Building a Scholarly Multimedia Publishing Infrastructure

Cheryl E. Ball

This article provides a preview of Vega, a new scholarly publishing platform in development (set to be released in late 2017). With twenty-plus years of experience publishing scholarly multimedia in the journal Kairos, *the author summarizes editorial practices for multimedia content in terms of the scholarly, social, and technical infrastructures required to sustain digital media-rich publishing venues. Vega is an outgrowth of those practices that aims to provide a stable platform for training editors, publishers, and authors in how to create, edit, and maintain the scholarly record.*

Keywords: scholarly multimedia, webtexts, digital publishing, digital media, ~~ere-search~~, editorial management systems

INTRODUCTION: SCHOLARLY MULTIMEDIA ISN'T NEW

Despite recent public relations campaigns suggesting that some scholarly multimedia journals are offering brand new, 'pioneering,' and 'first' efforts in the digital publishing landscape,[1] scholarly publishing of digital media-rich content dates back to before we could call it multimedia or even Web-based publishing—indeed, to days when we still had to label such content 'hypermedia' or just plain 'hypertext.' In the pages of this journal, when it went by the name *Scholarly Publishing*, discussions of hypermedia date back to at least 1990, when Gregory Crane published '"Hypermedia" and Scholarly Publishing' (discussing the Perseus Project, a hyperlinked database of Greek texts and images that started in the Internet's pre-Web days).[2] These 'first' campaigns attempt to capitalize on the *kairos*—the rhetorically opportune and timely moment—that scholars and publishers have found themselves in: at the crossroads of easily available, professional-grade production technologies for digital media; feasible technological implementation of online journals; and the exciting hype of digital culture. I give all credit where credit is due to publishers (of any variety: commercial or independent or somewhere

in between, such as scholarly associations) who have jumped on the scholarly multimedia bandwagon. But what I also know is that most of these ventures will fail.

There are multiple dozens of online scholarly journals that now publish some, if not all, of their content in multimedia format. As editor of the longest continuously running scholarly multimedia journal—*Kairos: A Journal of Rhetoric, Technology, and Pedagogy* (http://kairos.technorhetoric. net), as of this writing now in its twentieth year of publication—I welcome more compatriots! So, when I say above that most of these new ventures will fail, I say it with sadness. Academia needs more publishing venues that allow authors to construct scholarly and creative texts in media appropriate to their thoughts and arguments. But it is not as easy as the 'publish' button of an online tool such as WordPress suggests, although many editors and (especially independent) publishers assume that it is. Space precludes me from detailing all of the ways publishing multimedia content is different from publishing print-like content, but I have discussed these in other works I've written:

- why and when scholarly multimedia journals fail;[3]
- what scholarly, social, and technical infrastructures these journals need in order to succeed;[4]
- which disciplines might best allow such journals to proliferate;[5]
- how peer-review expectations change for webtexts, without a loss of rigor;[6]
- how authorial revision requires editorial feedback on macro and micro rhetorical and technical levels;[7]
- how editorial and production workflows have to change to accommodate multimedia.[8]

I have also written numerous pieces that offer close rhetorical analyses and evaluative assessment practices for the multimedia components in a scholarly webtext.[9] That is to say, I've spent most of the last two decades studying the rhetorical composition, delivery, and reception of webtexts and have helped a handful of digital journals and presses reorient their traditional print-oriented publishing mind-set toward effective webtextual publication.

However, an issue that has plagued the successful and sustainable adoption of scholarly multimedia publishing is the lack of technical infrastructures, particularly for journals in the humanities, arts, and social

sciences. The majority of scientific journals that provide multimedia components as part of their publishing platforms are large corporate monoliths such as Elsevier, with their 'article plus' features — essentially print-like articles that include embedded video or interactive graphics. This is progress of a sort when it comes to multimedia authoring and publishing. But, given my own professional interest in and moral obligation to open access publishing[10] and the fact that nearly all of the known successful online journals that publish webtexts are open access of the *libre* variety (i.e., no fees for authors, no fees for readers; totally free to anyone at any time), I am inclined to be less interested in the success of major publishing conglomerates than I am in finding and creating sustainable technical infrastructures for independent, non-profit, and other small-scale publishers regardless of their disciplinary inclination. Thus, in this article, I focus on how *Kairos* has functioned as an experimental test bed for scalable infrastructures that turned into Vega, a platform for publishing sustainable scholarly multimedia funded by the Andrew W. Mellon Foundation.

