DESIGNING RESEARCH INFRASTRUCTURE FOR OPEN-ACCESS PUBLISHING

ENGAGEMENTS

CHERYL E. BALL

WEST VIRGINIA UNIVERSITY

CHBALL@MAIL.WVU.EDU

ABSTRACT

This short paper introduces how design research can change the power dynamics at play in commercial publishing so that they are shifted from the publishers to the people - that is, the researchers and scholars who want to publish design research in traditional and non-traditional modalities. Making our research as publicly accessible as possible through open-access publishing (as well, in this case, through inclusive language) can only serve to disrupt the uneven power balance in academic publishing.

The paper briefly introduces the basic concepts of open-access scholarship as they relate to digital publishing, provides a short case on multimedia publishing relevant to practice-based design research, and discusses the importance of designing technical infrastructures that can help design fields publish this kind of OA scholarship. The case is an in-progress design project in which a team from the USA and Norway are collaboratively designing a new academic publishing platform called Vega that will be radically innovative for designers, scholars, and publishers.

THE RISE OF OPEN-ACCESS SCHOLARSHIP

The medium of academic publishing has changed radically in the last 20 years, since the advent of the Web in the early 1990s, although that change has come more slowly to the humanities and social sciences, including design studies, than in the hard sciences. The creation of disciplinary-specific repositories in the early 1990s flourished in the sciences with examples such as arXiv.org now containing over 1 million pre-prints. *Pre-prints* are articles written for submission to peer-reviewed journals but which have not yet undergone the peer-review process. A *post-print* is the manuscript *after* it has been peer-reviewed but before it has been copy-edited. The concept of pre-prints and post-prints have been widely accepted and used in the sciences for almost three decades and are de facto *open access*, meaning that this scholarship - even as it is only in draft form - is freely available on the Web for anyone with an Internet connection.

The technological changes due to the Web have made open access a viable alternative to distribution methods for print-based work. Printed artifacts, such as mailed journals or those accessed through primarily pay-walled databases such as JSTOR and ArkDok are closed-access scholarship, a form of scholarly publishing that some academic and all commercial publishers have perfected to the tune of billions of dollars a year in profit and the regimentation of publishing designs. It is against that template-driven form of scholarship and towards interactive, digital and media-rich design research that capitalizes on the gift economy of open-access (OA) that this paper addresses. (For more discussion of the potentials of web-based design-research scholarship, see, e.g., Ball 2014.)

There are two basic models of OA: (1) *Green access* is the version associated with publishing pre-prints and post-prints on disciplinary and institutional repositories. There are many journals that allow authors to do so, although this is more rare with smaller publishers, such as small societies or university presses. (2) *Gold access* is generally associated with publishing venues that have made work freely available to readers on the Web through completely OA journals or hybrid OA options, such as those with embargo periods. (*Hybrid journals* are ones where only some of the content is openly available to readers.) Gold access is made possible by charging authors to publish their work in OA formats. These charges are called Article Processing Charges (APCs), which cost as much as $5,000 USD per article.

Unsurprisingly, distributing scholarship in gold OA journals has proven to be a highly profitable operation for many publishers, especially those known as the Big Five: Elsevier, Springer, Wiley, Taylor and Francis, and Sage (Larivière et al. 2015). The open access fees for these publishers range from $3,000 USD to $5,000 USD, plus tax, for a single article. (Prices in Euros are also available on these publishers' websites.) Over the last decade, Elsevier, as one example, has consistently made over 30% in profit margins and, in 2015, brought in over $25 billion USD dollars in revenue (Cookson 2015). These fees have out-priced all but the most luxurious of institutions and scholars and have made gold OA for the humanities, arts, and social sciences completely impossible. The sciences have generally accepted these charges as an outgrowth of the Internet's technological capabilities because scholars have seen the effectiveness of OA in speeding up peer review, publishing in a more timely manner, and offering results that may be replicated more quickly for the betterment of science and, thus, the general population (see, e.g., PLoS, no date). OA has also been shown to increase citation rates for scholars, which in turn affect the impact factors of journals, adding to the prestige of both (MacCallum 2006; Xia et al 2010).

