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# Interdisciplinary, Interactive, and Online: Building Open Communication through Multimodal Scholarly Articles and Monographs

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## Abstract

The emergence of digital scholarship in the humanities and the social sciences has brought a renewed emphasis on culture, at the levels of modelling and communication. New forms of digital scholarship—including projects in big data, physical computing, and gameful design—experiment with methods for modelling cultural data, considering how the historical and social issues addressed by the humanities and the social sciences can be expressed through electronic means. Alongside these advances, equal progress is under way in the realm of scholarly communication. Developments in the areas of peer review, scholarly collaboration, and digital publishing, including the development of Open Journal Systems (OJS), spur the growth of online cultural and intellectual communities surrounding humanistic endeavour. As these advancements progress alongside each other, the question of how they might be integrated remains. Coupling advancements in the realm of digital scholarship with new forms of publishing and peer review promises to leverage the affordances of both, making public-facing platforms for cultural content, while building vibrant intellectual communities around them.

## Keywords

Cyberinfrastructure; Digital scholarship; Internet publishing models; Knowledge dissemination; Publishing platforms; Tools and practices

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In what follows, I consider the possibilities for uniting text-based scholarship with their multimodal counterparts, focusing on features and platforms that promote the discovery and use of both. I suggest that scholarly publishing holds the promise of cultivating a renewed public-facing humanities by developing platforms for integrating multimodal and text-based forms of scholarship. My suggestion is not to advocate the development of a peer review process for new media scholarship (a question already taken up in depth elsewhere), but rather to stake out the potential for integrating multimodal components into existing text-based scholarship. By bringing the social and cultural affordances of multimedia to the scholarly article and monograph, publishing platforms are uniquely positioned to serve as hubs of intellectual activity that bring together communities across different disciplines, institutions, and sectors. The result would be not simply scholarly content, but more importantly scholarly platforms, which are interdisciplinary in their scope, interactive in their approach to user feedback, and able to unite multiple communities of intellectual practice online.

### The importance of cyberinfrastructure

Approaching interdisciplinarity and interactivity from the perspective of platforms and features, rather than simply content, requires identifying where technological infrastructure meets social and cultural practice. This specific layer or platform has been identified elsewhere through the term *cyberinfrastructure*. As the 2006 American Council of Learned Societies (ACLS) report titled *Our Cultural Commonwealth* explains the term:

[C]yberinfrastructure is more than a tangible network and means of storage in digitized form, and it is not only discipline-specific software applications and project-specific data collections. It is also the more intangible layer of expertise and the best practices, standards, tools, collections and collaborative environments that can be broadly *shared* across communities of inquiry. (Unsworth, Courant, Fraser, Goodchild, Hedstrom, Henry, ... Zuckrman, 2006, p. 6, italics in original)

As calls for investment in cyberinfrastructure suggest, organizing knowledge should no longer be conceived as a solitary activity, since it depends upon both the best practices and the technological infrastructures that underpin its representations. Indeed, this has always been the case (as the current state of scholarly journals and monographs demonstrates, and as Kathleen Fitzpatrick has indicated in her history of peer review); however, the new functions afforded by cyberinfrastructure call for new approaches to the platforms used to share and organize cultural knowledge with others (Fitzpatrick, 2011). Given this reality, the state of scholarly journals and monographs is intimately tied to the future role of humanities research, since re-imagining both involves making infrastructural investments that situate humanities knowledge within broader public and university contexts, explicitly building cultural communities within and around those contexts.

Investments in cyberinfrastructure should therefore be understood as strategic development for the future of the cultural and intellectual communities into which humanities scholars figure, and which embody the significance and relevance of humanities and social sciences research. From this perspective, accounting for the key

role cyberinfrastructure plays in the development of intellectual communities requires understanding it not simply as a technological resource, but also as a cultural one. To this end, I will outline select key affordances of multimodal research and corresponding developments in cyberinfrastructure that promise to expand and extend them. The developments I discuss operate as granular instances of feature and platform development that may prove useful in the context of scholarly publishing; more broadly, though, these advancements also function as case studies in cyberinfrastructure development. As such, they also serve as provocations meant to generate discussion and to incite new lines of collective investigation, gesturing toward what a blueprint for multimodal scholarly publishing might look like. This investigation proceeds through a re-evaluation of two key attributes of digital scholarship as design principles for Web 2.0 environments: interactivity and interdisciplinarity. In light of these terms, I argue that investment in the layer that undergirds online scholarship (specifically, publishing platforms) requires explicit cultural and intellectual care.

