

# University of Alberta

The Current State of Scholarly Editions

by

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## Abstract

This thesis examines and compares printed and digital scholarly editions from three separate but complementary perspectives. The overarching aim is to increase the understanding of the relative merits of printed and digital scholarly editions. The perspectives employed include a theoretical one, in which scholarly editions are situated within the context of media theory; a comparative one, in which particular printed and digital editions are compared with each other; and another comparative one, in which particular digital editions are compared with each other.

The conclusion is that although digital scholarly editions offer new and exciting opportunities for research, printed ones also have advantages and are still useful for scholars.

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## Introduction

### Research Problem

The goal of my thesis will be to explore the emerging phenomenon of digital scholarly editions from a variety of perspectives that have not seen significant representation in the relevant literature to date. These perspectives will combine to provide a more comprehensive understanding of digital scholarly editions than has so far been made available by other writers on the subject. The research questions tying the work together as a whole will be the following:

- What are the advantages and disadvantages of digital scholarly editions as compared to printed ones?
- On the whole, are digital scholarly editions really superior to printed ones?

The thesis will be divided into three main chapters, as well as an introduction and a conclusion. Each of the three chapters will have its own methodology and sample, but will contribute to answering the main research questions in different ways. In the first main chapter, a theoretical examination of digital scholarly editions will be undertaken. In the second, a comparison of digital and printed scholarly editions will be made. In the third, digital scholarly editions will be compared with each other and analyzed on their own merits.

Reflections on the results of these chapters will then be given, and conclusions will be developed that take into account the findings of each. Findings of this thesis are likely to be of use to those involved in creating either digital or printed scholarly editions, as well as to other interested parties, such as members of the humanities computing and library and information studies communities.

### **The Importance of Scholarly Editions**

The importance of scholarly editions for scholars in the humanities cannot be underestimated. Without them, scholars would find themselves in the unenviable position of beginning every study of any work from scratch, without the benefit of previous scholarship. They would have to seek out in libraries and archives the various versions of a given work, as well as their associated strands of commentary and analysis. Linking the materials together into a workable system amenable to study would essentially entail that every scholar first do some of the work of an editor of a scholarly edition in order to study the material in question. Such an approach would prevent newer scholarship from benefitting from older scholarship, which may be considerable. It would also require that scholars in some respects reinvent the wheel, either creating new work unrelated to any that has already been done, or creating a kind of ad-hoc scholarly edition composed of whatever material could be located before beginning to work. The result would be a reduction in the quality and complexity of the resulting study, and a massive waste of time and labour. It is for reasons such as these that Jerome McGann

has gone so far as to remark that “scholarly editions comprise the most fundamental tools in literary studies” (McGann 55).

## Definition

Despite the manifest importance of scholarly editions to the humanities, there exist almost as many definitions of scholarly editions as there are scholars on the subject. The term typically cannot be found in dictionaries, including the OED, and even the authoritative “Guidelines for Editors of Scholarly Editions,” produced by the Modern Language Association, lacks a concise definition, stating simply that “The scholarly edition's basic task is to present a reliable text: scholarly editions make clear what they promise and keep their promises” (Modern Language Association). Some of the ways that the term “scholarly edition” has been defined by scholars include the following: “the establishment of a text on explicitly stated principles and by someone with specialized knowledge about textual scholarship and the writer or writers involved” (Price); “a reliable text of a historical work [that allows] readers to see or feel or sense the historical materialities and contexts of the work” (Shillingsburg 22); and “an edition that is reliable and useful for scholarly purposes” (Hjørland). For the purposes of this thesis, I will use Hjørland’s definition because it allows the inclusion of different kinds of editions, including critical editions, facsimile editions, and others. As all of these types of editions are useful to scholars, and all are undergoing major transformations in their move to the Web, an

inclusive definition allows for a more comprehensive view of how scholarly editions are changing.

A “digital” scholarly edition is one that has been created specifically for electronic publication, whether on CD-ROM, the Web, or by other means. Therefore, a PDF of a printed scholarly edition does not count as a digital scholarly edition by this definition, since it has not been created primarily for digital publication.

### **Historical Context**

Before delving into theory, it will be useful to provide some historical context to our discussion. For many years, writers have been predicting the imminent obsolescence of books. As early as 1945, Vannevar Bush, known “among librarians as the ‘godfather’ of the interdisciplinary field of ‘information sciences’” (Zachary 75), dreamed of a day when microfilm would replace books, and “a library of a million volumes could be compressed into one end of a desk” (Bush 2). Codes would be used to automatically retrieve indexes, books, or records “with far greater facility than if [they] were taken from a shelf” (Bush 6). Twenty years later, pioneering computer scientist J. C. R. Licklider argued that the medium of the book was one of humanity’s biggest obstacles to human progress. As he writes in his *Libraries of the Future*, “the difficulty of separating the information in books from the pages, and the absence, in books, of active processors, are the roots of the most serious shortcomings of our present system for interacting with the body of recorded knowledge” (Licklider 6).

Some have objected that this kind of focus on functionality in prognostications regarding the future of the codex fails to take into account the affection that many people possess for the materiality of books.

Representative of this view is Robert Darnton, who argues in his *Case for Books: Past, Present, and Future* that the size, smell, and feel of printed books cannot be replicated in the digital environment, and that “no computer screen gives satisfaction like the printed page” (40).

However, arguments for the survival of books that are based solely on aesthetic qualities seem less applicable in the case of scholarly editions, which are ostensibly created primarily as analytical aids for scholars, rather than as objects of sensual gratification. Indeed, Hans Walter Gabler goes so far as to claim that “the digital medium will be the native medium of the scholarly edition of the future” and that printed scholarly editions will cease to be produced (Gabler).

Peter Robinson goes one step further than Gabler, arguing not only that digital scholarly editions will make printed ones obsolete in the future, but that they should already have done so, asking rhetorically “Who would publish a scholarly edition in print, now that the digital medium exists?” and answering despairingly that “the answer is almost everyone. With a few exceptions, almost every scholarly edition published in the last decade has been published in print, and in print only” (146).

Statements like these are striking, but contentious. In the following chapters, they will be investigated and evaluated by means of a variety of methods. Now we turn to a discussion of theory.

## Chapter 1: Theoretical Perspectives

In “The Rationale of Hypertext,” Jerome McGann argues that computerization is fundamentally altering the nature of scholarly editions: “The change from paper-based text to electronic text is one of those elementary shifts – like the change from manuscript to print – that is so revolutionary we can only glimpse at this point what it entails” (28). Furthermore, he characterizes this shift as being overwhelmingly positive in that it makes scholarly editions much more powerful in a number of ways: “The computerized edition can store vastly greater quantities of documentary materials, and it can be built to organize, access, and analyze those materials not only more quickly and easily, but at depths no paper-based edition could hope to achieve” (McGann 28). The problem with printed scholarly editions, according to McGann, is that the format of the instrument used to study is identical to that of the object being studied. In order to gain a proper perspective on material produced in book-form, we must use a non-book:

When we use books to study books, or hard copy texts to analyze other hard copy texts, the scale of the tools seriously limits the possible results. In studying the physical world, for example, it makes a great difference if the level of the analysis is experiential (direct) or mathematical (abstract). In a similar way, electronic tools in literary studies don't simply provide a new point of view on the materials, they lift one's general level of attention to a higher order.” (McGann)

Rather than books, McGann argues that computers are more appropriate hosts for scholarly editions: “computerization for the first time releases the logical categories of traditional critical editing to function at more optimal levels” (McGann, “The Rationale of Hyper Text” 15). Gabler echoes this sentiment years later, writing that “the otherness of the digital, as opposed to the material, medium will enable digital scholarly editions to reach out beyond the confines of the customary scholarly editions in book form” (Gabler).

Other writers generally concur with McGann’s assessment. As far back as 1986 Peter L. Shillingsburg exclaimed in *Scholarly Editing in the Computer Age* that “the benefits to me in my own work... were such that I have no hesitation in stating that only madness would make me proceed without the computer” (Shillingsburg, *Scholarly Editing in the Computer Age* 134). Shillingsburg was at that time referring to production processes such as collation and typesetting, and omitted any mention of scholarly editions produced solely for the screen. This provides a stark contrast to a work he published two decades later in 2006 called *From Gutenberg to Google: Electronic Representations of Literary Texts*, in which he states bluntly that “electronic scholarly editions either already can, or promise soon to be able to, offer to both editors and edition users considerably more than was possible in print editions” (Shillingsburg, *From Gutenberg to Google* 97). Similarly, Eugene William Lyman makes the claim that “The electronic medium... holds the hope of the scholarly edition's fullest realization”



(Lyman iii); John Lavagnino claims that an electronic edition “can say more than the printed book does” (Lavagnino); and Susan Hockey points out that the electronic medium can add value to an edition (Hockey).

Such unanimous approval for digital scholarly editions seems quite striking, especially in light of the decidedly more nuanced approach of the scholarly community with regard to new media in general. Although some exceptions do exist, such as Ted Nelson’s statement that “computer screens can make people happier, smarter, and better able to cope with the copious problems of tomorrow” (DM74), theoretical discussions of new media tend almost universally to avoid statements to the effect that new media are simply “better” than older media.

What are we to make of the discrepancy between attitudes towards new media in general, and towards digital scholarly editions in particular? Part of the reason for the divide may be simply that many of the people writing about the rather specialized subject of digital scholarly editions are either directly involved in creating them, members of the humanities computing/digital humanities community, or both. Each of these groups tends to hold highly positive views of technology, not to mention having vested interests in seeing their projects and those of others in their community succeed. However, another factor may be that scholarly editions have not been subjected to the kind of extended theoretical analysis with other forms of new media have been examined. Perhaps if they were, more subtle evaluations could be accomplished, ones that do not only serve only to

expose their superiority over their predecessors, but instead attempt to evaluate them in more sophisticated ways.

With this possibility in mind, the objective of this chapter will be to perform an examination of digital scholarly editions with reference to theories of new media laid out in three well-known and widely cited theoretical discussions: Marshall McLuhan's *Understanding Media: The Extensions of Man*, Lev Manovich's *The Language of New Media*, and Jay David Bolter and Richard Grusin's *Remediation: Understanding New Media*.

### **Marshall McLuhan's *Understanding Media: The Extensions of Man***

In any thoroughgoing study, a good place to start is at the beginning; in the case of new media forms, a plausible beginning is Marshall McLuhan, who according to Matthew G. Kirschenbaum "all but invented media studies with *Understanding Media*" (Kirschenbaum). Eugene William Lyman would disagree with using McLuhan to begin a study of digital scholarly editions. He writes in his dissertation *Assistive Potencies: Reconfiguring the scholarly edition in an electronic setting* that McLuhan's dictum that "the medium is the message" led to the "naïve [assumption] made early on in the porting of texts into a digital environment... that somehow the move into electronic format would work a great change on texts, endowing them with capacities that they lacked in print" (Lyman 30–31). He argues that such a view is misguided, since "Even granting that this may be true in some limited way, it does not follow that porting a text into an electronic environment will endow it with all of the properties that it could possess if concerted effort were expended to

arrange for them” (Lyman 31). Lyman’s criticism is based on a characterization of McLuhan’s maxim “the medium is the message” as implying that different examples of a particular medium are functionally equivalent, and that therefore a uniformity of features should prevail with regard to every digital representation of a text, be it plain text, PDF, or a sophisticated digital scholarly edition such as a document in the *Perseus Digital Library*.

In one way, this seems like a fair criticism; McLuhan seems quite rigid in his characterization of media as being high or low definition for example, claiming that “a photograph is, visually, high definition” (McLuhan 22) and making no allowance for the possibility that it might display unrecognizable objects, be blurry, be too dark or too bright, or have been tampered with in some way. In any of these cases, the photograph will retain its identity as a photograph, but will not possess the characteristic of high definition that McLuhan attributes to photographs.

On the other hand, one might choose to interpret McLuhan more charitably, and construe his remarks about photographs as pertaining to photographs *as a class*, rather than to every instance of that class. Therefore, although photographs are in general high definition, defective or otherwise aberrant examples of photographs may not be. Similarly, despite the fact that there exists a great deal of variation in the particular affordances offered by various digital formats, remarks to the effect that the digital medium will “work a great change on texts, endowing them with capacities they lacked in

print” seem demonstrably true, whether we are talking about plain text, PDF, or sophisticated digital scholarly editions. For example, the simple fact that digital documents can be displayed at will on a screen, and then equally easily removed from view, makes them markedly different from their paper counterparts, which remain in place once written. The nature and degree of the changes inherent in diverse digital formats, and even across individual instances of each format (such as between a simple digital edition versus a more complex one), will of course differ; however, the fact remains that the digital environment, as a class, does possess certain common characteristics that diverge quite radically from those of the printed environment.

Acceptance of this fact allows McLuhan’s maxim to retain its applicability, but still leaves room for Lyman’s observation that unique and innovative properties require concerted effort to be produced, and are not simply automatic gifts of the digital medium.

