain* 28, no. 3 (2016): 18.

[13] College Art Association and the Society of Architectural Historians, 'Guidelines for the Evaluation of Digital Scholarship in Art and Architectural History,' January 2016, http://www.collegeart.org/pdf/evaluating-digital-scholarship-in-art-and-architectural-history.pdf; American Historical Association, 'Guidelines for the Evaluation of Digital Scholarship in History,' June 2015, https://www.historians.org/teaching-and-learning/digital-history-resources/evaluation-of-digital-scholarship-in-history/guidelines-for-the-evaluation-of-digital-scholarship-in-history; and Modern Language Association Committee on Information Technology, 'Guidelines for Evaluating Work in Digital Humanities and Digital Media,' February 2012, https://www.mla.org/About-Us/Governance/Committees/Committee-Listings/Professional-Issues/Committee-on-Information-Technology/Guidelines-for-Evaluating-Work-in-Digital-Humanities-and-Digital-Media.

[14] On *long-form scholarship* as a synonymous but more elastic term for monograph, see Michael Elliott, 'The Future of the Monograph in the Digital Era: A Report to the Andrew W. Mellon Foundation,' *Journal of Electronic Publishing* 18, no. 4 (2015), http://quod.lib.umich.edu/j/jep/3336451.0018.407?view=text;rgn=main. Like Elliott and others, we take both terms to mean 'a peer reviewed, detailed written work on a single specialized

subject, whose presentation of evidence, argument, and conclusions do not fit within the constraints of an academic journal publication.'

[15] Joshua Sosin, associate professor, Department of Classical Studies and director of the Duke Collaboratory for Classics Computing, Duke University, interview with the authors, June 29, 2016.

[16] As a counterbalance, digital humanities centers have frequently taken the 'lab' as their conceptual framework and namesake. Among the best known examples of this are the former Stanford Humanities Lab (reconfigured as Stanford University's Center for Spatial and Textual Analysis), Yale University Library's Digital Humanities Laboratory, and the MIT Media Lab. On this topic, see Amy Earhart, 'The Digital Humanities as a Laboratory,' in *Humanities and the Digital*, edited by David Theo Goldberg and Patrick Svensson (Cambridge, MA: MIT Press, 2015), 391–400.

[17] It is important to recognize, however, that this is not universally true. Many research institutes, for example, independent libraries and archives, take measures to ensure that there is, indeed, fellowship during an individual's or cohort's in-residence experience. Lunches, informal talks, and other gatherings are designed to foster robust and serendipitous exchange among fellows and institute staff members.

[18] Robert C. Allen, director and co-founder, Digital Innovation Lab, University of North Carolina at Chapel Hill, interview with the authors, June 29, 2016.

[19] 'Supporting the Digital Humanities: Report of a CNI Executive Roundtable,' 4; Ray Oldenburg, *The Great Good Place: Cafés, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts, and How They Get You through the Day* (New York: Paragon House, 1989).

[20] Black-boxing, as articulated by Bruno Latour in *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1988) and *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), describes the ways in which successful outcomes render the mechanisms by which they occur opaque or invisible over time, allowing them to function as unquestioned common sense. The digital processes of the 'build side' are, of course, newer than those of print production, but it is their very unfamiliarity coupled with the mystique of specialist technological knowledge that serves to black-box in this case. On recognizing the importance of making the process of producing digital scholarship visible in order to adequately preserve and access it, see Lorcan Dempsey, 'The Facilitated Collection,' *Lorcan Dempsey's Weblog*, January 31, 2016, http://orweblog.oclc.org/towards-the-facilitated-collection/.

[21] It is no accident that much of the digital scholarship that meets these criteria has emerged not from scholars working alone and bringing their projects to digital service units within, for example, university libraries but from dedicated digital humanities centers where projects are conceived collaboratively. One can look, for example, at the role of the Center for Spatial and Textual Analysis at Stanford University and the role of its Spatial History Project in creating *Enchanting the Desert*, the first born-digital monograph published by Stanford University Press. Nicholas Bauch, *Enchanting the Desert: A Pattern Language for the Production of Space* (Stanford, CA: Stanford University Press, 2016), http://www.enchantingthedesert.com/home/.

[22] On work-culture resistance to change, see Joe C. Magee and Adam D. Galinsky, 'Social Hierarchy: The Self-Reinforcing Nature of Power and Status,' *Academy of Management Annals* 2, no. 1 (2008): 351–98. Yet, as the authors note, the mechanisms that sustain the status quo can also be redirected to support change.

[23] Bethany Nowviskie, 'On the Origin of "Hack" and "Yack,"' in *Debates in the Digital Humanities 2016*, ed. Matthew K. Gold and Lauren F. Klein (Minneapolis: University of Minnesota Press, 2016), http://dhdebates.gc.cuny.edu/debates/text/58; Adeline Koh, 'More Hack, Less Yack? Modularity, Theory, and Habitus in the Digital Humanities,' *Adeline Koh: Writer. Teacher. Builder. Entrepreneur*, May 21, 2012; and Jean Bauer, 'Who You Calling Untheoretical?' *Journal of Digital Humanities* 1, no. 1 (2011), http://journalofdigitalhumanities.org/1-1/who-you-calling-untheoretical-by-jean-bauer/.

