"It may change my understanding of the field": Understanding reading tools for scholars and professional readers

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Introduction

In 2001, the Public Knowledge Project at the University of British Columbia began work on a series of "reading tools" under the direction of John Willinsky. These tools were intended to provide readers of online scholarly journal articles with access to relevant related materials. The reading tools (originally called Research Support Tools) were incorporated into the open source software designed to manage and publish journals being developed by the Public Knowledge Project. In concept, the tools drew on the set of links that accompany the journal articles made available online by HighWire Press, PubMed, ScienceDirect, and other online journal portals. These links enable readers to find related studies and other papers by the authors, typically from within the portal's database.

In developing these tools, however, the goals of the Public Knowledge Project are somewhat broader than those of other journal sites. This follows directly from the project's interest in supporting open access to research and scholarship through the development of open source software systems. Open access, after all, implies public access to a body of work. The Public Knowledge Project's tools were intended not only to support scholars reading in their area of expertise, but also to support relatively inexperienced readers of research, including students, readers from other professions, and members of the public. For that reason, these tools were designed to draw on open access sources of scholarly work, as well as to connect the user to media, government, and other non-scholarly sources.

This study examines the use of these reading tools by thirteen humanities computing and graduate students. Our interview focus is on the degree to which, and the ways in which, such tools can contribute to the reading practices of domain-experts. In the course of the study, we found that researchers did not spend much time commenting on the reading tools. The current literature largely focuses on comprehension and perceived weaknesses of online reading environments. Understanding how users read and evaluate research materials, anticipating users' expectations of the reading tools and resources, and addressing user concerns about the availability of online material will lead to improvements in the design and features of online publishing.

Prior Studies

The reading practices of expert readers have been the focus of a number of prior studies. The results of this study speak to aspects of domain-expert reading that have not been previously addressed. In particular, our analysis has been motivated by Sam Wineburg's claim that "to understand the 'historical sense', we must study people as they engage in the practice of historical inquiry" [Wineburg 1991, 73]. The act of using the reading tools seemed to prompt participants to think about how they usually did things. During the course of our study, we found that participants spent much time reporting about their own reading practices as they did commenting on the reading tools. The current literature largely focuses on comprehension strategies at the level of the article rather than on how readers develop their understanding of a field by positioning articles and authors within that field. For example, in a study with close parallels to this one, Wyly et al. studied keen social science professors who,choosing a journal article to read, provided a commentary on what they felt was important about their approach to reading the work (Wyly et al. 1993). Readers drew upon a rich body of knowledge to ask them in comprehensive ways what sources they found that these readers draw on reading strategies that have critical methods and sources in place, which the tools were emulating with less-than-perfect accuracy or precision.

These readers did not as much, if not more, value these tools for their students in terms of helping them to evaluate an article and position it within a larger field. In sum, participants made it clear that reading tools could contribute to their reading of an academic article. The tools depend on how well the tools can assist in evaluating and placing an author's work within the larger field, (b) gaining a sense of that field from the online discussion of issues, (c) organizing the relevant research materials they encountered, and (d) taking full advantage of the library resources to which these readers have access.

Reading Tool Design

The reading tools developed by the Public Knowledge Project sit in a frame to the right of an article or a paper after it has been published using Open Journal Systems or Open Conference Systems. (The longer-term vision for the reading tools is that they would be able to serve other systems, as a browser plug-in or part of a library's portal.) The tools are organized into two sets. The top set of tools provides information about the article itself: its authors, indexing information, the sponsors of the journal, and links to other online versions. The bottom set of tools provides information about the journal article itself: its authors, indexing information, the sponsors of the journal, and links to other online versions.

As the amount of scholarly material published in digital form increases, there is growing pressure on content producers to identify the needs of expert readers and to create online tools that satisfy their requirements. Based on the results of a study conducted by the Public Knowledge Project and introduced at Digital Humanities 2006 (Siemens, Willinsky and Blake), continued and augmented since, this paper discusses the reactions of Humanities Computing scholars and graduate students to using a set of online reading tools. The results of our study reveal both the potential strengths and perceived weaknesses of online reading environments. Understanding how users read and evaluate research materials, anticipating users' expectations of the reading tools and resources, and addressing user concerns about the availability of online material will lead to improvements in the design and features of online publishing.