WHENCE *KAIROS* CAME

Concomitant with the introduction of the World Wide Web in the mid-1990s, *Kairos* began publishing in 1996 after a group of graduate students from several PhD programs in rhetoric, composition, and technical communication — collectively referred to here as writing studies — decided there should be a scholarly venue that practiced the hypertextual theories preached by writing studies and related fields (e.g., postmodern literary studies and electronic literature). These webtexts purposefully merged form and content so that authors could make scholarly meaning not only from written text but also from hyperlinks, embedded and linked media (starting with very basic digital images, such as gifs), and webtext interfaces that authors designed themselves. The sub-discipline of *digital* writing studies — comprising scholars who research and teach academic and professional writing practices with, in, and through digital technologies — quickly embraced this experimental form of scholarship.

Kairos is and has always been online, independently published, peer reviewed, and completely free to access for authors and readers. Based on server logs, we know that *Kairos* is read in over 180 countries and has had over 50,000 unique readers during publication-release months. It currently has a 10 to 15 per cent acceptance rate for its peer-reviewed

sections, having grown more rigorous in the second decade of its existence due to its rising prominence in the field and implementation of training practices for the production staff. The staff are volunteers,[11] and server space has, until very recently, been donated by English departments that were somehow affiliated with a senior staff member. Based on the feminist pedagogical and social justice principles of the writing studies community, *Kairos* has always been a collaborative labour of love with a no-money-in/no-money-out business plan. This meant, from the very beginning of the journal, that we needed to use whatever technologies we could get for free to make the journal run. We adopted free listserv software for staff communication and used file transfer protocol (FTP) programs alongside whatever Web-editing software our staff could get hold of, either for free or as part of their employment packages at universities.

Twenty years into the running of *Kairos*, our editorial workflow is still built primarily on the digital technologies we adopted in the first few years of publishing (1996–8) because the non-proprietary and ubiquitous systems allowed us to maintain our independence while still publishing timely and rigorous scholarship. However, the digital writing studies community is unusual among humanities disciplines in that its scholars know how to use digital technologies to publish journals like *Kairos*. Part of this field's research includes understanding and implementing digital literacy practices such as Web design and multimedia production. Indeed, in the history of webtextual and scholarly multimedia publishing, digital writing studies has the most journals of this kind—as many as a dozen have existed in the twenty-plus years since the Web started, which is a *lot* for a discipline that currently may only have about 1000 scholars in the United States.[12]

Although *Kairos* was not the first journal to implement such scholarly forms, it has been the only one inside or outside its discipline to publish continuously and to last as long as it has. One of the major reasons for its continuance is its reliance on the old-school digital technologies mentioned above. These technologies don't make the editorial workflows easy for the staff, but the lack of money, alongside the lack of platforms that can sustainably host webtexts, has prohibited *Kairos* from changing the way it works. For instance, *Kairos* began publishing long before there were usable content management systems (CMSs) like Drupal, Sharepoint, and WordPress, which have easy upload options for files. Instead,
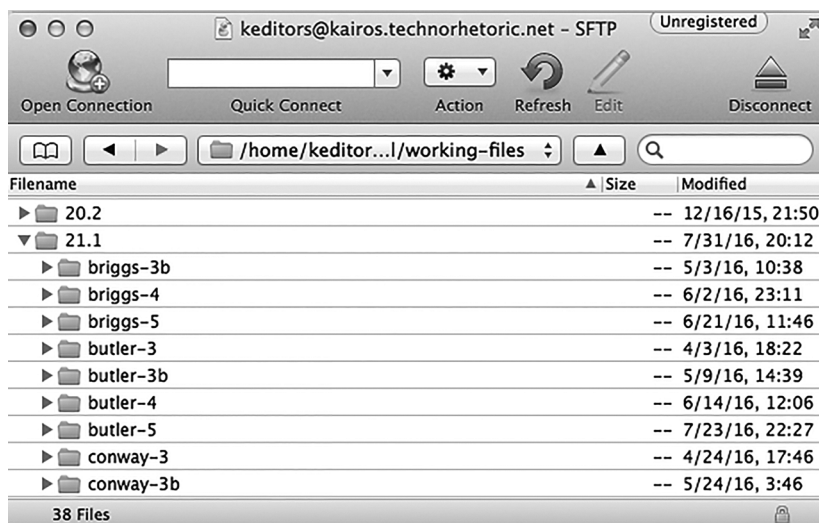
FIGURE 1. Screenshot from the *Kairos* production server, showing the multiple versions of webtexts for a single issue, as they rotate through copy-editing (via Cyberduck, a shareware FTP program used to move files and folders between servers and computers)
Cyberduck © 2002–16 David V. Kocher; © 2011–16 Yves Langisch; published under the GNU General Public License