Once it is admitted that McLuhan’s maxim “the medium is the message” retains its significance in the context of digital scholarly editions, then the next step is to determine its particular implications. McLuhan explains his maxim as the idea that “the personal and social consequences of any medium – that is, of any extension of ourselves – result from the new scale that is introduced into our affairs by each extension of ourselves, or by any new technology” (7). It is difficult to speak of the “personal and social consequences” of digital scholarly editions, since they exist almost totally within the relatively impersonal and narrow domain of scholarly work, and

outside of the experience of the general public. In fact, this observation points to a major characteristic of McLuhan's theories: in his attempt to find all-encompassing and universal principles and laws, he takes as his subject matter mainly *popular* media, largely ignoring specialized forms such as scholarly editions. However, if his theories really can be said to apply universally, then they should apply to scholarly editions as well.

Since "the content of any medium is always another medium" (McLuhan 8), in order to explore the McLuhanian message of digital scholarly editions, we must begin by explaining their composition. The most obvious content of a digital scholarly edition is the work that it showcases; in most cases, this is a printed book, a manuscript, or some other physical instantiation of a work. This work is often represented as a facsimile (i.e., as a McLuhanian photograph) as well as being transcribed (i.e. as the printed word). There are also usually mechanisms for searching, browsing, and performing analytical operations on the text, and there may even be multimedia elements such as video (i.e. television) or audio (i.e. the phonograph). The result is a heavily hybridized medium, one that combines a variety of media to construct a new kind of representation with a fundamentally different kind of message than anything that has come before. McLuhan describes this situation as follows: "The hybrid or the meeting of two media is a moment of truth and revelation from which new form is born.... The moment of the meeting of media is a moment of freedom and

release from the ordinary trance and numbness imposed by them on our senses” (55).

This kind of release from trance and numbness may seem rather dramatic in the context of digital scholarly editions, although it can be believably interpreted as an amplified echo of sentiments espoused by the likes of McGann, Lavagnino, Hockey, Shillingsburg, and Lyman to the effect that digital scholarly editions are more powerful than printed ones, and enable editors to say and do more.

One of the features of some digital scholarly editions that are touted as making digital editions much more powerful is the ability for users to actively collaborate with the editors and with each other by sharing knowledge and adding annotations. The Online Chopin Variorum Edition, for example, provides users with the ability to make private or public annotations to bars of music. Because of this feature, it is advertised as “an altogether new type of ‘dynamic edition” (Rink et al., “Online Chopin Variorum Edition: Project Description”), and that it can “be seen as a dynamic ‘network’ rather than a fixed document” (Rink et al., “Online Chopin Variorum Edition: Report”). Peter Shillingsburg believes that public annotation will be central to future digital scholarly editions, which will be “constructed modularly and contributed to by ‘a village’ of scholars” (Shillingsburg 97). This co-operative view of the future would be very familiar to McLuhan, who writes that unlike the alphabet, which “detrribalized” people, turning them from a cohesive unit into an

“agglomeration of individuals,” the electric future reverses this trend, and is instead about *retribalization*: “Electric writing and speed pour upon him, instantaneously and continuously, the concerns of all other men. He becomes tribal once more. The human family becomes one tribe again” (172).

Shillingsburg’s notion of a “village of scholars” finds a direct parallel in McLuhan’s notion of a “global village,” the inevitable product of *retribalization*: “With instant electric technology, the globe itself can never again be more than a village” (McLuhan 343). Although it is true that Shillingsburg’s village is substantially smaller than McLuhan’s, the metaphor works well in both cases, and carries similar implications for the future of human relationships.

The result of the various changes wrought by the move from printed to digital scholarly editions is that the genre of the scholarly edition has been irreversibly altered. Just as “radio changed the form of the news story” (McLuhan 53), the digital environment has changed the form of the scholarly edition. One change of form can be seen in the inclusion of multimedia in digital scholarly editions; whereas in printed books editors had “to reduce all forms of expression as much as possible to the single descriptive and narrative plane of the printed word” (McLuhan 54), in digital editions editors are much freer, and stand able to “play back the materials of the natural world” (McLuhan 59) without relying so much on textual description and interpretation. A more direct form of apprehension of the original work then becomes available, one that is less subject to the biases of editors.

Another way that the form of the scholarly edition changes from print to the web is by the inclusion of hypertext. Hypertext allows users to jump around to points of interest within and between works, allowing less linear methods of reading. McLuhan anticipates this change, writing that “Today in the electric age we feel as free to invent nonlinear logics as we do to make non-Euclidean geometries” (85). The effect of such nonlinear logics is to counter the prevalent mechanical modes of thinking in terms of cause and effect and sequence and succession, and replace them with more holistic apprehensions of objects and ideas (McLuhan 86).

With these observations on the effects that a turn to digital scholarly editions may have on the message and the external form of scholarly editions in hand, we can now turn to their internal structure; a look at Lev Manovich may help us in this.

### ***Lev Manovich's The Language of New Media***

Like McLuhan's *Understanding Media*, Lev Manovich's *The Language of New Media* combines historical and theoretical approaches to the study of new media. Manovich himself acknowledges a debt to McLuhan, writing that “New media calls for a new stage in media theory whose beginnings can be traced back to the revolutionary works of Robert Innis and Marshall McLuhan of the 1950s” (48). However, Manovich's approach differs from McLuhan's in that rather than comparing new media to older media and evaluating them as if they were different types of a single category, new media are examined on their own terms: “From media studies, we move to



something that can be called 'software studies' – from media theory to software theory” (Manovich 48). The fundamental difference between “old media” and “new media” is that at base new media are data, and not really media at all; “That the data represents pixels and that this device happened to be an output screen is besides the point.... New media may look like media, but this is only the surface” (Manovich 48).

In the context of digital scholarly editions, the shift from media studies to software studies means that a whole new approach is required in order to perform a proper analysis. Rather than applying the same categories and concepts from the print world, digital scholarly editions should be seen as something new and fundamentally different. It is this kind of insight that prompts Shillingsburg to claim that the move from print to the web necessitates an entirely new paradigm in thinking about scholarly editions, and that in fact the term “knowledge site” is more appropriate when referring to scholarly editions of the future (Shillingsburg 81).

Manovich does not speak specifically about scholarly editions per se in *The Language of New Media*, although he does discuss “cultural interfaces,” which he defines as “human-computer-culture interface[s] – the ways in which computers present and allow us to interact with cultural data” (70). Cultural interfaces include anything from websites to video games, and would also encompass scholarly editions. In fact, Manovich argues that cultural interfaces have grown so popular that computers can now be said to mediate not only certain cultural forms, but all culture (64). Furthermore, the

computer interface is not transparent or neutral, but determines how users think about the media objects accessed through them (Manovich 65). Therefore, to alter an interface to a work is to alter the work itself (Manovich 67). Digital and printed scholarly editions of the works of Shakespeare, for example, should according to this view be said to constitute different works. This idea, if accepted, has important implications for the design of digital scholarly editions; no longer do they simply provide different levels of added value to a work, but actually act to rewrite it in various ways. As to the particular ways in which digital scholarly editions are different from printed ones, Manovich explains them in terms of an examination of “the language” of cultural interfaces, which is composed of elements of three familiar cultural forms: the printed word, the general-purpose human-computer interface (HCI), and cinema (71).

Since scholarly editions are primarily textual, the first of these forms is arguably the most important. Manovich contends that whereas the printed word relies on the interface of the page, in the online environment the page becomes “fluid and unstable” (75). Manovich here echoes Bolter’s earlier contention that “electronic writing is fluid and dynamic to a greater degree than previous technologies” (Bolter 8). With respect to digital scholarly editions, this means that an electronic edition may never really be “complete,” and can be subject to updates and revisions almost indefinitely. And in fact, a look at some actual examples of digital scholarly editions reveals this to be the case; editions like the Perseus Digital Library, the Walt

Whitman Archive, and the Internet Shakespeare Editions have been in existence for many years, and have seen many updates over that time. In contrast to printed editions, which are produced as discrete publications, specific versions of these editions as they appeared at particular stages of their history can be difficult to find; users interested in an older version of a digital edition may have to be satisfied with searching out cached versions available in the Internet Archive's Wayback Machine, which in almost all cases lacks complete records of archived scholarly editions.

In its transition to the screen, one of the most important changes to the printed word involves the introduction of hypertext. According to Manovich, the ease with which a reader can be led by hyperlinks to places outside of a text has meant the decline of rhetoric and the triumph of metonymy (77). Hyperlinks also work against hierarchy, reducing "new media culture [to] an infinite flat surface where individual texts are placed in no particular order" (Manovich 77). This flattening is reinforced by random-access memory, which allows any part of the work to be accessed at once, thus allowing the user to bypass narrative and rhetoric (Manovich 77). Instead, "cultural interfaces... bombard the user with all the data at once" (Manovich 78). Such flattening is clearly present in digital scholarly editions, to the point that they are often labelled "archives" rather than "editions." Indeed, Manovich himself points out that "multimedia works that have 'cultural content' appear to particularly favor the database form" (220). In terms of navigation in a database-like digital edition, tables of contents are

replaced by search engines or lists of hypertext based on various criteria, both of which allow users to jump anywhere within a work quickly and easily. Hypertext may be used within a text as well to lead the user to associated media, or to other places within the edition. The result of all this hypertext is an edition that lends itself more to non-sequential browsing than to extended reading. Peter Robinson takes a further step and argues with Manovich that the archive model is characterized not only by a different style of reading, but by a different kind of content as well; namely, a lack of editorial interpretation and an “impersonal presentation” (Robinson).

As to HCI, the third of Manovich’s familiar cultural forms, his observations also seem quite applicable to digital scholarly editions; much use is made in these editions of traditional HCI features enumerated by Manovich, such as “scrollable windows, windows containing text and other data types, hierarchical menus, dialogue boxes, and command-line input” (89). Despite the advantages of features of traditional HCI, there are three problems with their use in digital scholarly editions. First, Lyman argues that this use of standard WIMP (windows, icons, menu, pointer) features in digital scholarly editions is inefficient and creates unnecessary work for the user. Forcing users to resize and align windows, scroll, and perform other such operations is inefficient, and “the unfortunate result is [that tasks] that might have been done once... now must be undertaken each and every time a text is viewed” (Lyman 29). Second, as with cultural interfaces in general, digital scholarly editions “attempt to mediate between... two fundamentally

different and ultimately incompatible approaches,” allowing users to perform the detailed operations familiar to users of HCI, while at the same time trying to retain some semblance to cultural objects that are traditionally unchangeable and wholly determined by the author (Manovich 90). Essentially, HCI elements do not resemble a book, so if the goal is to accurately represent a book by means of a computer screen, some inherent difficulties will arise. A final problem is that HCI tries to maintain consistency between applications, whereas culture emphasizes originality (Manovich 91). Although ease of use requires standardized features, such features detract from the artistry and uniqueness of an edition.

Cinema is the last of Manovich’s cultural forms that influence the language of cultural interfaces, and is arguably not very important with regard to scholarly editions; in fact, given the relative scarcity of video in scholarly editions, it is difficult to apply to them Manovich’s claim that “rather than being merely one cultural language among others, cinema is now becoming the cultural interface, a toolbox for all cultural communication, overtaking the printed word” (86). This may be an instance in which the rarefied field of scholarly editions will always go against the grain of popular culture, as text-based scholarly editions do not appear to be in any danger of being overtaken by video-based ones, which appear thus far to be non-existent. However, although the form of the scholarly edition is not changing to this degree, a number of noteworthy insights can be had by studying the aesthetic instantiation of the scholarly edition on the Web.

Bolter and Grusin's *Remediation: Understanding New Media* may be able to help us to make sense of digital scholarly editions from this aesthetic standpoint.

### **Jay David Bolter and Richard Grusin's *Remediation: Understanding New Media***

Like Manovich's *Language of New Media*, Bolter and Grusin's *Remediation: Understanding New Media* also builds off McLuhan, although it does so in a very different way. Rather than taking a structural view of media and attempting to decipher its "language," as Manovich does, Bolter and Grusin opt for a more aesthetically oriented approach, focussing on the way new media looks, and the kinds of impact it has on people. Thus they define their central concept of remediation in terms of "transparent immediacy" and "hypermediacy," which essentially refer to levels of noticeability of the interface. The insights they develop using this view are quite useful in the study of digital scholarly editions, since a key component to a successful edition is the provision of an interface that balances the need to openly and faithfully represent a work with the need to provide information and control to the user.

Remediation, as defined by Bolter and Grusin, is "the formal logic by which new media refashion prior media forms" (273). Bolter and Grusin believe this principle to be universally applicable, at least with respect to the current historical moment: "all mediation is remediation.... Our culture conceives of each medium or constellation of media as it responds to,

redeploys, competes with, and reforms other media” (Bolter and Grusin 55). Since it is universally applicable, it obviously makes sense to evaluate digital scholarly editions in terms of remediation. However, that is not the end of the story. A brief consideration of the matter is enough to reveal that remediation is doubly applicable in the case of digital scholarly editions: not only do digital scholarly editions remediate printed ones, but they also remediate whatever work is being represented in those printed editions.