**Abstract**

As the amount of scholarly material published in digital form increases, there is growing pressure on content producers to identify the needs of expert readers and to create online tools that satisfy their requirements. Based on the results of a study conducted by the Public Knowledge Project and introduced at Digital Humanities 2006 (Siemens, Willinsky and Blake), continued and augmented since, this paper discusses the reactions of Humanities Computing scholars and graduate students to using a set of online reading tools. The results of our study reveal both the potential strengths and perceived weaknesses of online reading environments. Understanding how users read and evaluate research materials, anticipating users' expectations of the reading tools and resources, and addressing user concerns about the availability of online material will lead to improvements in the design and features of online publishing.

Figure 1. An article abstract with reading tools listed to the right.
Another crucial factor in delivering relevant materials to readers is the accuracy and scalability of the search terms used by the reading tools. The search terms, which appear when the reader clicks on a reading tool, are based on the first two words provided by the author of the article. Readers can edit the terms, as well as substitute search terms that focus on a specific aspect of the article or a single concept within it. Still, the author’s keywords provide a strong starting point not only for identifying the intended thrust and focus of the work. As might be expected, the search conducted by the Author’s Work tool uses the name of the author (or authors), while the Definition tool uses any word that the reader selects in the body of the article.

What these reading tools contribute to this new reading environment is an extension of the traditional knowledge of an article, they are also interested in checking those judgments against easily ascertained signs or markers of expertise in the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record.

Domain-Expert Readers Discuss Their Reading

For all the apprehensions about the status of online publication, readers expressed support for other web-based means of communication such as online forums where scholars can gather for informal exchanges and commentaries. In the humanities, such forums as H-Net (now Humanities txt) and PhilPapers (now Humanities Computing in the Humanities Computing Workshops) have become a critical part of the reading experience. Domain-expert readers commented favorably on this trend. While domain-expert readers are identified as “domains” in publishing, they have become more visible in evaluating the reading tools. A number of participants commented that, when they see other works by the author, “other people and disciplines who might be discussing works in the same area” (P10). One noted that “It’s often very difficult to find good secondary references especially in a field like Humanities where...” (P12). From this, readers can discover more about how materials have been included in the database. For example, the Abstrackts describes the data as a valuable resource for students looking for... and “It’s very important to be part of a community on the internet” (P6). Another participant noted that this tool provided access to a level of engaged and informed discourse that could not be found in the journals and described the value of... query activities when the reading tool is used.


Another participant noted that leaving a comment could “create a scholarly conversation” (P5). Six participants, however, were skeptical as to how often they would use such a feature. As one participant noted, “I would very rarely...” (P5). When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record. When using About the Author, a participant pointed out, “it can lend credibility to the author’s record.

This participant made a connection between comprehending an article and understanding a field. The reader commented that seeing “other works by the author,” as well as coming across “other people and disciplines who might be discussing works in the same area” (P12). The community nature of an online reading environment “gives you some insight on academic questions around the discipline that...” (P5). Finally, a participant... to search for information about... the level of expertise has been included in the database. For example, the Abstrackts describes the data as a valuable resource for students looking for... and “It’s very important to be part of a community on the internet” (P6). Another participant noted that this tool provided access to a level of engaged and informed discourse that could not be found in the journals and described the value of... query activities when the reading tool is used.
good dictionary, if I were looking up a word, I would go to the OED [Oxford English Dictionary] online which my university has access to” (P1). The same participant expressed similar concerns about the thesaurus tool (which should rightly be renamed the Encyclopedia tool as it was pointed out by P10), making it clear that the range of the reference materials made possible by library subscriptions was far superior to what was currently available through the reading tools. This shortcoming in the reading tools’ ability to take full advantage of these readers’ online resources is now in the process of being addressed.