### **Interactivity and/as intellectual engagement**

One key affordance of multimodal research is its ability to inspire and provoke diverse means of grasping and interpreting arguments. The tight-knit relationship between multimedia and scholarly interpretation is not a new one. Indeed, multiple scholars working in the realm of new media scholarship and prototyping argue that digital and interactive knowledge representations embody rigorous scholarly production. Among these advocates are Alan Galey and Stan Ruecker (2008), Cheryl Ball (2004), Johanna Drucker (2003), and Kari Kraus (2009), to name just a few. Collectively, their scholarship calls for understanding the interactive nature of new media through their ability to model and communicate scholarly arguments, making interactivity not (uniquely) a function of interface, but rather one of interpretation and argument. In other words, interactivity in the context of multimodal knowledge representation means grappling with arguments and ideas, beyond simply manipulating images, text, and the like.

From this perspective, interactivity is therefore central to the intellectual culture of the humanities and the social sciences. In the humanities in particular, theories and interpretations function as deeply social constructs, generating new research questions and provoking new possibilities for tool and project development. Interactivity and interpretation can be thought of as social actions supported by specific types of scholarly infrastructure, including publications, conferences, libraries, archives, blogs, and so on. John Unsworth has notably offered a rubric for understanding interactivity and interpretation at the level of infrastructure, arguing that strong theories inspire new research hypotheses and directions for experimentation (Unsworth, 1997). Approaching interactivity from the perspective of the cyberinfrastructures that shape and facilitate it, rather than solely the forms of knowledge representation through which it is expressed, allows us to investigate which investments at the level of platform and feature development might best inspire the type of intellectual activity that rests at the core of humanities research. It further allows us to consider how these activities might be extended and expanded in Web 2.0 environments.

A look at social platforms for multimodal content online indicates that a key affordance of integrating multimedia with community-driven feedback is the ability to crowd-source new uses for and approaches to the product being shared. What distinguishes these forms of multimodal feedback from more traditional forms of criticism or review is their emphasis on user implementation. One Web 2.0 platform that generates such types of multimodal and user-focused feedback is a video game and software distribution platform called Steam. Over the past few years, changes in the Steam platform have focused on cultivating communities of engagement around the games it hosts and sells. This engagement is built through feedback and discussion surrounding game development projects (with a notable emphasis on independent projects that find a community space through the platform's Greenlight page). Using Steam to learn more about a particular game development project, a user will therefore encounter instances of how that project is being engaged by the Steam community, often articulated through multimedia comments. Such forms of feedback may include, but are by no means limited to, user-written guides, videos or webcasts, screen captures, user-made videos and images that engage the project, and user modifications (or game mods) (Valve Software, 2013). These forms of community-driven engagement sit alongside traditional reviews or criticism (aggregated through Metacritic) on a Steam page; in many cases, they offer a more detailed and accessible view of the project at hand, emphasizing in what ways and to what extent people are using the game—what they are doing with it—rather than only providing sole-authored critiques of the game's structure, narrative, or mechanics.

Other Web 2.0 platforms demonstrate a similar community-driven focus on use through multimodal feedback. Thingiverse, a social platform for sharing 3-D models intended for desktop fabrication, contains a range of different forms of feedback attached to a given object. The feedback field "I made one," for instance, invites users to upload images of objects they have printed themselves, offering examples of a successful printing process (highlighting any potential hiccups) and samples of the final printed object, including what functions it may serve. The "remix it" field similarly invites users to produce their own version of the object, again turning to the community to provide instances of how the object at hand might be used or repurposed (MakerBot Industries, 2013). Community-driven testing and feedback is also a core feature of GitHub, a social platform for collaborative code and project development, which enables users to copy a given project to create their own version intended for experimentation and reuse. The results of this parallel or tangential process of code development (known as *forking*) can then be re-integrated into the original project codebase if the users involved so desire, in what is referred to as a *pull request*. In addition to forking and pull requests, GitHub also includes an issues tracker that lets users post any problems they encounter with a project, including potential solutions (GitHub, Inc., 2013).

Across these instances, the features of each platform specifically cultivate communities of practice around hosted content, leveraging multimodal feedback (including video, image, sound, guides, tutorials, and issues) to demonstrate how the content is engaged and used by the community. Although the specific features of these platforms may not neatly import into a scholarly context, the role of cyberinfrastructure in developing community interaction, or interpretation, offers a way forward. Given interactivity as

one of the cornerstones of digital research, electronic scholarship invites feedback that focuses on use and user action, including multimodal demonstrations of such engagement. For instance, a publication on big data might release a sample dataset, workflow, and visualization images embedded in the published article. Such research offers a set of humanities data coupled with methods for making that data actionable through a given tool, approach, or workflow. Community-driven feedback that emphasizes user implementation is suited to take up the interactive and interpretive elements of these publications, through multimodal feedback including user-generated visualizations, guides for pedagogical applications, or a video of how scholars modify and deploy, or “fork,” the research materials to fit their local and institutional needs (to name just a few possibilities). As the Steam platform demonstrates, these forms of feedback do not replace peer review; however, they do engage the project at hand in a process of rigorous evaluation by demonstrating how it might be implemented in multiple environments, addressing potential problems or concerns in deployment. Coupled with traditional forms of academic critique, then, multimodal and community-driven interaction with publication materials can extend and enrich the theoretical and interpretive heart of research in the humanities.