LIBERATING SCHOLARSHIP: A RADICAL OA MODEL

In the humanities and social sciences, the embrace of open access models of any form have been much slower, with the exception of one unexpected disciplinary collaboration: a subfield of creative writing known as electronic literature and a subfield of rhetoric and composition studies called digital writing studies (Ball 2014). E-literature uses digital technologies such as hypertext markup language (HTML) and digital media to craft poetry, fiction, and other creative genres, which are published online in open-access literary magazines. Two of the oldest examples of such journals include *New River Review* and *Born Magazine*, the latter of which stopped publishing in 2011 after 15 years (Trimble 2012). Electronic literature can be considered a precursor to digital storytelling in the way it speculatively mixes art, multimedia, sound, and creative writing genres

through digital means of delivery. The early scholars of e-literature were often also early scholars in digital writing studies (Moulthrop, *personal communication*, 2014) where the focus on academic writing allowed researchers to study and teach how to use links, nodes, and rhizomatic reading paths to create persuasive writing for distribution in digital formats on the Web (Bolter 2002; Joyce 1994; Syverson 2001).

The subfield of digital writing studies had its own crop of online, peer-reviewed journals such as *Computers and Composition Online* and *Kairos,* the latter of which began publishing in 1996 under the original subtitle, *A Journal for Teachers of Writing in Webbed Environments* and today has the subtitle *Rhetoric, Technology, and Pedagogy*. *Kairos,* and other digital writing journals like it, publish *webtex*ts, which are scholarly articles designed as non-linear websites - peer-reviewed research, often involving forms of communication design research, that can NOT be printed, or print-like, and maintain its argument (Ball 2004; Eyman 2006). Webtexts have to enact their content in some designerly way, and authors explore all sorts of experimental, rhetorical designs (Kalmbach, 2006; Warner, 2007). As a journal begun by upstart graduate students who insisted on being able to put into action the rich theories on writing and meaning-making in digital environments that they were reading in the top postmodern literary studies books at the time - such as George Landow's (1994) *Hypertext* and Janet Murray's (1997) *Hamlet on the Holodeck - Kairos* was new, exciting, innovative, and not a little bit dangerous, academically speaking (Ball 2017; Eyman 2006). Webtexts liberated themselves from the previous 300 years of scholarly communications traditions (see Ball and Moeller 2008; Fitzpatrick 2010), not the least of which through being entirely open access.

But *Kairos* is not simply in the green or gold variety that most OA proponents and researchers are familiar with, as I have explained above - *green and gold OA* didn't become known until the mid 2000s, nearly 10 years into *Kairos'* publication history, when several worldwide OA initiatives were announced (i.e., Berlin Declaration in 2003). *Kairos* is a kind of gold open-access, but it's business model - which does not rely on author fees or subscriptions or any other type of income - is free, a rare model of open-access predicated on a gift economy in which publishers charge nothing to publish research, and authors, readers, and librarians pay nothing to submit or access that research. For many gratis business-model OA journals, the scholarship published within is predicated on a *libre* rights model, where authors and

readers are free to do whatever they want with the content. Publisher agreements for such journals are usually written using copy-left Creative Commons licenses instead of traditional copyright.

Kairos is all of these things - free for authors and readers and librarians, with an aggressive Fair Use policy that doesn't require typical permissions for any media usage before publishing, and rights statements that revert copyright to the author after first publication. As we say at the journal (I have been an editor at *Kairos* since 2001): Open access before OA was a thing. Publishing on the Web before you knew what the Web was. A radically liberating model of scholarship in a digital journal that has become the most longstanding one in its field. *Kairos* serves as a model of experimental, scholarly multimedia that changes the power dynamics of publishing for multiple disciplines.