Domain-Expert Readers Have Reading Methods

As domain-expert readers, participants exhibited techniques for augmenting and supporting the judgments they make about what they are reading. Some were already in the habit of turning to Google and Google Scholar. One asked, “rather than bothering with the metadata of the journal, I'd want to find out books on the same topic, why wouldn’t I just go to Google Scholar and be done with it?” (P1). A second participant put it plainly: “rather than use the Author’s Works tool I would have already done something simpler than going through all these search tools . . . I would have gone through to Google Scholar or the online catalogue or library” (P6). Finally, a third participant commented, “so it’s just giving me a different way of accessing things” (P2). The value of the tools for the domain-expert reader would seem particularly limited for those possessing more than a modicum of web savvy. Participants with less web experience were correspondingly less likely to compare the reading tools to those available through their library’s subscription: “There are much better tools than the ones that are available through the library” (P1) – four participants saw these tools as being of potential use to researchers in other fields. At least one participant recognized the value of these tools for the very difference it introduced: “I think that the materials they provide, or the notion of having media articles there to see what the kind of public or the press is saying is the area is useful because it gives us a very different perspective” (P2).

Domain-Expert Readers Generate Search Terms

Nine of the participants commented on the inadequacy of the provided search terms. These terms, you may recall, are normally drawn from the first two keywords the author provides for indexing the work in the process of submitting it to the journal, but in this case they were based on the metadata. Participants with the terms provided were either too general to be useful or were actually misleading. In addition, one of the distinguishing features of domain-expert readers reading in their own field is how they “automatically constructed their search terms even more significantly after reading the journal articles, thus it is to say that they are capable of generating very accurate keyword searches on their own [Alterroth 1993, 43].

One participant commented on the lack of focus in the search terms: “The words key both in the search thesaurus and the metadata material I found almost too broad to be of assistance with this particular article” (P2). Another observed that “viewing the metadata terms is not easy to ‘explain why most of the tools later on failed’ because it’s improperly categorized” (P1). This participant added, “the direct link [to Google from the OJS] isn’t so useful because the search terms in this case probably wouldn’t be the ones I’d choose to use anyway” (P1). What needs to be noted here is that readers, before clicking “search” with any of the reading tools, are able to edit, delete or add search terms. Apart from overlooking some of the features of the tools, one participant did go on to suggest that we should incorpporate metadata automatically generated from the words used in the article itself. Another felt it was the responsibility of professional classifiers to read each article and determine categories and key words which, in order to greatly improve the accuracy of the reading tools, without question, while adding to the expense of running a journal.

Certainly, there is more that can be done to improve the indexing of the articles, and thus the precision of the searches. The journals’ editors are able to provide authors with examples of index terms specific to their field, and they have the option of including a link to a thesaurus (e.g., ERIC Thesaurus in education) or classification scheme (e.g., Mathematics Subject Classification) that can further guide authors. It is in the authors’ self-interest to learn more about how to accurately index their work. Another participant commented on “familiarity” lagging – used with blogs and social networking websites – in which readers can collaboratively suggest indexing terms for a work. These indexing terms can be used to create a word cloud which reflects the frequency with which each tag is used. Readers using the tools would select tags or indexing terms from the cloud as their search terms.

Domain-Expert Readers Access Reference Resources

One feature of reading research online projects that the article did not yet have in place when this study was conducted was found to be fairly effective by researchers reading journal articles. Researchers check the works the authors references not only to see if the reference has been quoted and otherwise treated fairly, but because the references are to an article that one of the best sources of additional information on the topic. The reading tools operate independently of the article’s references in the sense that the reading tools find related materials that are available after the article was published and that are potentially from a greater variety of perspectives on a topic than the list of references that an author assembles in an article.

Noneetheless, one participant in this study pointed out the value of having similar sorts of links from the reference in the article to the article referenced in the context of teaching a class on the origional article: “If you have the text and the author is comparing it to another . . . you might zip over to have a look at the other text where you want to discuss that one as well” (P14).