Kairos staffers use stand-alone (e.g., Cyberduck, Filezilla) or embedded (e.g., inside Dreamweaver) FTP programs to move files among the submission, production, and Web servers.[13] During this transfer, which occurs as part of the multiple-stage copy-editing process, staff members create copies of each webtext as a form of manual version control (see Figure 1).

Moreover, even when CMSs did arrive after 2000 and were malleable enough to use as editorial management systems (around 2010), they couldn't adequately publish stand-alone HTML-based webtexts. Because *Kairos* values the rhetorical qualities of the design of a webtext as much as the written content therein, we could never migrate to a CMS that defaced or subjugated the original HTML designs of authors (see Figure 2).[14]

To preserve the sanctity of *Kairos*'s webtext designs while still signalling that the webtext resides within the journal, *Kairos* uses a toolbar (designed by one of its community members, Karl Stolley). As readers scroll or click through a webtext, the toolbar changes opacity to privilege the design of

FIGURE 2. Screenshot of a webtext from *The Fibreculture Journal*, which moved from a manual HTML setup to a WordPress installation a few years after the webtext (a joint publication by the author) was published. Readers are now instructed to 'click here to open' the interactive text (a hyperlink above 'Abstract'), which then opens in a completely new window not at all connected visually or navigationally to the journal itself.

the author's webtext. Clicking on the toolbar reveals citation information and navigation back to the table of contents of the journal's current issue (see Figure 3).

The problem with doing all this publishing work by hand and not having a CMS with which to organize our editorial processes is an obvious one: it is incredibly time consuming, the work is built on insider knowledge, and it is difficult to transfer knowledge to newcomers. That is, having an artisanal digital journal is not sustainable in terms of time or personnel. We have over thirty volunteer staff members, but only two of
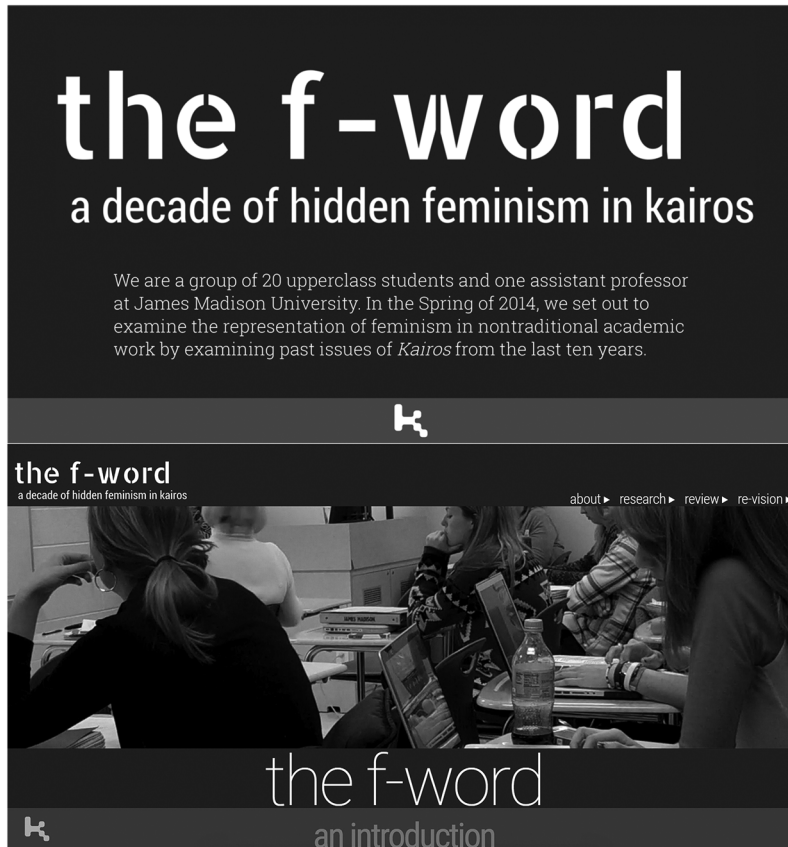
FIGURE 3. This screenshot shows the fourth toolbar iteration in the journal's history. In the upper half, the toolbar is fully opaque, to catch readers' attention and signal the webtext as part of the journal. In the lower half, the toolbar (once a user scrolls) is shown as transparent, so as not to interfere with readers' experiences.
© 2006 the authors; J. Almjeld, A. Michelli, et al., 'The F-Word: An Introduction,' *The F-Word: A Decade of Hidden Feminism in Kairos* 20, 2 (2016), available at http://kairos.technorhetoric.net/20.2/reviews/almjeld-et-al/index.html