The term *webtext* is mostly *Kairos* -specific, so for the rest of this paper, I will adopt the phrase *scholarly multimedia,*which has gained prominence across several disciplines since the late 2000s and which incorporates more kinds of genres than the web-based webtexts I discussed above (see also Ball 2017). Scholarly multimedia can include stand-alone videos and other types of visualizations and multimedia that don't rely on the link-based reading paths fundamental to Vannevar Bush's first imagining of the Internet in his 1945 *Atlantic* article "As We May Think." But scholarly multimedia still relies on that technological infrastructure - OA research is delivered through the Web these days, with its architecture of hardware, software, networks, facilities, and, lest we forget, humans that function together to produce peer-reviewed research on our screens.

Given the importance of humans in these systems, perhaps it is *not* ironic that some of the most innovative scholarly publishing platforms for promoting open-access work, such as Open Journal Systems, have come from humanistic and social-science disciplines. But, oddly, until the project discussed in the next section, there were no systems that would support scholarly multimedia (in OA or non-OA systems). So, now we turn to our case study.

VEGA, AN ACADEMIC PUBLISHING PLATFORM

In 2015, researchers Cheryl Ball (West Virginia University) and Andrew Morrison (Oslo School of Architecture and Design) received a $1 million grant from the Andrew W. Mellon Foundation to design and build an academic publishing platform called Vega that would support scholarly multimedia and other digitally driven research products. Design studio Bengler, in Oslo, is developing the platform, which is being built as an open-source technology that anyone can use or modify for their individual or commercial publishing or pedagogical needs. While Vega can be modified for other uses including the publication of print-like scholarship and datasets, the foundation of this platform is for multimedia-driven OA scholarship. Vega is content-agnostic and contains an authoring interface, where scholars can write and also embed multimedia within the system, which can then be submitted for editorial or peer review.

Imagine, for instance, being able to upload a digitally created research design and annotate it as part of your publication. That is a primary function of Vega, which implicitly promotes open-access through the varieties of openness the system features.

For instance, a key feature that promotes openness is the editorial review system, which comes standard with several types of peer review workflows: traditional double-anonymous review (an option that already exists in other submission management systems, so it's not that extraordinary) and collaborative or crowd-sourced reviewing peer-reviewing. Collaborative reviewing has always been done with scholarly multimedia webtexts due to the impossibility of making much multimedia content anonymous (Ball 2015). It's ridiculous to scrub a face or alter a voice from a video just for the purposes of peer-review. And hosting on personal or academic server space has always been the de facto method for submitting scholarly multimedia in most fields. Both of those authoring options reveal the author, so collaborative peer review has always been used, not only to reduce bias of individual reviewers but also to encourage conversation and draw on multiple sets of expertise about a submission (Ball 2015: no pagination). Of course, not all disciplines value collaboration in peer review, but there is precedence for this kind of interaction among reviewers, as well as for collaboration between editors and authors during the revision process, which Vega will also support.

Vega also features the ability to brand a venue's interface or content in ways that other systems do not allow or easily provide with significant help from programmers (Ball 2015). The easily customizable interface will be of special interest to journal editors, press directors, and other stakeholders in small independent, nonprofit, or commercial publishing houses, and the list of features goes on (see Ball 2017).

The project team, with a combined two decades of experience editing scholarly multimedia publications, implemented as many best practices for managing and sustaining scholarly journals into Vega's technological infrastructure in the hopes that all publishing stakeholders - scholars, editors, publishers, librarians, readers, and funders - will find the system not just easy to use, but a joy to use. For instance, when the team leader asked the design studio how the help functions would be implemented into the system, the design principle responded that "if we need help functions for the authors, we've designed the system wrong." This response won't be surprising for other designers, but for the thousands of scholars around the world who might end up using this system, such a designerly statement is profound.