Domain-Expert Readers Organize their Readings

What became very clear from our interviews with the participants is that the tools offering them the best of what was available in an open access format for their field fell short of what they were used to, even in online environments. As faculty members and graduate students at research universities, they are able to log into their library’s online resources from their offices and their homes, not to mention hotel rooms and airports. As a result, some participants compared the databases offered by the reading tools to those of their library’s subscription: “There are much better tools than the ones that are included [in the reading tools]. Now, if this included the MLA, then sure it would be useful, it’s just that right now, the tools that are there aren’t the ones that would give a complete listing of his work “ (P1). One participant summed up the reading tool’s open access limits this way: “I think it’s an insurmountable problem . . . until this stuff really becomes free, because everything that’s free is incomplete . . . and i care about complete” (P1). Dissertation Abstracts International, Oxford University Digital Library, and Project Muse were among the other subscription services that the participants felt were sorely lacking from the reading tools.

Instead of viewing the article’s links as a reference section, one participant saw the list of links as a “Public Library as the only resource one could use to read other articles and browse through the journal’s database” (P6). Participants were equally disappointed with the Author’s Bio section in which many readers were disappointed when the keywords associated with the author were not included.

However, there is a solution to this problem. To address this obvious and substantial shortcoming for domain-expert readers, the project is developing an OpenURL framework for the tools. This is what Google Scholar has done, enabling faculty members and students to log into their library’s Google Scholar, which then, with each search, identifies the items found that are in the library. It will take an extra step, but then do allows logging into one’s library from a remote location. The result will be, to use the words of one participant, “a comprehensive list [with] an indication of which items I can get at my desktop, and which ones i actually have to go to the library for” (P1).

Domain-Expert Readers Care About Access

At least a few of the participants showed great sensitivity to the access question. They were interested in providing a way for more than just scholars and students to be able to take advantage of these scholarly resources. That is, they were supporters of the open access movement in scholarly publishing: “What I’d hope [is] that you could get academisa hacked into the system so they’d publish copyright free articles under this system so that [some] information will be free” (P4).

Another participant drew the distinction of the university’s obligation to the larger public, within the economic reality of publishing: “I’m very sensitive to the notion that publishing, even electronically, can cost money . . . but we’re also working in a university environment where we’re doing things that are usually made available to the public . . . the fact that i couldn’t get this for free anywhere is at all problematic to me, philosophically speaking” (P5). This participant also stated on using the fact that “I think most of us have a preference for stuff that’s open . . . don’t object to having it on line and if people do want to pay I guess they ought to be able to buy it at the same time I would hate to encourage this sort of thing” (P5). There were also participants who responded negatively to the Pay-Per-View tool, which was the open access tool included among the reading tools. “I’d probably have to be pretty desperate to use the [Pay-Per-View tool] . . . even if we click on it, we don’t seem to be getting very much” (P5).

Domain-Expert Readers Organize their Readings

As this was the participants’ first experience with the reading tools and there were limits to how thoroughly the use of the tools could be reasonably explained to them, there were times when what the tools could do were misunderstood. Still, these misunderstandings provide insights into domain-expert readers’ reading habits:

I have my own way of organizing my information on my own and one of the things would be to bookmark something . . . so i lose my ability to bookmark, because i’m within this window that’s not giving me those features that I have control of a lot of material that I would want to be able to come back to” (P1).

The ability to bookmark the databases provided by the reading tools, as well as the individual articles found within any one database, could have been done at any point by using the browser’s Bookmark feature, which of course operates independently of the reading tools. Still, this participant’s interest in archiving and organizing the results of reading tool searches does suggest that more could be done to facilitate this process. In an earlier version of the reading tools, readers could establish a personal online database in which an article’s metadata was included, whether readers were reading an online article or searching for references not only to see if the reference has been quoted and otherwise treated fairly, but because the references to an article provide one of the best sources of additional information on the topic. The reading tools operate independently of the article’s references in the sense that the reading tools find related materials that are available after the article was published and that are potentially from a greater variety of perspectives on a topic than the list of references that an author assembles in an article.