As to the motivation for remediation, Bolter and Grusin argue that “each new medium is justified because it fills a lack or repairs a fault in its predecessor, because it fulfills the unkept promise of an older medium” (60). This rhetoric of digital improvement on the printed medium is strongly evident in the writing of McGann, Lyman, Shillingsburg, and others, as we saw above. Faults that digital scholarly editions are seen as repairing include a lack of space, the inability to include multimedia, and inefficient means of navigation and analysis. Lyman also argues that the quality of reliability, touted as the most essential characteristic of scholarly editions by a number of writers on the subject (e.g. Lyman 8; Hjørland; Modern Language Association), is increased in digital scholarly editions. This increase in reliability can be attributed to the provision of advanced search capabilities that allow users to question texts in ways unanticipated by the editors, allowing for “unmediated inspection” and the ability to seek out and test biases that might be present within the text (Lyman 156).

Lyman's idea here with regard to digital scholarly editions is a perfect example of Bolter and Grusin's more general observation that the invention of any device involves the "claim that it [is] better in some way at achieving the real or the authentic" (Bolter and Grusin 65). However, the real or authentic does not remain static. According to Bolter and Grusin, the claim that a device provides a superior route to the real or authentic also involves "a redefinition of the real or authentic that favors the new device" (65). Such a redefinition has in fact been one of the central goals of theoretical literature in humanities computing, especially literature that deals with scholarly editions. The argument is that computers make possible a different kind of study of literature than has been traditionally available, and that this new form of scholarship allows scholars to test their assumptions or to gain access to information and insights that were previously out of reach. Susan Hockey gives an example of this kind of argument in her book *Electronic Texts in the Humanities*, in which she argues that "simple statistical tools can help to reinforce the interpretation of the material. These studies are particularly suitable for testing hypotheses or for verifying intuition. They can provide concrete evidence to support or refute hypotheses or interpretations which have in the past been based on human reading and the somewhat serendipitous noting of interesting features" (Hockey 66).

If the real or authentic is to be redefined by digital scholarly editions, then a question that must be asked is how this is to be accomplished. Which of the logics of remediation is best suited to the task? Transparent



immediacy allows the user to clearly and accurately view objects under consideration without distraction, whereas hypermediacy allows comparisons between versions of texts to be made, tools for textual analysis to be offered, means of navigation to be provided, and other benefits. In the case of textual materials, the maximum amount of transparency could be achieved simply by providing a PDF of an original document. However, such an edition would not offer the tools, transcriptions, and editorial content that users of scholarly editions want and need. Therefore, all scholarly editions offer an interface that Bolter and Grusin would call “hypermediated.” This is unsurprising given Bolter and Grusin’s contention that “the strategy that dominates on the Web is hypermediacy, attaining the real by filling each window with widgets and filling the screen with windows” (210).

However, Bolter and Grusin also note that “CD-ROM or DVD encyclopedias... promise a new transparency through the animation, video, and audio that cannot appear in a printed version” (203). Since Bolter and Grusin wrote this, multimedia artefacts have gained a solid foothold on the Web, including in Web-based scholarly editions. The answer to the question of hypermedia versus transparent immediacy for scholarly editions, then, would seem to be that both are valuable. And in fact a look at digital scholarly editions themselves would seem to confirm this. Decameron Web and the Online Chopin Variorum Edition allow labels containing metadata or controls to be hidden, William Godwin’s Diary, Perseus Digital Library, and Vincent van Gogh: The Letters allow unneeded toolbars and other interface

elements to be collapsed, and many editions allow facsimile images to be zoomed in on and viewed in isolation. The key seems to be customizability: give users maximal control through the use of hypermediated elements, but give them the means to hide these elements when necessary to allow for undistracted reading.

## Conclusion

By analyzing digital scholarly editions in terms of sophisticated theories of new media, a more nuanced understanding has been reached than is typically the case in theory-free discussions of scholarly editions. The consensus of writers such as McGann and Shillingsburg that the electronic environment represents a superior platform for scholarly editions may have merit; however, one's understanding of digital scholarly editions cannot be said to be complete simply by virtue of having reached this conclusion. A more detailed comprehension involves an examination of digital scholarly editions as a particular instance within the broader context of current media theory. This kind of application of theory to concrete examples can serve to test and to deepen the theories being employed, and may also help in the design and implementation of future digital scholarly editions.

## Chapter 2: Print vs. Web

In the previous chapter, we explored some of the tensions between theoretical writing on scholarly editions and new media theory more broadly considered. In this chapter, another tension involving theoretical writing on scholarly editions will be investigated. This time, however, the tension is not between theory and theory, but rather between theory and practice. The fact is that although there exists a general consensus that the screen is a superior medium for scholarly editions than print, a number of editors have published printed editions alongside or after digital ones, including even Jerome McGann, who has argued for the superiority of digital editions.

To address this apparent contradiction between theoretical discourse and actual practice, this chapter will analyze a selection of scholarly editions that have been implemented in both digital and printed environments by the same editor(s). By comparing editorial decisions, an identification of the structures and mechanisms that are either shared or unique in each will be made, and an evaluation of the affordances available in each case will be provided. Finally, I will apply some of the theories of new media from chapter 1 in an attempt to explain the continued survival of printed scholarly editions. Specific scholarly editions that I will focus on in this chapter are the British Library, National Library of Russia, St. Catherine's Monastery, and Leipzig University Library's edition of the *Codex Sinaiticus*, and Daniel Paul O'Donnell's edition of *Cædmon's Hymn*.

Results of this chapter are likely to be useful both for developing new digital interfaces and for understanding the print and digital dynamics within scholarly edition publishing.

## Research Questions

Robinson's rhetorical question "Who would publish a scholarly edition in print, now that the digital medium exists?" constitutes a good starting point for the current chapter. However, in order to understand the continued existence of printed scholarly editions, in addition to asking *who* would produce a printed scholarly, we must also ask the more important questions of *why* they would produce it, and *how* they would implement it differently than they would a digital edition. In answering these questions, I hope to achieve a better understanding of the reasons for the continued survival of printed editions, as well as the ways in which they differ from their digital counterparts.

## Sample

Since we are investigating reasons for the existence of printed editions, our sample must obviously include them. Furthermore, given that our research question involves the survival of printed editions in the digital environment, such editions should have been produced since the advent of the digital era. Finally, we include only scholarly editions that have been published in *both* print and digital format, by the same people. This constraint has been introduced because it ensures that decisions regarding

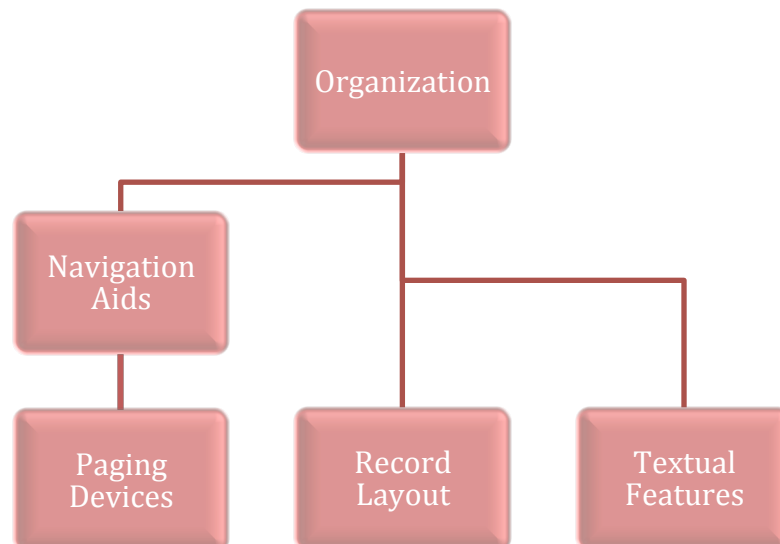
the production and implementation of both printed and digital editions are a result of the medium involved rather than to idiosyncratic preferences of different editors.

### **Analytical Apparatus**

In order to fruitfully compare printed editions with digital ones, three modes of comparison will be employed. Firstly, statements regarding the purposes of both printed and digital editions from the editors of the editions themselves will be compared. Such statements can often be found in the introductions to the editions, and also within papers written about them. This mode of comparison will provide direct evidence regarding the reasons that each edition was produced, and will help to answer our second research question.

Secondly, in order to compare *how* the printed and digital editions have been implemented, and to identify advantages and disadvantages in each, a framework for comparison must be employed. We propose to use one developed by Geoffrey Rockwell and the INKE Interface Design team, described in a paper entitled “The Face of Interface: Studying Interface to the Scholarly Corpus and Edition.” In that paper, a number of interface features were identified that could be used to compare corpus and scholarly edition interfaces. The framework described was developed as a means of developing insights rather than as a conclusion in its own right, and other frameworks are certainly possible (Rockwell et al., 6). All of the features serve to aid users to “consult” a work, which typically involves searching,

skimming, and close reading, in that order (Rockwell et al., 6). The features are as follows: (1) organization, (2) navigation aids, (3) record layout, (4) paging devices, and (5) textual features. Organization refers to the structure of an edition as a whole. Record layout refers to the design of a particular unit of information, and how it is displayed. Textual features include modifications to the text itself, such as colour, underlining, and size. Navigation aids include elements like tables of contents and indices, and serve to help users search or browse the work. Paging devices function to orientate users within a work, and to help make navigation aids function. The features seem to bear certain relationships to each other, and a hierarchical diagram can be produced to show these (see fig. 1). Specifically, paging devices seem to be a subcategory of navigation aids, and all features can be seen as subordinate to organization.



**Figure 1: Framework of interface design features**

The particular interface features that have been implemented in a given edition affect the content that can be delivered. Conversely, the kind of content that must be displayed will guide decisions as to appropriate interface features to implement. Therefore, content will serve as a final point of comparison between printed and digital editions.

## **Method**

The method used in this study is called “document analysis.” In “Document Analysis as a Qualitative Research Method,” Glenn A. Bowen explains document analysis as “a systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge” (Bowen 27). The analytical apparatus described above and illustrated in Figure 1 has been applied to each of the editions under consideration.

## **Results**

### **Codex Sinaiticus**

#### ***Introduction***

The *Codex Sinaiticus* is the oldest complete manuscript of the Christian Bible that is presently available, dating from the fourth century. The Codex Sinaiticus Project was undertaken in 2002 by the four institutions that currently hold the constituent parts of the manuscript: the British Library, the Library of the University of Leipzig, the National Library of Russia in Saint Petersburg, and the Holy Monastery of the God-Trodden Mount Sinai (Saint Catherine's). One outcome of the project is a freely accessible website that includes high resolution facsimile images in two different kinds of light, transcription, translations, notes regarding physical characteristics of the manuscript, and historical introductions to the manuscript and to the project. Another outcome is a £495 printed facsimile edition of the complete Codex, which comes with a small reference guide containing a concordance and historical introductions to the manuscript and to the project. A further outcome is a printed book by David Parker called *Codex Sinaiticus: The Story of the World's Oldest Bible*, which contains a more detailed history of the Codex and of the Project.

The *Codex Sinaiticus* is an especially interesting example of a book being adapted to the electronic environment, in that the book being adapted may be regarded in some ways as prototypical; as Christian Vandendorpe writes in his book *From Papyrus to Hypertext*, "the book is the quintessential mythical object of Christianity" (119). It might therefore be conjectured that for certain people, some of the appeal of the printed version of this particular text derives from the important status of the codex in Christian iconography.



### *Purpose*

Despite the fact that a project report on the Codex Sinaiticus Project states that “there will be a range of electronic and printed outcomes created from the digital images and associated scholarly work” (Henschke 49), it is written on the website of the *Codex Sinaiticus* that the principal goal of the Project is “to reunite the entire manuscript in digital form and make it accessible to a global audience for the first time” (Milne et al.). It should be noted that the “digital form” mentioned here refers to the digital images of the manuscript, and so includes both the printed manuscript and the website. Subsidiary aims of the project include historical research, conservation, digitization, transcription, and dissemination (Milne et al.).

With regard to the website in particular, the creators state that the “creation of a scholarly, machine-readable transcription, linked by word to the manuscript images, is providing textual scholars with possibilities for research and analysis never before available” (Milne et al.).

In the small reference guide that accompanies the printed facsimile, there is a statement to the effect that despite the fact that they had to be reduced in size by 5% from the originals, the images that compose the facsimile are meant to “represent faithfully the actual appearance of the pages” of the manuscript (p. 5). A conference paper describing the project adds that the printed facsimile is meant to “enable full access to a life-like copy of the original manuscript” (McKendrick and Garcés).

Comparing these statements of purpose, it seems clear that although increased accessibility is a goal in the production of both the website and the facsimile, the website also emphasizes added functionality, whereas the facsimile highlights similarity to the original. With regard to accessibility, it might be pointed out that a freely available website is much more accessible to a majority of people in a majority of situations than an expensive printed facsimile edition.

### *Interface Features*

#### Organization

In terms of physical organization, the printed version is composed of a number of related documents; the facsimile edition proper (see fig. 2), the reference guide (see fig. 3), and a book by David Parker. The website, on the other hand, is a single entity, composed of interlinked documents.