[24] Even in digital humanities centers, where such hierarchies are less pronounced, leadership is more likely seen as the project idea generators, with staff, students, etc., primarily in implementation roles.

[25] For example, Stewart Varner told us that the inquiries he receives follow a Pareto distribution in which only roughly 20 per cent constitute anything beyond a simple service solution. Stewart Varner, digital scholarship librarian, Research and Instructional Services, Davis Library, University of North Carolina at Chapel Hill, interview with the authors, June 29, 2016.

[26] Joan K. Lippincott and Diane Goldenberg-Hart, *CNI Workshop Report. Digital Scholarship Centers: Trends & Good Practice* (Washington, DC: Coalition for Networked Information, December 2014), https://www.cni.org/wp-content/uploads/2014/11/CNI-Digitial-Schol.-Centers-report-2014.web_.pdf.

[27] Ibid.

[28] Diane M. Zorich, *A Survey of Digital Humanities Centers in the United States* (Washington, DC: Council on Library and Information Resources, November 2008), 19, https://www.clir.org/pubs/reports/pub143/pub143.pdf.

[29] Greenhouse Studios advisory board member Bethany Nowviskie of the Digital Library Federation has repeatedly decried the impoverished outcomes produced when the relationship of librarians and other skilled practitioners to digital scholarship is conceived of in terms of service as opposed to organic collaboration. See 'A Skunk in the Library,' *Bethany Nowviskie*, June 28, 2011, http://nowviskie.org/2011/a-skunk-in-the-library/.

[30] As the outcomes of One Week | One Tool, both 2010's *Anthologize* (http://anthologize.org, a WordPress plug-in designed to facilitate the remix and republication of blog posts as books) and 2013's *Serendip-o-matic* (http://serendipomatic.org, a specialized search engine designed to approximate for Web users the experience of serendipitous discovery in physical archives) have found enthusiastic audiences and are used daily by many scholars and others around the world. As of 30 July 2018, the WordPress plug-ins directory lists current downloads of *Anthologize* at 65,472 and 'active installs' at '1000+' (see https://wordpress.org/plugins/anthologize/stats/). See also Alexis C. Madrigal, 'Academics Build Blog-to-eBook Publishing Tool in One Week,' *The Atlantic*, August 3, 2010, http://bit.ly/yiZ0lj. *Serendip-o-matic.org* has won multiple awards, including a 2013 Digital Humanities Award for 'Best Use of DH for Fun.' (http://dhawards.org/dhawards2013/results/) and the *Charleston Advisor*'s Readers' Choice Award in 2014 (http://dx.doi.org/10.5260/chara.16.2.3a).

[31] The issues include reifying a thinking/doing dualism and privileging designers as the main agents; see Lucy Kimball, 'Rethinking Design Thinking: Part I,' *Design and Culture* 3, no. 2 (2011), 285–306.

[32] For a short history of design thinking, see Peter N. Miller, 'Is "Design Thinking" the New Liberal Arts?,' *Chronicle Review* 61, no. 29 (March 26, 2015), http://chronicle.com/article/Is-Design-Thinking-the-New/228779/. Richard Buchanan traces a longer lineage in 'Wicked

Problems in Design Thinking,' *Design Issues* 8, no. 2 (1992): 5–21. Diverse applications of design thinking include Suzanne MacLeod, Jocelyn Dodd, and Tom Duncan, 'New Museum Design Cultures: Harnessing the Potential of Design and "Design Thinking" in Museums,' *Museum Management and Curatorship* 30, no. 4 (2015): 1–28; Juliette Melton, 'How We Used Design Research to Launch *The New York Times En Español*,' *Medium* (February 9, 2016), https://medium.com/@j/how-we-used-design-research-to-launch-the-new-york-times-en-espa%C3%B1ol-ae23c5c3001a#.farzbrq7a; and Anne Burdick, 'Meta! Meta! Meta! A Speculative Design Brief for the Digital Humanities,' *Visible Language* 49, no. 3 (2015), http://visiblelanguagejournal.com/issue/172/article/1162.

[33] Robin S. Grenier and Dana Dudzinska-Przesmitzki, 'A Conceptual Model for Eliciting Mental Models Using a Composite Methodology,' *Human Resource Development Review* 14, no. 2 (2015), 163–84. The authors describe mental models as akin to individual maps that are 'formed through experience, observation, and learning, [which] are used in decision making to understand, predict, and solve problems' (163).

[34] Loizos Heracleous and Claus D. Jacobs, 'Understanding Organizations through Embodied Metaphors,' *Organization Studies* 29, no. 1 (2008), 45–78; Kathy E. Kram, Ilene C. Wasserman, and Jeffrey Yip, 'Metaphors of Identity and Professional Practice: Learning from the Scholar–Practitioner,' *Journal of Applied Behavioral Science* 48, no. 3 (2012), 304–31.

[35] For details on Greenhouse Studios projects and prompts, click the respective tabs on our website home page, https://greenhousestudios.uconn.edu/.