us—Senior Editor Douglas Eyman and myself—know the full publishing process from a technological standpoint: *Kairos*'s bus factor[15]—the problem of how to carry on when Employee X gets hit by a bus—was frighteningly bad for the first fifteen years of the journal's existence. To ameliorate this unpredictable situation, we applied for and received

a National Endowment for the Humanities (NEH) Start-Up Grant in 2010 to see whether we could create software plug-ins for the widely used digital editorial platform Open Journal Systems that would allow the system to publish webtexts and similar multimedia artefacts. Unfortunately, the open-source code base for that platform didn't allow for significant enough modification (with the money we had) to make it compatible with multimedia publishing.[16] So we were back to square one without a CMS. In the meantime we also created a training wiki (a platform that allows for collaborative writing and editing) for our staff to use and update during the development and production processes, which has been a huge success and has meant quicker training times for new staff (we hire approximately five new assistant editors every two to three years).

One of the outcomes from the failed NEH grant project and our everyday work with *Kairos* was a set of infrastructural requirements for successful electronic publishing.[17] These infrastructures aren't just *technical*, as one might imagine, but are also *social* and *scholarly*. That is, before any technical infrastructures—whether they be manual workflows or CMSs—can be useful, publishers who want to promote scholarly multimedia have to place themselves within disciplines that *already value scholarly forms of multimedia*. There is no sense in starting a multimedia-based journal in a field that does not already see a need for this type of publishing—there has to be an audience, and from that audience will come authors. This may seem like a duh-piphany, but we've seen this happen even in our own uber-discipline of writing studies (not the sub-discipline of *digital* writing studies), where multimedia journals fail due to a lack of valuable scholarly infrastructure. As well, it was as late as 2011 before research-based art disciplines got their first scholarly multimedia journal in the *Journal of Artistic Research*, despite the fact that multimedia comes from practice-based artistic disciplines. The scholarly rift between research-based and practice-based disciplines is also prevalent in design fields, which still have no scholarly multimedia journal as of now.[18]

Social infrastructure also plays a role in the success of scholarly multimedia journals. As I mentioned above, the discipline of digital writing studies values, among other ideals, collaboration in the writing process. Writing studies has a long tradition of scholarship on collaboration in teaching and researching writing practices, and that practice is transferred

to the editorial praxis for webtextual journals such as *Kairos*. For instance, the peer-review process at *Kairos* is a collaboration among editorial board members that sometimes also involves authors via editorial mentorship. The social network that *Kairos* helps to build within the field, particularly with new scholars, is one of its priorities. Such explicit community building through newbie acculturation is an admittedly unusual stance within journal publishing, although not unheard of in other humanistic disciplines. The social infrastructure may be the most difficult to replicate in other fields, especially since scholarly multimedia requires changing the way basic editorial functions like peer review happen. For example, anonymous peer review is practically impossible in scholarly multimedia because it would require authors to scrub all personal data from a webtext and its media elements. This process would include removing headshots, other visually or aurally identifiable information, and all author and institution metadata from all media files. It would also entail not using any academic, personal, or third-party hosting platforms where authors could be identified through their names, domains, or user IDs. Like I said: practically impossible to review anonymously.[19] In this way, the social and technical infrastructures are linked and require publishers to think creatively or to change radically the processes they have so successfully used to publish print-like scholarship for the last several decades (via print-like digital workflows) or several hundred years (via traditional peer review). It is with these infrastructures and challenges in mind—built on twenty years of experience publishing scholarly multimedia—that Vega, a new scholarly multimedia publishing platform, is being developed.