**Figure 2: The *Codex Sinaiticus* facsimile edition (British Library)**



Figure 3: The reference guide for the *Codex Sinaiticus* facsimile edition (British Library)

This difference means that accessibility is decreased for most people (i.e., those who have access to the Internet) using the printed version, as multiple documents must be located and acquired. It also means that while the website offers convenience and easy reference, the printed version allows the user to focus on the Codex itself, without the presence of extraneous material.

As to functionality, the ability to spread multiple printed documents out on a table and to compare them could be seen as an advantage, as might the ability to read documents in isolation, without having them distract from each other; however, the Web version does allow some content to be

compared side-by-side as well, in separate panes, and it is also possible to hide panes.

### Navigation Aids

The printed facsimile edition of the *Codex Sinaiticus* contains no navigation aids itself. The reference guide that accompanies it includes a concordance that correlates passages with pages (see fig. 4).

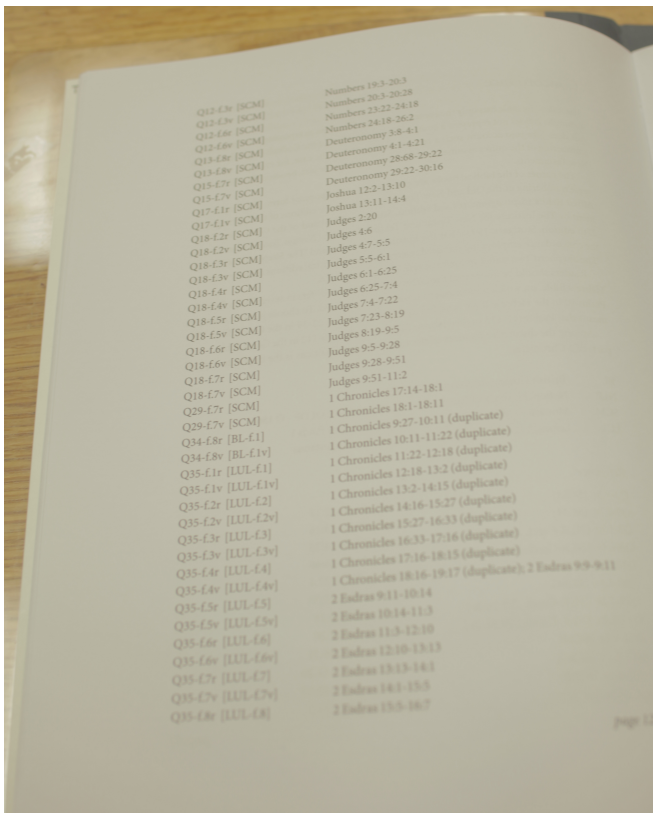


Figure 4: Concordance in reference guide to *Codex Sinaiticus* (British Library)

The digital edition performs the same function by means of a navigation bar and dropdown menus (see fig. 5).

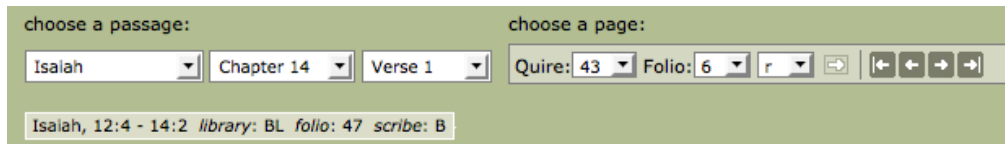


Figure 5: Navigation bar in *Codex Sinaiticus* website (Milne et al.)

Basic and advanced search functionality is also provided in the digital version; the advanced version allows searching within specific textual sections of the site.

Comparing the navigation aids in the printed and digital editions, it seems apparent that locating material is faster and easier in the digital version, particularly if searching for specific words is taken into account (something that is not possible in the printed edition). However, the navigation aids in the digital edition are always present and accessible on the same page as the rest of the content; in the facsimile version, it is possible either to keep the reference guide open beside the facsimile, or to close it and avoid distraction. Therefore, in this case the user sacrifices a degree of personal choice for the increased functionality of the digital edition.

The inability to remove navigation aids from one's field of view is a common feature of digital editions; this fact points to a fundamental difference in the way that printed editions and digital ones are used. As Christian Vandendorpe writes, "everyone today knows that you don't read hypermedia – you navigate or surf" (116). The omnipresence of navigation aids in digital editions may be due to a difference in their intended use, namely the fact that they are meant to be navigated rather than read.

## Paging Devices

The facsimile version gives the page, a code for the name of the institution that houses it, and the page as it is numbered by that institution (see fig. 6).



**Figure 6: Paging device in *Codex Sinaiticus* facsimile edition (British Library)**

In the digital edition, the navigation bar doubles as a paging device, showing not only the page, but the verse, as well as the scribe who penned it (see fig. 5). In effect, the concordance provided in the reference guide to the printed edition has been implemented as a paging device and as a navigation aid, in one.

Other paging devices contained in the Web version include arrows that allow the user to move backwards or forwards through the codex, as well as to jump directly to the first or last page; tabs indicating the language of the interface; boxes indicating the kind of light being shown in the image, the unit of text being shown in the transcription, and the language of the

translation; and a box in the corner of the image of the manuscript showing one's current position in relation to the page as a whole.

In the printed facsimile edition, the only information included on the pages in addition to the photograph of the manuscript page is the paging device; this represents a minimal intrusion into the experience of examining the original document. With regard to the Web version, the sophisticated paging devices greatly enhance functionality, but constantly invite the attention of the user, and might be considered distracting.

### Record Layout

The layout of the facsimile is almost as simple as possible, showing on each page a photograph of a corresponding original manuscript page (about 5% smaller than its original size) (see fig. 7).

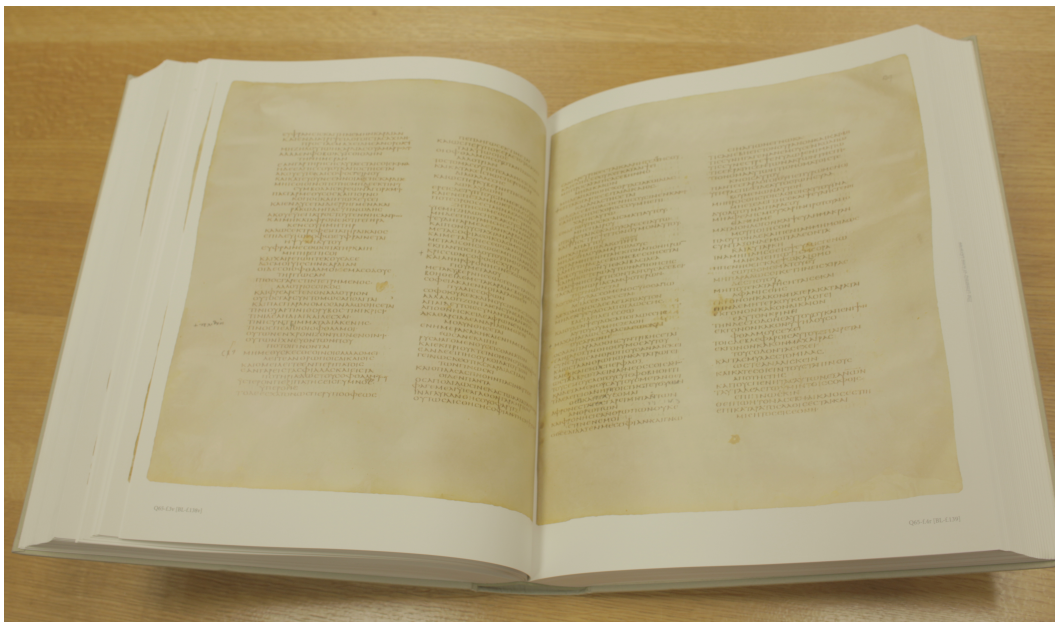


Figure 7: Layout of *Codex Sinaiticus* facsimile version (British Library)

A benefit of such simplicity is that the physical manifestation of the book provides an approximation of the look and dimensions of the original codex. A review of the facsimile offers some insight into the value of the printed version as compared to the digital one:

Firstly, the online images do not allow for a display of a full manuscript page at anything like its full size.... Notwithstanding [the] slight reduction in size, the print version gives a real sense of the size of the parchment pages. The second advantage also relates to size. The reproduction of the entire surviving leaves of the Codex in a physical form also provides an unrivalled sense of the overall dimensions of the original, and the reason why so few complete bibles were prepared as single books prior to the advent of printing. (Foster 543–544)

The digital version is far removed from the original, with many boxes and controls with which to perform various operations (see fig. 8).



The screenshot displays the Codex Sinaiticus website interface. At the top, the logo "Codex Sinaiticus" is visible alongside navigation links for "Contact", "Copyright", and "Sitemap". A search bar with "Advanced search" is also present. Below the header, a navigation menu includes "HOME", "ABOUT CODEx SINAITICUS", "ABOUT THE PROJECT", and "SEE THE MANUSCRIPT". A "GO TO:" dropdown menu is set to "(BOOK)".

The main content area is divided into several sections:

- Navigation:** "choose a passage:" with dropdowns for "Revelation", "Chapter 1", and "Verse 1". "choose a page:" includes "Quire: 90" and "Folio: 1" with navigation arrows.
- display options:** Checkboxes for "Image", "Transcription", "Translation", and "Physical Description".
- Image View:** Shows a high-resolution scan of the manuscript page in "Standard Light" and "Raking Light" modes. A red box highlights a specific section of the text.
- Transcription View:** Displays the text in a structured format, showing verses (1:1, 2, 3) and columns of text. A red box highlights a specific section of the text.
- Translation View:** Offers translations in "Русский", "Ελληνικά", "Deutsch", and "English". The English translation is visible, starting with "1:1 The revelation of Jesus Christ, which God gave to him, to show to his servants things that must shortly take place, and having sent by his angel he made it known to his servant John, 2 who became a witness to the word of God and the testimony of Jesus Christ, whatever things he saw. 3 Blessed is he that reads and they that hear the words of the prophecy, and that keep the things that are written in it; for the time is at hand. 4 John to the seven churches that are in Asia: grace to you and peace from him who is, and who was, and who comes."

At the bottom, the website is supported by logos for "DFG", "Arts & Humanities Research Council", "ANU", and "RSS".

Figure 8: Layout of Codex Sinaiticus website (Milne et al.)

Various panes make it possible to zoom in on and pan across the original manuscript, to view it in two kinds of light, to see a transcription by verse or by page, to see a translation in one of four languages, and to see a physical description of the manuscript page. These different types of content can be hidden or revealed by the user, but the end result is that the interface ends up looking more like a complicated machine than an ancient manuscript.

An additional factor with regard to record layout pertains to the transcription. Whereas the printed version is restricted to the continuous columns of unbroken prose of the original, the Web version gives users the opportunity to use the modern conventions of verses and chapters to

structure the layout of transcriptions, or to view them as they are laid out on the pages of the manuscript. This undoubtedly constitutes a great advantage for scholars who are used to such conventions, although it might also be argued that it imposes a modern point of view on the original document.

### Textual Features

The printed facsimile edition is devoid of notes and annotations, other than the ones that appear in the manuscript itself. The Web edition has transcriptions that are mapped to the manuscript, so that clicking on a word in the transcription highlights the word in the manuscript. It also implements some of the words in the transcription as links that produce hover text with information about changes made to the original text and the scribes who made them.

Again, the advantage of the printed version's approach is to let the user concentrate on the original document without distraction. The textual features of the Web version provide additional information, and give the reader the opportunity to easily compare a transcription of the text with the original manuscript.

### *Content*

The printed facsimile contains only the photographs of the pages of the manuscript, along with the paging devices previously mentioned. The reference guide contains some history of the manuscript and the project, and the volume by David Parker contains a more detailed history.

In addition to the historical material in the reference guide, the Web version contains a transcription of the entire manuscript, translations in four languages of portions of it, much higher resolution images than could be produced in the printed version, images of every page in two different kinds of light, and detailed physical descriptions of the pages.

With the exception of the material in David Parker's book, the digital edition obviously contains much more content than the printed one. A sizeable amount of this content might be considered unnecessary by some users; indeed, Peter Shillingsburg writes that a fundamental danger of digital scholarly editions is information overload: "The comprehensiveness of the electronic archive threatens to create a salt, estranging sea of information" (Shillingsburg, *From Gutenberg to Google* 165). In a nod to this sort of concern, the digital edition allows panes of content to be hidden.

### **Conclusion**

The difference between the printed and digital versions of the *Codex Sinaiticus* might best be understood in terms of Jay David Bolter and Richard Grusin's theory of remediation. As we saw in the preceding chapter, remediation is "the formal logic by which new media refashion prior media forms," and its two "logics" are transparent immediacy and hypermediacy (273). Transparent immediacy attempts to "make the viewer forget the presence of the medium," whereas hypermediacy "works to remind the viewer of the medium" (Bolter and Grusin 272). It seems clear that the

printed facsimile edition attempts to achieve transparent immediacy, allowing the user to ignore the distraction of the medium itself and to slip into the illusion that they are touching and reading the original manuscript. The digital version is a classic example of hypermedia, calling attention to itself by providing an array of tools and panes with which to dissect and study the text. These tools are useful for conducting new kinds of research, but are distracting for those who desire a representative experience of the original text. It seems to be this authenticity and transparency that are the most valuable aspects of this particular printed edition, and the principal reason that it was produced.