Vega's goal is to profoundly change the scholarly communication landscape, through design, by opening up the possibilities for publishing multimedia artifacts in accessible and sustainable ways. It's not just a

platform to promote, but an approach to research production and dissemination that radically changes the dynamics of access for researchers across the world. One scholar recently described her experience with using open-access scholarship, saying that it "has become a powerful solution to the barriers that researchers in developing and transition countries face trying to access and share critical research that can improve people's lives" (Chayn 2014). Open access scholarship has long been at the heart of the conversation of global power dynamics, equality (particularly in literacy practices), and health and well-being, as John Willinsky, an early and staunch proponent of the open-access movement and creator of Open Journal Systems attests in his foundational 2006 book, *The Access Principle: The Case for Open Access to Research and Scholarship.* Vega is one way that this group of design researchers' is attempting to make a dent in that conversation.

CONCLUSION

Vega is an important design research project in its own right, as the project team researched its own practices of scholarly multimedia and scholarly communication through the lenses of communication design and interaction design in order to build a technological infrastructure that would speak to design practitioners and scholars alike. Because the majority of this type of scholarly communication has come out of humanistic fields without the support of technical infrastructures that help maintain the scholarly multimedia record, many journals like *Kairos* have been ill-maintained, lost, or even scrubbed entirely from the Internet (Ball 2016; Eyman and Ball 2016). There are lots of reasons why these problems occur, but let me briefly provide one example, which necessitates the importance of creating and maintaining a research infrastructure useful and usable for experimental, multimodal journals (regardless of discipline).

In 2002, five digital journals in rhetoric and composition (the uber-discipline to computers and writing) following the *libre/gratis* variety of OA, co-published a multi-journal special issue in electronic publishing. The issue was one of the first to openly discuss digital scholarship, digital pedagogy, and tenure, and therefore was of particular interest to the humanities and the rest of academia, both then and now (see Blakesley et al. 2002). Within two years, four of the five journals - all of which were well-respected in the field - had stopped publishing, changed content management systems which broke all their links, or had been scrubbed from the Internet altogether.

While some of that work was able to be recovered by other editors and relinked for posterity—after all, this was peer-reviewed research that several of the authors had used for their tenure cases—one of the journals, the one that had been disappeared—was the only one run by a major scholarly society (in this case, the National Council of Teachers of English, NCTE). The rest were either independent (where the editors served as the publishers, such as with Kairos) or run by consortia so small that they might as well have been independent.

The only journal that kept publishing through that multi-journal special issue was *Kairos*, in part because the journal has always been crafted by hand. Every HTML page and folder has been named by a human, moved from one computer to another through FTP, copy-edited and design-edited through manual version-control (i.e., copying entire folders and renaming them). This is not something most humanities and even design scholars are comfortable doing—but understanding information architecture, web design, and information technology systems had been a required part of publishing scholarly multimedia up until now. In addition, for small, independent journals that publish on a gratis business model (as most scholarly multimedia journals do), free tools are crucial, but they also make it more difficult for editors who are *not* as familiar with digital technologies to support and maintain their own systems.

And while there are free content management systems that would support such journals - such as Open Journal Systems - those systems don't support the long-term publishing and preservation of scholarly multimedia. This is a massive technological infrastructural problem that most OA journals wanting to publish some multimedia content cannot solve on their own. And that's why Vega will, we hope, be of much use – not just for editors, but for designers and other scholars who want to change the way they publish their research, the kinds of research they can publish, and who they can reach through open-access means.

Of course, the possibilities presented by Vega articulate a disciplinarization of design studies that is not yet a settled argument in the field (Joost et al. 2016). In introducing the section on disciplinarity in *Design as Research*, Michelle Christensen writes that as design studies experiences the "quick expansion of boards and journals… the policing of peers, and the self-importance of titles, degrees and publication lists" (Joost et al. 2016: 184) - all elements of power and authority within academic systems - these elements can both "empower and enfeeble design research as a whole" (p. 183). I choose to use Vega in a way that can break design research out of its templated, two-column, 10-point typefaced conference papers and articles and celebrate the necessity of experimentation as research that has been at the heart of design studies since its disciplinary nascence.

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