VEGA: A SUSTAINABLE MULTIMEDIA PUBLISHING PLATFORM

In 2015 the Andrew W. Mellon Foundation funded the Vega project, an academic publishing platform for scholarly multimedia, print-like digital scholarship, and data sets.[20] Vega was formally conceptualized during the 2013–14 academic year, while I was on Fulbright at the Oslo School of Architecture and Design (AHO). While there, I collaborated with the Bengler design studio and with Professor Andrew Morrison, who directs AHO's Centre for Design Research, to draw up the initial specifications for the publishing platform, based on my decades of experience working on *Kairos* and consulting on similar digital publishing projects, as well as on Morrison and Bengler's shared experience building socially engaged

publishing platforms in Norway and abroad. The name for the platform, Vega, comes from an archipelago off the western coast of Norway near the Arctic Circle—a UNESCO World Heritage site with mostly untouched land, except for the eider ducks that inhabit thousands of tiny islands.[21]

As a publishing platform, Vega has workflow features similar to other editorial and submission-management platforms—such as Open Journal Systems, Editorial Manager, and ScholarOne—that include submission tracking, automated email communication, user-info databases, and front-end reader interfaces. What differentiates Vega from other publishing platforms is that, from its inception, it is built to work with and for scholarly multimedia. Multimedia-*authoring* platforms like Scalar are often confused with multimedia-*publishing* platforms like Vega, but the distinction can easily be made with Vega's available editorial workflows, which create a holistic beginning-to-end publishing system. This system includes consideration of the tasks that each stakeholder in the publishing process has, from author(s) to editor(s) to publisher. That is, in a traditional scholarly publishing process, peer review, copy-editing, and layout are crucial stages that an academic text undergoes before being published, whether in print or online. In a scholarly multimedia publishing process, the same stages must be undergone by a webtext, although those stages often happen in a different order.[22]

Vega is the first editorial CMS that accommodates such changes in roles, tasks, and stages in whichever order each publishing venue might need, according to the type of content being published. Vega is actually content-agnostic, which means venues can publish any of the following types of scholarly artefacts:

- print-like articles, chapters, and books (e.g., word-processed documents, PDFs, LaTeX documents, Markdown [a simplified markup language], plain HTML);
- scholarly multimedia webtexts/articles, chapters, and books (e.g., linked sets of multimedia in any Web-compatible combination);
- interactive PDF-type articles, chapters, and books (e.g., print-like articles with embedded animations, movies, audio);
- stand-alone media files (e.g., videos, audio files, slideshows);
- data sets; and
- other file types that may arise in the near future.

~~We had hoped Vega could also publish database-driven installations (e.g., Scalar, Omeka, WordPress, wikis) during its first rollout, but we decided to focus the scope of work on static file types that could stand as preserved artefacts of record, not databases that were still actively being built. That doesn't preclude authors from using a platform like Scalar or Omeka or WordPress to build their webtext and then harvesting or converting it for static HTML preservation (a process known as *scraping*) and publication through a Vega-run venue.[23] That also doesn't preclude someone from using Vega to support database-driven scholarly works in the future — the source code is open, licensed under a generous MIT open-source license, and will be distributed in open repositories once the code base is ready for release. Vega is wholly opposed to charging either upload or download fees for use of its code and is restricted from doing so per our agreement with the Mellon Foundation. (This doesn't preclude parties from offering hosting, maintenance, or upgrade services, however.)~~

Vega is being built as an infrastructure made from a series of Application Programming Interfaces (APIs) — modular and reusable programming tools that specify how software components should interact when combined, like building blocks — which makes Vega flexible. Such an API-centric development paradigm lends itself to creating publishing ecosystems that can be repurposed under unforeseen circumstances instead of producing monolithic platforms that are difficult to adapt and update, such as most of the editorial management systems available now. With APIs other developers can build new front-ends for other contexts and devices, as needs arise. As of September 2016, Vega is set for beta testing with a limited pool of editorial users by mid-2017, with a full release in late 2017 or early 2018.