In Sum, Domain-Expert Readers Map Meaning and Value

What this study makes clear in relation to earlier studies of the cognitive processes that domain-expert readers apply to reading within their domain is that this reading process includes positioning and assessing the author and his or her ideas in relation to the larger reader’s flow of the information within the article, while the mapping and judging those ideas in relation to work with which they are already familiar and new work they have encountered through the reading tools. The judgment side of this process relies on a finely tuned measures of hierarchial ranking. These measures are continuously recalibrated as the reader evaluates the author’s readers, the project is developing an OpenURL framework for the tools. This is what Google Scholar has done, enabling faculty members and students to log into their library’s Google Scholar, which then, with each search, identifies the items found that are in the library. It will take an extra step, but then do allows logging into one’s library from a remote location. The result will be, to use the words of one participant, “a comprehensive list [with] an indication of which items I can get at my desktop, and which ones i actually have to go to the library for” (P1)

Conclusions

We believe that with this new publishing medium comes an opportunity and an obligation. That is, if稿者们对数字期刊的未来在与现实研究环境之间的转换中更具有效率，那么给予作者的数字工具也应成为对研究者更具价值的工具。
one participant in the study who was also imagining the possibilities for an improved reading environment. It took the form, for him, of a "highly developed information management forum that would incorporate a lot of these tools, but would really be towards... a kind of dialogue, a collective development of knowledge" (P4). Reading often leads to the formation of communities (which is one way of very briefly encapsulating the history of the university). Changes in reading habits and practices, on this scale, are not going to process in a simple or straightforward way, yet they are also not going to be dictated by website designs or research results.

Appendix 1

This appendix contains the full text of a report on the results of a study funded by the Canadian Social Sciences and Humanities Research Council, entitled A Study of Professional Reading Tools for Computing Humanists.

Executive Summary: A great deal of the emerging research literature concerned with online information resources focuses on information retrieval, which is concerned with the use of search engines to locate desired information. Far less attention has been paid to how the found materials are read and how that critical engagement can be enhanced in online reading environments. This paper reports on a study examining the question of whether a set of well-designed reading tools can assist humanities computing scholars in comprehending, evaluating and utilizing the research literature in their area. Thirteen computing humanities were interviewed regarding their experiences using the reading tools. They were asked which tools, if any, and to what degree, these tools contribute to their comprehension, evaluation, and interest in utilizing the work they are reading. Responses varied widely among users but it was found that overall, the reading tools had the potential to lead to a variety of useful additional materials that would help users come to a better understanding of a particular article. The reading tools were deemed to be an exceptionally good resource for students or beginners in the field. Participants also identified several issues with the tools themselves and the web as a whole that affect the online reading and research experience.

Downloaded PDF (864 pages).

Appendix 2

This appendix contains the original interview data on which this article is based. The source files are provided both as a compressed archive containing the original NVivo files, and also as plain text.

Download the interviews: as plain text, as a zip archive, as a tar archive.

Notes

1. Additional studies are being conducted within the Public Knowledge Project on the value of such tools for readers who are not domain experts, e.g., Twomey, Willinsky and Quint-Rapoport, and Willinsky.
2. Those working in the humanities are less likely than those in the sciences to track the ISI Web of Science citation index, which ranks journals within fields by their Impact Factor, based on the average number of times an article is cited across two years of a journal’s publication. Many in the sciences advertise their impact factor, with authors closely attending to this ranking process, in the belief that it will affect the take-up of their work.
3. Project Muse is a division of the Johns Hopkins University Press in collaboration with The Milton S. Eisenhower Library and currently offers over “300 high quality humanities, arts, and social sciences journals from 60 scholarly publishers,” according to its website, http://muse.jhu.edu.
4. Real-time searching is an issue of concern among those in the sciences, and this is why many researchers work with tools that allow them to keep track of all of the publications in a field, but this is not something that applies to those reading outside of their domain-expertise, we have found in other studies that a knowledge of the author also plays its part. For example, the author’s name is happily expressive of his talents."
5. The Humanities pose something of a challenge in terms of comprehensive searching, as the field lacks a “PubHum,” comparable to PubMed, as a single comprehensive database for searching the life sciences.
6. While this evaluative cataloging of people and ideas is not something that applies to those reading outside of their domain-expertise, we have found in other studies that a knowledge of the author also plays its part. For example, the author’s name is happily expressive of his talents.
7. Project Muse is a division of the Johns Hopkins University Press in collaboration with The Milton S. Eisenhower Library and currently offers over “300 high quality humanities, arts, and social sciences journals from 60 scholarly publishers,” according to its website, http://muse.jhu.edu.
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