### **Infrastructures for interdisciplinarity**

The relationship between multimodal feedback and communities of intellectual engagement, specifically as it unites the two through cyberinfrastructure or platform design, holds the further potential to cultivate new interdisciplinary lines of conversation online. The affordances of multimedia here are twofold. First, since multimodal knowledge representations communicate scholarly inquiry through non-textual (or not purely textual) means, they are uniquely poised to communicate research from a given field to audiences who are not familiar with the specific writing conventions of its discipline. A data scientist, for instance, might not be familiar with the cultural and geographical history of Paris, yet she will be able to engage with the data model used to produce a warped three-dimensional map of the city, and able to respond to the project through multimodal feedback including alternate datasets, workflows, or forms of graphical display.

The second key affordance of digital multimedia is their ability to circulate through multiple communities on the Web, moving through platforms such as Vimeo, YouTube, Flickr, Twitter, and the like. In the short term, then, embedding multimodal components in text-based articles promises to widen the audience exposed to such work, since digital multimedia can circulate through socially networked platforms and direct new audiences toward the publication at hand. As Clifford Tatum and Nicholas W. Jankowski suggest in “Beyond Open Access,” “The fact that the role of scholarly communication varies across different fields has implications for how we understand new communication practices emerging through the possibilities of openness afforded by digital media” (2013, p. 189). Through their increased accessibility and ability to traverse the Web, multimodal elements can serve as key points of contact between dispersed disciplinary and institutional communities. They permit audiences in different fields and sectors to interact with online publications, and to further evaluate and extend their use beyond a singular disciplinary context. Furthermore, approaching the interdisciplinary potential of multimedia at the level of cyberinfrastructure allows

scholars, librarians, and publishers to explicitly grapple with potential solutions for expanding the audiences reached by digital journals and monographs.

By approaching interdisciplinarity at the level of platform design, rather than only taking an interdisciplinary approach to scholarly content, the affordances of digital multimedia can be leveraged through specific technological developments. Circulating multimodal elements of scholarly publications through social platforms such as Vimeo encounters the long-term issue of sustainability. It further invites a refined approach to community involvement, engaging specific communities of practice through infrastructural investments (rather than casting too wide a net by addressing any passing social media user). Solutions in this field therefore require developing strategic partnerships across institutions, integrating the cyberinfrastructure under consideration with existing institutional infrastructures, such as libraries, archives, and museums. Such venues (libraries in particular) have served as intellectual and cultural hubs that bring together multiple communities within and around the academy and, as Kathleen Fitzpatrick has suggested, integrating library infrastructure with publishing infrastructure offers significant advantages for expanding the scope of scholarly engagement through publication (2011). Approaching interdisciplinarity at the level of cyberinfrastructure, rather than scholarly research or content alone, invites us to ask how scholars in, for instance, the sciences might encounter humanities data (and vice versa) through a media-first exposure to research.

### **A platform approach**

Considering the potential for blended textual and multimodal scholarly articles and monographs invites us to identify the specific cultural and intellectual features of such content and explore which corresponding technological solutions might best improve them. In short, it requires an approach that considers both the technological and cultural affordances of specific infrastructures, in what Steven Jones refers to as *platform thinking* (2014). This indicates one potential future for scholarly articles and monographs by taking up the lines of development suggested by digital multimedia and its social components, following those lines through a platform approach. This strategy requires thinking of interactivity and interdisciplinarity not simply as aspects of scholarship (or scholarly research), but also as key design principles that correspond to strategic areas of infrastructural investment. Investing in and experimenting with these principles enables us to reconceive the online functions of scholarly content, as the layer of technologies and practices supporting that content (first) cultivate the forms of intellectual and cultural engagement such work calls for, while they (second) expand the audiences engaged with key cultural issues in humanities and social sciences work. The results are not only scholarly publications or digital platforms, but rather the attention and engagement cultivated through both that are interdisciplinary in their scope, interactive in their approach to the community, and specifically attuned to the cultural engagement generated through online platforms.

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