In addition to the baseline editorial-tracking systems mentioned above, Vega includes composing options for authors who want to create standards-compliant scholarly multimedia in HTML but who don't necessarily know how to author in HTML. Vega won't feature multimedia-authoring functions such as video-editing in itself, but authors can insert their final images, videos, code, formulas, audio files, and so on directly into the Vega-authoring interface as easy as they could into a what-you-see-is-what-you-get (WYSIWYG) program like WordPress, Dreamweaver, or Word. The difference is ~~that~~ Vega produces no code-bloat — ~~it's plain HTML5 with some single-page javascript~~. Authors can also link to

published versions of data sets to create interactive data visualizations using third-party plug-ins. Authors can collaborate with one another or with editors through this interface, with a set of commenting features that telescope (expanding and contracting) depending on where one is within the Vega system. Peer reviewers and editors use the same interface to review and edit submissions, attaching comments in a sidebar notification window that can be revealed depending on whether the publisher wants to initiate collaborative, open peer review or use double-anonymous review for more traditional print-like publishing. In addition, authors who still want to design navigationally rich webtexts, such as those featured in *Kairos* and similar journals, can still author their own webtexts (using whatever technologies a publisher deems appropriate) outside the system and upload them independently. Vega is flexible enough to accommodate nearly any file type.

The following is a summary of features that will guide authors, editors, and publishers through a set of best-practice processes for publishing scholarly multimedia.

- authoring/development tools
- templates for new multimedia authors
- easy and metadata-rich integration of multimedia assets
- reminders to include accessibility elements, such as transcripts
- Markdown-to-HTML converters with multimedia options
- LaTeX, mathematical, and other formulaic and data integrations
- built-in options for Creative Commons/GNU (general public license)/copyright licensing
- peer-review tools
- multiple peer-review workflow options: open, closed, and crowd-sourced
- peer-reviewer tracking, voting, and accountability options, including auto-prompts with suggestions for editorial reviewers
- in-line commenting (to the media-element level) for most submission types
- production options
- seamless navigational interface between development and production tools (e.g., an author's affiliation can be changed in-line where a production editor can see it, rather than requiring multiple clicks outside the immediate environment)

- modular and recursive copy-editing and design-editing workflows
- version control systems that accommodate scholarly multimedia work
- optional (built-in) checklists and links to sustainability, accessibility, and usability standards at relevant workflow stages
- publishing and preservation tools
- customizable metadata schemas, adaptable to publishers' institutional needs
- citation tools for multimedia content (to help authors cite digital media content)
- connections to deep-archive repositories (e.g., LOCKSS) with options for publishers to connect to their own repositories
- pointers to media-hosting or streaming options as well as built-in capturing of linked media elements and accompanying metadata (if desired, with copyright fair use signalling)
- upload options and customizable, templated interfaces for front-end publication branding (e.g., a publisher can customize the look of the journal with its own Cascading Style Sheets or by tweaking one of the supplied templates)[24]

SUPPORTING AND SUSTAINING THE INFRASTRUCTURE

It's one thing to know all of the ever-changing best practices in publishing scholarly multimedia and quite another to build the best platform possible from that knowledge. It's an even larger step to share this work with others and teach them how to use it. My implicit goal with Vega is to seamlessly embed as much of that learned knowledge into the ultra-usable interface so that authors, editors, and publishers can learn on the go. But I also know—as an editor and teacher of academic writing, digital editing, and publishing studies—that the obstacles to creating professional-level publications can be daunting, especially for those who are interested in this area but uncertain where to begin. The apprentice-ship model of publishing[25] is still relevant for digital publishing methods, and it is important to make publishing more accessible to diverse users and producers as we move forward in these kairotic digital times. With this objective in mind, Vega has been supported by the West Virginia University Libraries through its larger educational goal of social justice

and service outreach, specifically through the creation of the Digital Publishing Institute (DPI).