## *Cædmon's Hymn*

### *Introduction*

*Cædmon's Hymn* is the oldest surviving Old English poem, composed in the 7<sup>th</sup> century AD. Daniel Paul O'Donnell's edition of the poem was published in 2005, and was released both as a book and as a CD-ROM, sold together as a "multimedia study, edition, and archive" (O'Donnell). As a deliberate exercise in the creation of a multimedia edition, it provides an enlightening example as to reasons for the survival of printed scholarly editions.

### *Purpose*

Originally conceived as a CD-ROM only, O'Donnell decided to publish *Cædmon's Hymn* as a paper book as well, based on the results of an

experiment he conducted. In this experiment, readers retained more information from the lengthy introduction when reading a printed version of the material than a digital one (O'Donnell 17).

*Cædmon's Hymn* was thus designed deliberately to take advantage of the strengths inherent in each medium. O'Donnell argues that print is better than the screen at presenting "long and complex narratives and arguments... or material intended for ready reference" (O'Donnell). Additionally, he states that the printed edition is a more appropriate medium for scholars who are interested in the hymn but do not need all the variants of a given manuscript, or paleographic details associated with them (O'Donnell). The screen-based version, on the other hand, is more useful "for those who do need to know more about the manuscripts or textual variants, or who need to be able to find specific wordings in order to disagree" (O'Donnell).

### *Interface Features*

#### Organization

With regard to physical organization, O'Donnell himself argues that the print edition is "easy to boot, portable, has no problems with batteries, and can be read even in strong sunlight" (O'Donnell) (see fig. 9).

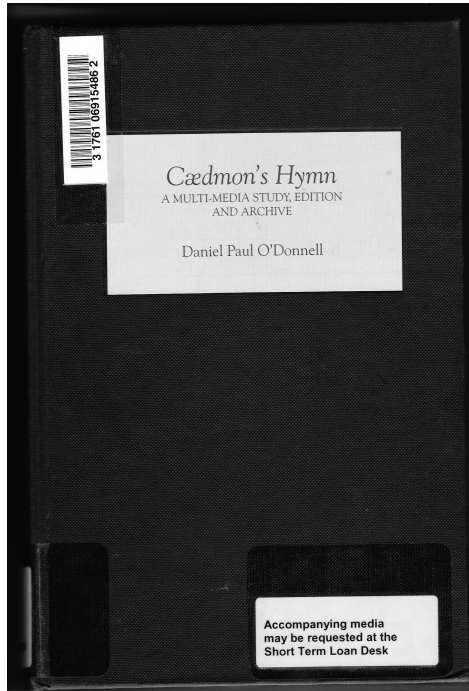


Figure 9: Printed edition of *Cædmon's Hymn* (O'Donnell, *Cædmon's: Hymn: A Multimedia Study, Edition and Archive*)

The CD-ROM, on the other hand, requires a machine on which to run, takes longer to load, and is not as convenient for those wishing to read in adverse conditions (see fig. 10).



**Figure 10: Digital edition of *Cædmon's Hymn* (O'Donnell, *Cædmon's Hymn: A Multimedia Study, Edition and Archive*)**

As to internal organization of materials, the situation is much the same in the electronic version as it is in the printed one. In this way, the electronic version of *Cædmon's Hymn* is very much like a value-added book. For example, in both versions there is a table of contents, followed by a preface, followed by a series of chapters, and a glossary followed by a works cited list and an index at the end. There is however one noticeable with regard to organization in the digital edition. Whereas items in the printed edition are laid out sequentially, the digital edition is able to implement a hierarchical form of organization: different items within a single category are navigable using “previous” and “next” links, whereas items in different categories can be accessed more quickly by means of “up” and “down” links (see fig. 11).

- Up (Table of Contents)
- Previous (*ylða*)
- Next (Bd)
- Down (Index)

Figure 11: Hierarchical organization in screen-based version of *Cædmon's Hymn* (O'Donnell, *Cædmon's Hymn: A Multimedia Study, Edition and Archive*)

The digital version is thus able to provide an extra “dimension” to the organization that the printed version cannot offer.

This difference notwithstanding, it might be argued that the implementation of O'Donnell's digital edition is quite similar to that of his printed edition. Peter Robinson denounces this kind of digital execution in his article “Where We Are with Electronic Scholarly Editions, and Where We Want to Be,” arguing that up until now digital scholarly editions have simply replicated the contents and forms of printed scholarly editions, even though they have the potential to be much more innovative.

### Navigation Aids

Navigation aids in the printed version include a table of contents, a general index, and a manuscript index. There is also a list of illustrations. Within the text there are frequent cross-references to passages in the various versions of the hymn throughout the text and the glossary.

The digital version of *Cædmon's Hymn* contains the same table of contents as the printed version, although it also has an expanded version that provides a more detailed view. The digital version also contains the same



general and manuscript indices that appear in the printed version, although it lacks the list of illustrations.

A navigation menu appears on every page of the digital version, containing links to alternative views of the text in question, as well as related information. Additionally, in the Windows version, the full text has been indexed to allow full text searching of the entire document.

With regard to the cross-references, the electronic version makes heavy use of hyperlinks (see fig. 12).

Nu [p]ue sc[iu]lun<sup>2</sup> herga hefunricaes [p]ueard,  
 metudaes mehti, and his modgedanc<sup>3</sup>,  
 [p]uerc [p]uldurfadur— sua<sup>4</sup> he [p]undra gihuaes,  
 eci drichtin, or astalde!  
 5 He aerist scoop eordu<sup>5</sup> bearnum  
 hefen<sup>6</sup> to hrofe, halig sceppend;  
 [ð]a<sup>7</sup> middu[n]geard<sup>8</sup>, moncinnes [p]eard,  
 eci drichtin, aefter tiade  
 firum on foldu, frea allmechtig.

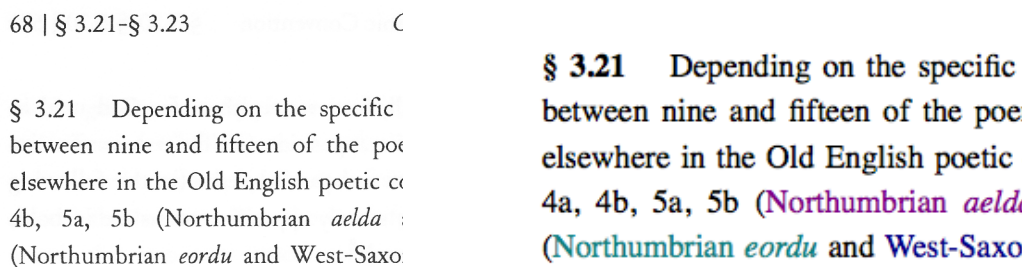
Figure 12: Every word and footnote is a hyperlink in this passage from the screen-based version of *Cædmon's Hymn* (O'Donnell, *Cædmon's Hymn: A Multimedia Study, Edition and Archive*)

The continuous presence of navigation aids in the digital version in the form of menus, search, and hyperlinks, works to provide a significant advantage in terms of navigational speed and precision over the printed version, although it also provides a constant enticement to click. Anne Mangen argues in regard to hyperlinks that “when we do have options to rekindle our attention easily by outside stimuli, we are... inclined to resort to them, rather than to consciously trying to resist such distractions by attempting to structure consciousness from within (which is more effortful)” (Mangen 410). In

effect, by making navigation easier, the navigation aids in the digital version also make navigation more likely, and serve as distractions from the core of the edition, which is the text.

### Paging Devices

In terms of paging devices, the section sign is used in both versions to indicate paragraphs (see fig. 13).



**Figure 13: Section sign used in printed and screen-based versions of *Cædmon's Hymn***

(O'Donnell, *Cædmon's Hymn: A Multimedia Study, Edition and Archive*)

This was done in order “to facilitate comparison of the print and screen versions” (O'Donnell, “Different Strokes, Same Folk” 113). Due to the fact that paragraph numbers have been implemented, page numbers from the printed edition are not given in the electronic one.

In terms of headers, slightly different information is given in each case, with the print edition showing the sections appearing on the current page and the page number, and the electronic edition showing the title of the chapter at the top of the window. At the top of the page in the electronic edition there is more detailed paging information in the navigation menu, although this is not visible without scrolling when reading most of the text. The information given at the top of the print page is more limited, but always

visible. The permanent presence of paging devices in the printed edition might be seen as providing a certain foundation to the text on the printed page; an indication of the relationship of the text being read to the rest of the text is always present, whereas in the digital version it becomes easy to forget one's current location with respect to the work as a whole.

### Record Layout

Regarding record layout, the printed page requires that longer sections be broken into separate pages. The digital version, on the other hand, implements each conceptual section as a single page, which must be scrolled in order to read.

Despite the fact that conceptually related text must be broken up into arbitrarily defined pieces in the printed version, the greater resolution of the printed page means that it is often possible to view an entire record at once (see fig. 14).

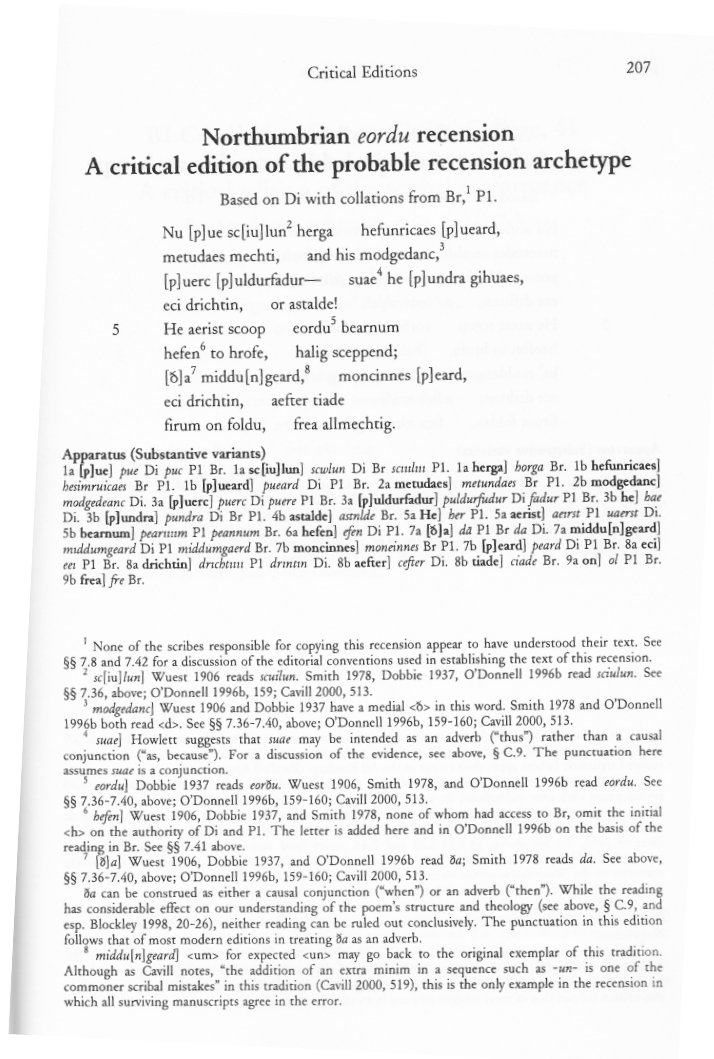


Figure 14: An entire record on one page in the printed version of *Cædmon's Hymn* (O'Donnell, *Cædmon's Hymn: A Multimedia Study, Edition and Archive*)

The digital version, on the other hand, implements each conceptual section as a web page, which must be scrolled through in order to be read when using a legible font size. Various writers have commented that scrolling on the screen represents a step backward in terms of functionality from the printed page, and in fact an experiment by Erik Wästlund and others has shown that

scrolling reduces reaction time and increases mental workload (Wästlund, Norlander, and Archer).

Another advantage of the printed version includes the fact that notes are shown at the same time as the referring text. The web version implements footnotes as hyperlinks, taking the reader to the bottom of the page and away from the referring text, essentially turning footnotes into endnotes. Robert Hauptman argues that placing notes alongside text makes them easier to read, contending that “scholars who interest themselves in documentation invariably prefer the substantive footnote over all other possibilities” (35).

#### Textual Features

As to textual features, one of the most noticeable differences between the electronic and printed editions concerns the use of colour; whereas the printed edition is black and white, the digital edition uses seven different colours to indicate additional information in the text, including for hyperlinks, associations with various versions of the poem, and the presence of corrections. This use of colour is very informative, although a drawback is that it makes the text somewhat difficult to read (see fig. 15).