Once Vega comes online in 2017, the DPI (http://dpi.lib.wvu.edu) is the institutional umbrella under which Vega will be sustained long-term as a research project that is also used for hosting services. Hosting services are an excellent way for libraries to reach out to academic publications—especially small, independent, or organizationally affiliated (i.e., member-driven) journals in the humanities and social sciences, but also the sciences—by offering online hosting for open access or subscription-based publications as well as editorial and layout services. The DPI will offer such services within the year, with proceeds returning to the development of Vega. As well, the DPI will offer classes, seminars, and workshops for authors, editors, publishers, and librarians interested in learning more about the development life cycle (from authoring to preservation) of scholarly multimedia. For instance, beginning in the summer of 2017, the DPI will host the inaugural KairosCamp (http://kairos.camp) for authors to learn how to build webtexts using standards-compliant Web-design tools. This is a hands-on two-week workshop during which authors will build parts of their webtexts while learning about larger social and scholarly infrastructural issues they will need to navigate as part of the hiring, tenure, and promotion systems in academia. Finally, the DPI also aims to initiate introductory editorial workshops at conferences such as those sponsored by the Library Publishing Coalition and the American Association of University Presses. These workshops will help support continued development of scholarly multimedia and digital publishing tools that the DPI works on, including Vega, because, without active teaching of and use of the multitude of digital publishing platforms being created (with sponsorship by the Mellon Foundation, among others), scholarly publishing will find itself in another five to ten years wondering where all its readers went.

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NOTES

1. University of Colorado College of Media, Communication and Information, 'New Journal Will Pioneer Use of Multimedia in Scholarly Publications' (20 November 2015), available at http://www.colorado.edu/cmci/2015/11/20/new-journal-will-pioneer-use-multimedia-scholarly-publications. See also [in]Transition's About page, http://mediacommons.futureofthebook.org/intransition/about-intransition, from 2015–16.

2. Gregory Crane, '"Hypermedia" and Scholarly Publishing,' *Scholarly Publishing* (April 1990): 131–55

3. Cheryl E. Ball, 'Sustainable Infrastructures and the Future of Writing Studies,' *WPA: Writing Program Administration* 39, 1 (2015): 122–37; Douglas Eyman and Cheryl E. Ball, 'History of a Broken Thing: The Multi-Journal Special Issue on Electronic Publication,' in Bruce McComisky, ed., *Microhistories in Composition Studies* (Logan, UT: Utah State University Press 2016)

4. Douglas Eyman and Cheryl E. Ball, 'Digital Humanities Scholarship and Electronic Publication,' in Jim Ridolfo and William Hart-Davidson, eds., *Rhetoric and the Digital Humanities* (Chicago: University of Chicago Press 2015)

5. Cheryl E. Ball, 'Designed Research: Publishing Designs as Scholarship,' in Y.-K. Lim, K. Niedderer, J. Redström, E. Stolterman, and A. Valtonen, eds., *Proceedings of DRS 2014: Design's Big Debates* (Umeå, Sweden: Umeå Institute of Design, Umeå University 2014), 1229–43

6. Cheryl E. Ball, 'Assessing Scholarly Multimedia: A Rhetorical Genre Studies Approach,' *Technical Communication Quarterly* [Special issue: Making the implicit explicit in assessing multimodal composition] 12 (2012): 61–77

7. Cheryl E. Ball, 'Multimodal Revision Techniques in Webtexts,' *Classroom Discourse* 5, 1 (2013): 1–15

8. Cheryl E. Ball and Douglas Eyman, 'Editorial Workflows for Multimedia-Rich Scholarship,' *Journal of Electronic Publishing* (Fall 2015), available at http://quod.lib.umich.edu/j/jep/3336451

9. 'Webtext' is the term *Kairos* has used since 1996 to refer to a piece of scholarly multimedia, the latter a term that came into use around 2004 when *Vectors Journal*, another digital-media-only venue, began using it to refer to its publications (see https://call-for-papers.sas.upenn.edu/cfp/2004/02/19/cfp-vectors-multimedia-projects-evidence-or-mobility-31204-e-journal). I use these terms interchangeably.

10. See, for example, the white paper from the Moral Dimensions of Open Access at the 2016 Open Scholarship Initiative, which I helped to author: http://osinitiative.org/osi-reports/osi2016-reports/report-from-the-moral-dimensions-workgroup/.

11. The staff were initially graduate students, but the demographics have changed as the field has matured so that lead and section editors are primarily, but not exclusively, tenure-track and tenured faculty members. Most section editors are employed at teaching-intensive universities.