- Di Dijon, Bibliothèque Municipale, 574
- H Oxford, Bodleian Library, Hatton 43
- Hr Hereford, Cathedral Library, P. 5. i
- Ld Oxford, Bodleian Library, Laud Misc. 243
- Ln Oxford, Lincoln College, lat. 31
- M Cambridge, University Library, Kk. 5. 16 (“The Moore Bede”)
- Mg Oxford, Magdalen College, lat. 105
- N London, British Library, Additional 43703

Figure 15: Text of different colours in the screen-based version of *Cædmon's Hymn* (O'Donnell, *Cædmon's Hymn: A Multimedia Study, Edition and Archive*)

Another difference concerns the use of symbols. Both the printed and digital editions use them, but the digital edition also uses hover text to remind the reader of their meaning. This means that there is less of a learning curve to be able to use the digital edition as compared to the printed one. This ease of use makes the digital edition considerably more accessible, but also means that users do not require as significant an intellectual effort to use it. This lack of effort may be seen as translating to a lack of intellectual investment in the work and to shallower engagement with it, a phenomenon bemoaned by Nicholas Carr, among others (N. Carr).

### *Content*

As to content, the printed version contains lengthy literary, historical, textual, and linguistic introductions and notes. It also contains critical editions of various versions of the poem, and an archive containing transcriptions of all known witnesses of the poem.

All content in the printed edition of *Cædmon's Hymn* is replicated in the digital version. In addition, the digital version contains full-colour facsimile images, a selection of different kinds of transcriptions (such as diplomatic and semi-diplomatic), options for changing the apparatus to show different sorts of variation (including “significant,” “substantive” and “orthographic”), and options to combine the content that exists in the edition in different ways, such as to produce parallel text editions. With regard to content, then, the digital version is clearly more comprehensive than the printed one, which is one of the commonly cited advantages of digital editions as compared to printed ones.

### *Conclusion*

O'Donnell's multimedia edition of *Cædmon's Hymn* provides an excellent example of a text that has been purposely implemented in both printed and digital versions in order to take advantage of the relative strengths of each. In terms of our research questions, the answer as to why printed editions are still produced seems in this case to be that the editor believed that print offers a number of advantages over the screen as a medium of display, and he wanted to take advantage of those. Specific advantages of the printed version include that it can be read in a wider variety of situations and environments than the digital edition; there are page numbers, which provide an added mode of reference; entire records can be viewed at once on a single page; pages can be turned, rather than scrolled through; notes can be viewed alongside the text; text is all one colour,

allowing easier reading; and a lack of clickability provides less enticement to leave the current page.

Whereas the reason for the continued existence of a printed edition of the *Codex Sinaiticus* might best be understood in terms of Bolter and Grusin's theory of remediation, the difference between the printed and digital versions of *Cædmon's Hymn* might best be understood in terms of Lev Manovich's distinction between narratives and databases.

In his book *The Language of New Media*, Manovich argues that databases are replacing narratives as the "key form of cultural expression" of the modern age (194c). As we saw in Chapter 1, Manovich points out that "multimedia works that have 'cultural content' appear to particularly favor the database form" (195c). As opposed to narratives, which are typically read from beginning to end, databases are characterized by a non-linear presentation that allows all material to be accessed quickly from any point. In the case of text, the result is that rather than engaging in traditional reading, users "view, navigate, and search" (219). The tradeoff represented by this arrangement is that new media objects lend themselves more to non-sequential browsing than to extended reading. O'Donnell's edition of *Cædmon's Hymn* seems to recognize this idea, using the benefits of both print and screen to take advantage of both kinds of consultation.

## Conclusion

The printed editions of the *Codex Sinaiticus* and *Cædmon's Hymn* that we have looked at have been produced for different reasons; in the first case,



an attempt at an authentic representation of an original manuscript is made, whereas in the second, the aim is to facilitate extended reading. However, it seems clear that in both cases, the editors have chosen to publish in both printed and digital formats in order to take advantage of the strengths inherent in each medium. If the existence of these strengths is acknowledged, then claims to the effect that printed scholarly editions are already obsolete seem somewhat premature.

## Chapter 3: Digital Scholarly Editions

### Introduction

As discussed in the general introduction, scholarly editions lack a unified definition. This lack is reflected in the wide variety of forms the scholarly edition has taken, and of the functions that it performs. In print, there have been critical editions, type facsimile editions, variorum editions, genetic editions, parallel text editions, and synoptic editions (Greetham); editions that privilege bibliographical, authorial, historical, sociological, or aesthetic approaches to text (Shillingsburg, *Scholarly Editing in the Computer Age*); and editions that may focus on copy-text, best-text, diplomatic, scribal, documentary, or social-text editing (Modern Language Association).

In a sense, the move to the screen has erased this plurality; as Edward Vanhoutte proclaims in “Electronic Textual Editing: Prose Fiction and Modern Manuscripts: Limitations and Possibilities of Text-Encoding for Electronic Editions,” “The hypertext edition, the hypermedia edition, the multimedia edition, the computer edition, the digital edition, the electronic edition are all synonymous labels for a concept without a definition” (Vanhoutte). As we shall see in this chapter, however, despite the increasing difficulty in categorizing them, the diversity of functionalities of scholarly editions has remained, if not increased.

## Research Justification

Despite Jerome McGann's statement in "The Rationale of Hypertext" that the shift from print to the screen would be "revolutionary," some writers have questioned this characterization. Lina Karlsson and Linda Malm's study of online scholarly editions, published in 2004, concludes that although electronic editions are "viewed as being better than the printed... in practice they were not so revolutionary. Instead they incorporated the features of the printed medium to a large extent" (Karlsson and Malm 28). They argue that "*remediation* is a more accurate term to use" (Karlsson and Malm 2).

As Karlsson and Malm's study has been the only rigorous study of digital scholarly editions, and since it is already nearly half the age of digital scholarly editions themselves, it seems sensible to conduct a new one. Therefore, part of the purpose of the present chapter will be to determine whether in the seven years since the publication of Karlsson and Malm's article the term "revolutionary" has become more appropriate as an adjective to describe electronic scholarly editions. Additionally, unlike Karlsson and Malm's study, this one will explore the particular ways in which specific functionalities are implemented in digital scholarly editions, giving a more qualitative perspective than they chose to provide.

## Research Problem

In order to investigate the implementation of scholarly editions on the web, we must begin by defining our research question. The following will be useful: “How have the functionalities afforded by the digital environment been implemented in online scholarly editions?”

## Identification of Functionalities

In order to begin, we must first choose and define the functionalities that will serve as our analytical apparatus. In order to limit the scope, functionalities to be considered have been limited to what might best be described as “internal” rather than “external” ones, in that they are features of the work itself rather than ways in which the work may be used. This has been done because external features may be numerous and somewhat idiosyncratic. Based on our own investigation of various websites, as well as a review of relevant literature, the following categories of functionalities seem to stand out as being fundamentally altered by their implementation on the web.

(1) **Navigation.** On paper, searching can be done by means of the table of contents or the index, and browsing can be accomplished simply by flipping pages. Online navigation has been one of the most fundamental areas of development since the advent of the Web. Two approaches stand out: “Browsing, enabled by hypermedia links, was the first technology for accessing information... However.... Searching has now become a major, perhaps the major, means of locating information on the web” (Sears and

Jacko 565). As in the Web as a whole, browsing and searching are both extremely important in scholarly editions. Browsing is accomplished primarily by means of hypertext, which has been described by George P. Landow as having “the power to change both our experience and our understanding of text and author. It therefore has the potential to reconfigure the nature of the scholarly edition in ways that might appear radical” (Landow). Lyman argues that searching can go beyond browsing in allowing users to pose questions that have never been thought of by the editors of the edition: “Querying the text and apparatus of the editions that it displays in ways that will go beyond the sets of preconceived questions that they have been ‘programmed’ to handle calls for a thoroughgoing search capacity, one powerful enough to elicit surprises from the edition's text” (Lyman, “Assistive Potencies: Reconfiguring the Scholarly Edition in an Electronic Setting” 156). Searching is implemented by means of search boxes. However, innovative means of navigation have also been implemented in scholarly editions alongside more standard ones.

(2) **Annotation.** Private annotation is largely limited on paper to writing in the margins, and public annotation is impossible outside of publishing papers (or scholarly editions of one's own) on the material. The historical importance of note taking both to memory and to writing has been remarked on by Ann Blair (Blair 63). On the Web, both public and private annotation is possible, and each has been employed in various ways in scholarly editions. Peter Shillingsburg believes that public annotation is key

to the future of the scholarly edition, which will be “constructed modularly and contributed to by ‘a village’ of scholars” (Shillingsburg, *From Gutenberg to Google* 97).

(3) **Analytical tools.** Tito Orlandi has written that the computer cannot radically transform the humanities simply by means of word processing or “computer alphabetization;” rather, it is only “when the computer is applied in its full capacity of running algorithms, [that] humanities are confronted with a radically new situation” (Orlandi). By performing operations on the text, the computer can be used to do fundamentally new and different research than is feasible with paper editions. Such research includes visualization and textual analytics.

(4) **Customizability.** It has been argued that among the most distinctive features of the Web is its fluidity; as Jay David Bolter notes in *Writing Space: Computers, Hypertext, and the Remediation of Print*, “electronic writing is fluid and dynamic to a greater degree than previous technologies” (Bolter 8). The fluidity of the digital medium allows users the possibility of customizing both the interface and the content; possibilities include the ability to view multiple versions of texts in multiple languages, the ability to alter or reposition elements of the interface, the ability to compare different documents side-by-side, the ability to zoom in and pan across high-resolution images, and the ability to experience multimedia artefacts.

## Code Book

For easy reference, a bullet list of functionalities and their categories follows:

- Navigation
  - Browsing
  - Searching
- Annotation
  - Public annotation
  - Private annotation
- Analytical tools
  - Visualization
  - Textual analysis
- Customizability
  - ... of the interface
    - Side-by-side comparison
    - Zoomable images
    - Other
  - ... of the content
    - Multiple versions
    - Multiple languages
    - Multimedia

Each of these functionalities has been marked as either present or absent with regard to each of the digital scholarly editions under consideration.

Additional information about how the functionalities are implemented is recorded as well.

## Sample

Karlsson and Malm's 2004 study consisted of 31 digital scholarly editions. At the time, the authors believed this sample to constitute "a major part of the electronic editions on the Web with free access" (Karlsson and Malm 6). Four years later, a list of 228 digital scholarly editions was compiled by Patrick Sahle, more than seven times the number studied by Karlsson and Malm (Sahle). In 2011, if the apparent trend has continued, there may be upwards of a thousand scholarly editions online. A complete survey of digital scholarly editions has therefore not been feasible for this study. Instead, purposeful sampling has been employed on fifteen editions of interest. The list of editions chosen can be seen in fig. 39, and include Cædmon's Hymn, the Codex Sinaiticus, the Diary of Samuel Pepys, the Newton Project, Vincent van Gogh: The Letters, and others.

This sample comprises editions that have been noted in the literature as being innovative, as well as several that have not received much attention but that seem different from the others. The sampling method might thus be characterized as maximum variation sampling, and has been conducted in order to obtain a sense of the full range of functionalities and implementations that have been realized to date. Maximum variation sampling can yield two sorts of findings: "(1) high-quality, detailed descriptions of each case, which are useful for documenting uniquenesses,



and (2) important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity” (Patton 235). Both of these sorts of findings have been sought and found in the current study.

## Method

As the aim of the study is to examine not just *what* functionalities have been implemented in digital scholarly editions, but also *how* they have been implemented, a mixed quantitative/qualitative approach is most appropriate. As in the previous chapter, the method known as “document analysis” will be employed, although in this case a different analytical apparatus will be used, this one designed specifically to compare digital editions with each other from a functional perspective. The examination and interpretation of scholarly editions has been accomplished by means of an application of the analytical apparatus described above (under “Identification of Functionalities”) to each of the editions under consideration. This has been done by identifying and testing each of the functionalities in each of the editions. Results are recorded so as to be quantifiable, but freeform descriptions of each digital scholarly edition and the affordances it offers have also been created, to allow for a thorough understanding of each edition.

## Results

### Navigation: Browsing

As expected, every digital scholarly edition implements some method of browsing. All editions offered as their primary means of browsing either hyperlinks grouped into various categories, or dropdown menus. Categories serving to group the material may be derived from either the structure of the text itself, or from the material of a particular physical edition of a work. In some cases, both ways of categorizing are used, as in *Codex Sinaiticus*, which uses dropdown menus to create navigable categories for book, chapter, and verse, but also ones for quire, folio, and recto (see fig. 16).

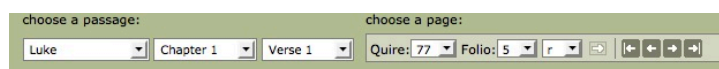


Figure 16: Browsing in *Codex Sinaiticus* (Milne et al.)

In other cases, browsing may be done by subject, as in the *Newton Project*, which divides its textual materials into twenty subject-based categories. *Vincent van Gogh: The Letters* implements hyperlinks within glossaries, concordances, and by various entities that have been encoded within the work and presented as lists, including works of art mentioned in the letters, literature cited by Van Gogh, and people mentioned in the correspondence (see fig. 17). It also provides a horizontal list of previously visited pages as part of the navigation menu, allowing recently browsed entries to be easily revisited with a single click.