12. There is no governing organization that captures membership numbers in this field, so I am guessing at a membership number based on attendance at the annual Computers & Writing conference—the primary convention for digital writing studies—which typically attracts fewer than 400 scholars. This sub-disciplinary conference is expensive for our field, changes locations every year, and is almost always at a small university campus that is transportationally challenged, so only a portion of those who might self-identify as digital writing scholars show up every year. Colleagues whom I asked suggested the numbers might be as high as several thousand.

13. In reality, it's one server with several virtual private servers, or VPSs.

14. For sustainability purposes, we require all webtexts to have at least one HTML page on which to embed any content. This allows us to embed metadata, including the navigational toolbar, into the HTML page for search-engine optimization and preservation purposes. Additionally, all content in a *Kairos* webtext must be preserved, if not hosted, on the *Kairos* server. For more on why these requirements have been established, see Eyman, Ball, Boggs, Booher, et al., 'Access/ibility: Access and Usability for Digital Publishing,' *Kairos: A Journal of Rhetoric, Technology, and Pedagogy* 20, 2 (2016), available at http://kairos.technorhetoric.net/20.2/topoi/eyman-et-al/index.html.

15. See https://en.wikipedia.org/wiki/Bus_factor.

16. See my white paper for the grant at http://ceball.com/2014/07/17/building-a-better-back-end-neh-dh-white-paper/.

17. Eyman and Ball, 'Digital Humanities Scholarship'

18. The reason why design disciplines don't yet have a scholarly multimedia journal has less to do with their scholarly infrastructure these days and more to do with the lack of technical infrastructure. Indeed, the Vega project stemmed directly from a failed project to start a design journal that published scholarly multimedia during my Fulbright year (2013–14) with Professor Andrew Morrison at the Oslo School of Architecture and Design.

19. For more details see Ball and Eyman, 'Editorial Workflows.'

20. For the complete Mellon proposal narrative, see http://ceball.com/2015/01/08/cairn-an-academic-publishing-platform-proposal/.

21. In the archipelago, as the tide goes out, more islands rise from the depths—just as more publishing venues should rise from Vega as it enables easier adoption of digital publishing. As a metaphor for digital publishing, it is outstanding. I thank

Bengler principal Even Westvang for the perfect name, after many stumbles to find the right one.

22. See Ball and Eyman, 'Editorial Workflows.' For instance, when editing a webtext, it makes no sense to spend eight to twelve hours copy-editing for grammatical errors and the like if the design of the webtext is broken (e.g., has structural usability errors in the HTML code that prevent it from working on modern browsers or screens). I realized this workflow problem in 2006, after I had spent forty hours copy-editing a particularly large and onerous webtext for *Kairos* only to discover that the interface had been designed (in a proprietary program called Flash) in a way that was completely unusable and would not necessarily have been noticeable by peer reviewers (who are not responsible for conducting usability tests during their reviews). I had to send that webtext back to the authors for redesign, and I immediately changed the production workflow for subsequent webtexts to conduct design-editing prior to line-editing and reference checks.

23. *Kairos* has scraped WordPress-based submissions in the past (using WGet or similar programs), which aids us as a publisher in having to maintain links and patch security holes that systems like WordPress are notorious for. In mid-2016 *Kairos* stopped accepting WordPress submissions altogether, instead asking authors who wanted to use WordPress to build webtexts, for lack of HTML knowledge, to scrape them and clean up the information architecture themselves before submitting them for review.

24. There are even more features to Vega than I can write about in this single article, so I would encourage interested readers to stay tuned at http://vegapublish.com, where you can also sign up for our low-traffic email updates, follow our development blog, watch presentations on Vega-in-the-making, see how our technology stack is built, and find out more about the Vega team. By January 2018, Vega will be available for free to download, use, and add onto by anyone interested.

25. For more on apprenticeship models of publishing, see discussions of editorial pedagogy in a set of three articles I wrote in *Hybrid Pedagogy* at http://www.digitalpedagogylab.com/hybridped/editorial-pedagogy-pt-1-a-professional-philosophy/. See also Jesse Stommel's discussion of how academics can enact *publishing as pedagogy* at http://www.phd2published.com/2012/04/12/2020/ and how librarians can enact the same (from University of Michigan Library) at http://er.educause.edu/articles/2016/1/publishing-as-pedagogy-connecting-library-services-and-technology.