Number in edition 1952-1954				
Number in this edition (2009)				
Number in edition 1990				
Date				
				Language
001	<u>001</u>	001	Sunday, 29 September 1872	Dutch
002	<u>002</u>	002	Friday, 13 December 1872	Dutch
003	<u>003</u>	003	mid-January 1873	Dutch
004	<u>004</u>	004	Tuesday, 28 January 1873	Dutch
005	<u>005</u>	005	Monday, 17 March 1873	Dutch
006	<u>006</u>	006	Monday, 24 March 1873	Dutch
007	<u>007</u>	007	Monday, 5 May 1873	Dutch
008	<u>008</u>	008	Friday, 9 May 1873	Dutch
009	<u>009</u>	009	Friday, 13 June 1873	Dutch
009a	<u>010</u>	010	Wednesday, 2 July 1873	Dutch
010	<u>011</u>	011	Sunday, 20 July 1873	Dutch
010a	<u>012</u>	012	Thursday, 7 August 1873	Dutch
011	<u>013</u>	013	Saturday, 13 September 1873	Dutch
011a	<u>014</u>	014	between about Thursday, 16 October and Friday, 31 October 1873	Dutch

Figure 17: Concordance in *Vincent van Gogh: The Letters* (Jansen et al.)

Most editions also make it possible to browse by clicking “Back” and “Next” or similarly labeled buttons that allow leafing through a work in linear order, as in a printed book.

A few editions allow innovative means of browsing. *William Godwin’s Diary* is notable in this respect due simply to the sheer number of categories with which it is possible to browse; “Diary,” “People,” “Events,” “Reading,” “Writing,” “Meals,” and “Meetings” have all been identified in the text and have been implemented as browsable categories. Each is subdivided into two to sixteen subcategories, some of which are further subdivided, allowing browsing and comparison of precise concepts that users may not have even considered (see fig. 18).

**William Godwin's Diary**  
**Reconstructing a Social and Political Culture 1788-1836**

Welcome to the digital edition of the diary of William Godwin (1756-1836). Godwin's diary consists of 32 octavo notebooks. The first entry is for 6 April 1788 and the final entry is for 26 March 1836, shortly before he died. The diary is a resource of immense importance to researchers of history, politics, literature, and women's studies. It maps the radical intellectual and political life of the late eighteenth and early nineteenth centuries, as well as providing extensive evidence on publishing relations, conversational coteries, artistic circles and theatrical production over the same period. One can also trace the developing relationships of one of the most important families in British literature, Godwin's own, which included his wife Mary Wollstonecraft (1759-1797), their daughter Mary Shelley (1797-1851) and his son-in-law Percy Bysshe Shelley (1792-1822). Many of the most important figures in British cultural history feature in its pages, including Anna Barbauld, Samuel Taylor Coleridge, Charles James Fox, William Hazlitt, Thomas Holcroft, Elizabeth Inchbald, Charles and Mary Lamb, Mary Robinson, Richard Brinsley Sheridan, William Wordsworth, and many others.

The diary has been transcribed and encoded so that it is fully searchable. High resolution scanned images of the diary are also provided.

Those new to the resource are encouraged to refer to the [Introduction to the Resource](#) and to the section about [searching](#) the site. The diary is part of the Abinger Collection of manuscripts held in the Bodleian Library. For further details, see [Abinger Collection](#).

If you have questions, comments or suggestions on the website feel free to send them to: [godwin.diary@politics.ox.ac.uk](mailto:godwin.diary@politics.ox.ac.uk). You may also follow [@godwindiary](#) on twitter for excerpts from the diary.

The Department of POLITICS and INTERNATIONAL RELATIONS  
 The Leverhulme Trust  
 Bodleian Libraries UNIVERSITY OF OXFORD  
 Oxford University Computing Services

Figure 18: Browsing in *William Godwin's Diary* (O'Shaughnessy et al.)

*Perseus* allows browsing within and between books by means of a series of rectangles at the top of each page of text representing books or sections of books (see fig. 19). This allows users to better understand where they are in a given text, and to navigate anywhere else in the work with a single click.



Figure 19: Browsing by bars in *Perseus Digital Library* (G. R. Crane et al.)

*Perseus* also uses an open-access service created by the Ancient World Mapping Center and Institute for the Study of the Ancient World called "Pleiades" that produces both a map and a graph of all places mentioned in a particular text. The graph contains links that display information about where in the text the places are mentioned, which link back to mentions of the places themselves within the text, thus creating a method of browsing by means of the data itself (see fig. 20).

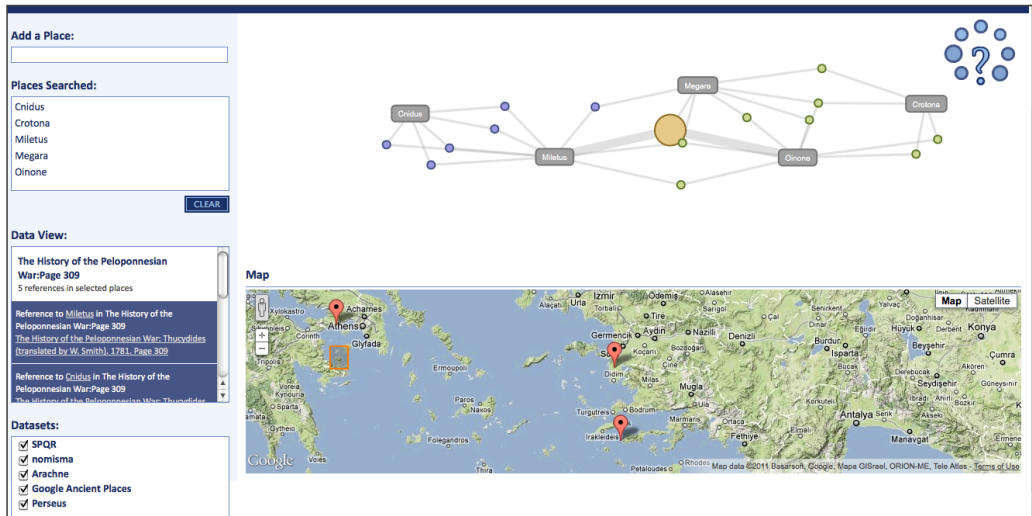


Figure 20: Browsing by data map in *Perseus Digital Library* (Gregory Crane et al.)

### Navigation: Searching

Thirteen of the fifteen editions implement some form of search, the only exceptions being the *Online Chopin Variorum Edition* and the *Aberdeen Bestiary*. It may be speculated that the former has omitted search due to the non-textual nature of its subject matter, whereas the latter may have considered it unnecessary due to the relatively small size of the resource.

The implementations that do exist involve various levels of search functionality, ranging from a simple box to a page of options. The simplest form of search on this scale can be found in the *Walt Whitman Archive*, which provides a simple Google Custom Search box without any options. A note mentions that they are exploring options for more sophisticated searching (see fig. 21).

## Search the Archive

A note about the *Whitman Archive* search: We are currently exploring several options for enabling more sophisticated searching of *Whitman Archive* materials, including faceted searching/browsing and more powerful leveraging of our deep mark-up. We appreciate your patience as we pursue these options.



**Figure 21: Search in the *Walt Whitman Archive* (Folsom et al.)**

A more complex search implementation is present in the *Rossetti Archive*, which includes a number of options including case sensitive, Boolean, phrase, genre, name, and date searches, including date ranges. Additionally, searching can be limited to all archive objects, texts, or images (see fig. 22).

home | about the archive | exhibits & objects | search engine | bibliography | nines

recent searches: \_\_\_\_\_

### Rossetti Archive Search

**free form search** [help](#)

\_\_\_\_\_ case sensitive:  \_\_\_\_\_ search

**structured searching**

**title search** [help](#)

\_\_\_\_\_ search

**boolean search** [help](#)

\_\_\_\_\_ and \_\_\_\_\_ case sensitive:  \_\_\_\_\_ search

**phrase search** [help](#)

\_\_\_\_\_ case sensitive:  \_\_\_\_\_ search

**genre search** [help](#)

\_\_\_\_\_ case sensitive:  in any genre \_\_\_\_\_ search

**name search** [help](#)

\_\_\_\_\_ in any role \_\_\_\_\_ search

**date search** [help](#)

all archive objects before 1911 search

all archive objects from 1280 to 1305 search

\_\_\_\_\_ in all archive objects before 1911 search

\_\_\_\_\_ in all archive objects from 1280 to 1305 search

Figure 22: Search in the *Rossetti Archive* (McGann et al.)

*Vincent van Gogh: The Letters* also has an advanced form of search, with many options including what parts of the resource to search (be they original text, translation, annotations, or bibliography), what to search for (whether person, literature, work of art, Bible reference, etc.), what particular letters or date ranges to search for, and how to order the results (i.e. by relevance, correspondent, or date) (see fig. 23).

RECALL PREVIOUS		CLEAR		SEARCH	
<b>Full text search</b>					
?	Original text	<input checked="" type="checkbox"/>			
?	Translation	<input checked="" type="checkbox"/>			
?	Annotations	<input checked="" type="checkbox"/>			
?	Bibliography	<input checked="" type="checkbox"/>			
?	Full text	<input type="text"/>			
<b>+ Search for</b>					
?	Person	<input type="text"/>			
?	Literature	<input type="text"/>			
?	Work of art	<input type="text"/>			
?	Bible reference	<input type="text"/>			
?	Van Gogh work F no.	<input type="text"/>	JH no.	<input type="text"/>	
?	Periodical	<input type="text"/>			
<b>+ Select letters</b>					
?	From Vincent van Gogh	<input checked="" type="checkbox"/>			
?	To Vincent van Gogh	<input checked="" type="checkbox"/>			
?	Sketches only	<input type="checkbox"/>			
?	Number (range)	<input type="text"/>	This edition 2009 ▾		
?	Date between	<input type="text" value="1872-09-2"/>	and	<input type="text" value="1890-07-3"/>	
?	Or period	<input type="text"/>			
?	Correspondent	<input type="text"/>			
?	Place	<input type="text"/>			
<b>+ Sort by</b>					
?	Relevance	<input type="radio"/>			
?	Correspondent	<input type="radio"/>			
?	Date	<input checked="" type="radio"/>			
RECALL PREVIOUS		CLEAR		SEARCH	

Figure 23: Search in *Vincent van Gogh: The Letters* (Jansen et al.)

*Perseus* offers perhaps the most impressive form of search, providing a plethora of options: Boolean searches that can be limited to particular sections of the archive, searches in six languages, an English-to-[Language] lookup feature that allows searching for a word in English to find its translation in other languages, a dictionary entry search that allows truncated searching and finds entries for words in five languages, as well as



named entity search tools including ones for people, places, and dates (including date ranges) (see fig. 24).

The screenshot displays the Perseus Search Tools interface. At the top, there is a navigation bar with links for Home, Collections/Texts, Research, Grants, Open Source, About, and Help. The main section is titled "General Search Tools" and includes several search options:

- Search the collections:** A search box with a language dropdown (set to English) and a "Search" button. Below it are checkboxes for "containing all of the words", "containing the exact phrase", "containing at least one of the words", and "without the words". A "Limit Search to:" section lists various materials like Greek and Roman Materials, Arabic Materials, Germanic Materials, etc.
- English-to-(Language) lookup:** A search box for finding Greek, Latin, Arabic, etc. words based on English definitions.
- Dictionary Entry Lookup:** A search box for finding words starting with "am" in Latin to find *amo*, *amarus*, *amplus*, etc.
- Art & Archaeology Search:** A search box for artifacts and/or image captions, with checkboxes for "Search artifacts" and "Search image captions".
- Named Entity Search Tools:**
  - Search places:** A search box for places, with a "Browse" button and instructions on how to use state or country names.
  - Search people:** A search box for a person, with a "Browse" button and checkboxes for "Forenames", "Surnames", and "Full name".
  - Search dates:** A search box for dates, with "From" and "To" fields for month, day, and year, and "Browse" buttons.

On the right side of the interface, there is a "How to enter text in Greek:" section with a keyboard layout and a "Word Study Tool" and "Vocabulary Tool" section.

Figure 24: Search in *Perseus Digital Library* (G. R. Crane et al.)

Even the results are heavily modifiable, with multiple options to customize how results are displayed (see fig. 25).

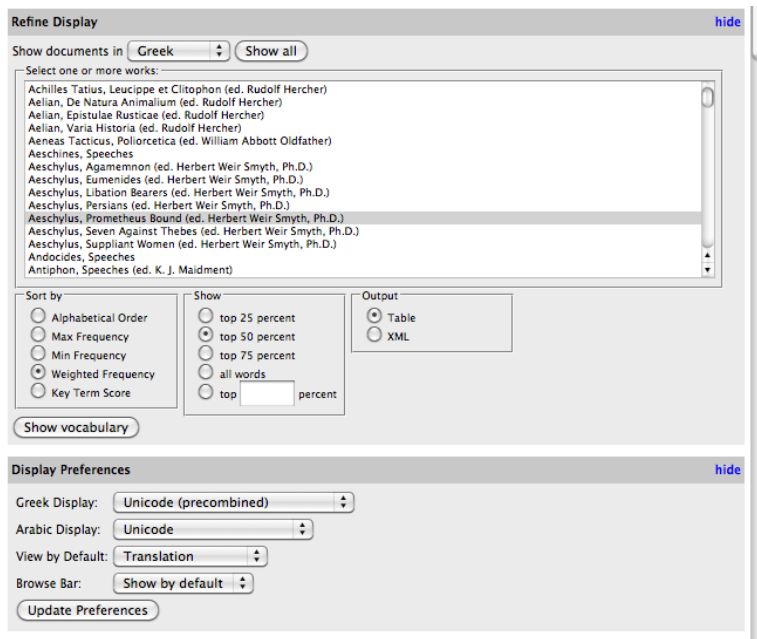


Figure 25: Refining search results in *Perseus Digital Library* (G. R. Crane et al.).

### Annotation: Private

Only one of the editions allows for full-fledged private annotation: the *Online Chopin Variorum Edition*. The *Codex Sinaiticus* does provide a bookmark feature allowing users to create bookmarks, but even this minimal functionality is in a way external to the edition, simply creating a bookmark within the user's browser. Several of the editions allow users to print out documents or to download XML versions of texts, both of which can be used to create duplicate digital or printed copies upon which private annotations could be made, but this cannot really be viewed as integrated annotation functionality, as it is not very user-friendly, and it requires the user to work on a copy of the material that is not stored within the digital scholarly edition itself.

The *Online Chopin Variorum Edition* allows notes to be created at the level of individual bars of music using a rich-text editor. Annotations can be kept private or made public. Private annotations can be viewed by browsing to them in the “Notes View.” It is noted in the Project Description that “The annotation tools provide users with unprecedented scope to construct their own 'critical commentaries' within what amounts to a uniquely 'dynamic edition'” (Rink et al.).

### **Annotation: Public**

Only two of the fifteen editions allow public annotation: the *Online Chopin Variorum Edition* and the *Diary of Samuel Pepys*.

In the *Online Chopin Variorum Edition*, all users may view user-created public annotations, but only registered users can add new ones.

(Registration is free, but requires an email address.) Public annotations can be viewed alongside scholarly commentary by the *Online Chopin Variorum Edition* team by browsing to them using the “Notes” menu.

The *Diary of Samuel Pepys* implements annotations in a manner analogous to comments on blog entries (see fig. 26).

## Tuesday 24 November 1668

Up, and at [the Office](#) all the morning, and at noon [home](#) to dinner, where [Mr. Gentleman](#), the cook, and [an old woman](#), his third or fourth wife, come and dined with us, to enquire about a [ticket](#) of his son's, that is dead; and after dinner, I with [Mr. Hosier](#) to my closet, to discourse of the business of balancing Storekeeper's accounts, which he hath taken great pains in reducing to a method, to my great satisfaction; and I shall be glad both for [the King's](#) sake and his, that the thing may be put in practice, and will do my part to promote it. That done, he gone, I to the Office, where busy till night; and then with comfort to sit with [my wife](#), and get her to read to me, and so to supper, and to bed, with my mind at mighty ease.

### Annotations

- \* [Robert Gertz](#) on Fri 25 Nov 2011, [01:58am](#). [Flag this](#)

The third or fourth wife and the son who's dead...It gets hard to keep track I guess.
- \* [Terry Foreman](#) on Fri 25 Nov 2011, [02:11am](#). [Flag this](#)

"I with Mr. Hosier...to discourse of the business of balancing Storekeeper's accounts, which he hath taken great pains in reducing to a method...that [should] be put in practice, and will do my part to promote it."

L&M note that Francis Hosier, having lately served as an accountant in the office of Navy Treasurer and studied the complexity of balancing storekeepers' accounts — involving many goods and services both at home and abroad — proposed a method of accounting, that Pepys presented to the Brooke House Committee, which was adopted in March 1669. <http://www.pepysdiary.com/archive/1669/03/07/>
- \* [Mark S](#) on Fri 25 Nov 2011, [05:37am](#). [Flag this](#)

@Robert Gertz "It gets hard to keep track I guess."

Hard for Pepys to keep track, anyway. Probably Mr Gentleman (who wasn't a gentleman) told them a long story at dinner about his family life... "I was married to so-and-so, and then she died, and then my son went to sea, then I married so-and-so, and then such-and-such happened... etc."

I'm sure it's Sam who lost track of how many wives he had, not the man himself. :-)
- \* [Don McCahill](#) on Fri 25 Nov 2011, [11:03am](#). [Flag this](#)

Remember that at this time many women died in childbirth, resulting in men with several wives. Divorce was unheard of, except for Kings and such.

Figure 26: Public annotations in *The Diary of Samuel (Gyford)*

It is therefore unsurprising, perhaps, that some of the comments tend to be rather informal. Jokes and conversations between users can be found alongside more traditional scholarly fare. However, the comments are moderated, and a warning appears in the “Annotation guidelines” that annotations should remain on topic and contribute to other’s understandings of the material. Users may flag each other’s annotations if they feel they are

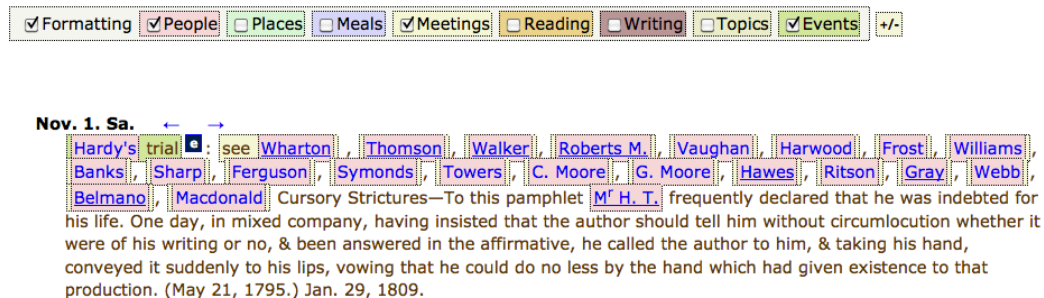
off-topic or require further work. No registration is required in order to post annotations, although a name and email address are required. It is telling, perhaps, that public annotations appear to be used much more frequently in *The Diary of Samuel Pepys* than in the *Online Chopin Variorum Edition*.

### Analytical Tools: Visualization

Four of the fifteen editions are outfitted with analytical tools to create visualizations of various kinds. Four others have minimal visualizations: either timelines or highlighted words.

*William Godwin's Diary* allows words within passages to be highlighted in different colours according to which of the entity-based filters have been selected, making it easy to find particular sorts of information (see fig. 27).

#### Diary entry for 1 November 1794



Nov. 1. Sa. ← →

Hardy's trial, see Wharton, Thomson, Walker, Roberts M., Vaughan, Harwood, Frost, Williams, Banks, Sharp, Ferguson, Symonds, Towers, C. Moore, G. Moore, Hawes, Ritson, Gray, Webb, Belmano, Macdonald

Cursory Strictures—To this pamphlet M. H. T. frequently declared that he was indebted for his life. One day, in mixed company, having insisted that the author should tell him without circumlocution whether it were of his writing or no, & been answered in the affirmative, he called the author to him, & taking his hand, conveyed it suddenly to his lips, vowing that he could do no less by the hand which had given existence to that production. (May 21, 1795.) Jan. 29, 1809.

Figure 27: Highlighting in *William Godwin's Diary* (O'Shaughnessy et al.)

Also, people (along with other entities), appear as hyperlinks within the text; clicking on them reveals a bar graph of occurrences of the entity by year

throughout the diary. Hovering over a bar in the graph shows the number of appearances over the course of a year in the diary. Clicking on a bar brings one to a chronological list of hyperlinks to instances of the person in question in the text (see fig. 28).

### Lister, Dr William

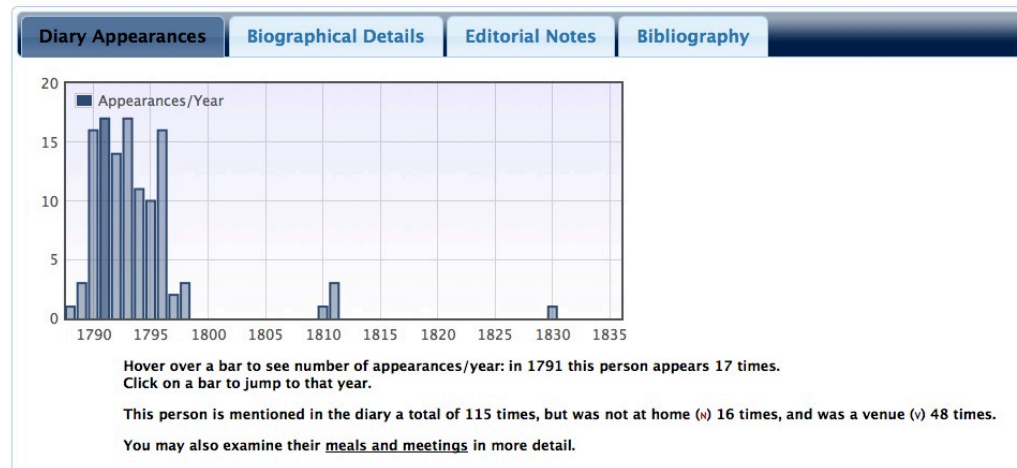


Figure 28: Graph in *William Godwin's Diary* (O'Shaughnessy et al.)

The *Walt Whitman Archive* includes a tool called TokenX that uses the text of the archive as a database from which to perform various visualizations including the creation of tables, word clouds, highlighting of words, keyword in context, replacing words with blocks, and highlighting punctuation and non-words.

*Perseus* provides a number of visualizations, including graphs of word counts by collection, maps of frequently mentioned places as a whole or by collection, graphs of word counts by language within a collection, maps of frequently mentioned places within a document, diagrams of places in a text and the particular datasets connecting them, and graphical representations

of sections of works as clickable rectangles to facilitate browsing (as shown above).

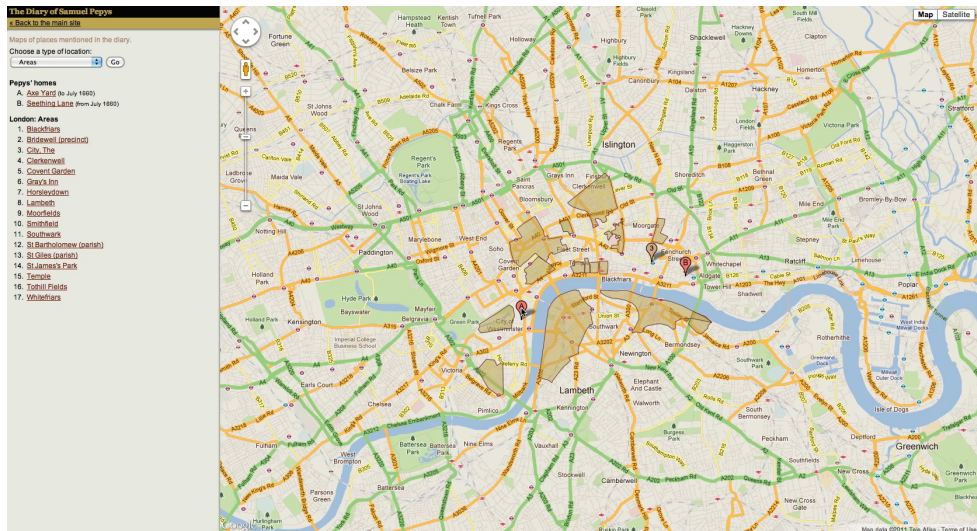


Figure 29: A map of places mentioned in the *Diary of Samuel Pepys* (Gyford)

The *Diary of Samuel Pepys* has a map of places in the diary implemented as links back to the Encyclopedia. Interestingly, clicking on places in the map creates popup dialogs with links leading back to entries for the places in the Encyclopedia; from there the user can follow links to mentions of the place in the diary itself (see fig. 29). Therefore, the map serves not only as a visualization, but also as a browsing interface.

### Analytical Tools: Textual Analysis

Six of the scholarly editions offer either tools that perform various kinds of textual analysis on the data, or the results of textual analysis.

*Vincent van Gogh: The Letters* offers a number of static lists, including a numerical overview of the letters showing ones *by* and *to* Van Gogh, a concordance comparing various published versions (as shown above), and

various other lists including people mentioned in the correspondence, literature cited by Van Gogh, and more.

*William Godwin's Diary* offers a table of overall statistics with counts of all entities that have been tagged in the diary, dates of updates, and other such information (see fig. 30).

### Godwin Project: Overall Stats

- **Diary Map Last Updated:** 2011-10-08T13:31:42.662+01:00
  - **Number of Years:** 49
  - **Number of Months:** 576
  - **Number of Days:** 17514
  - **Number of Pagebreaks:** 2597
- **Diary Files Last Updated:** 2011-10-08T13:31:35.543+01:00
  - **Number of Name Instances:** 64315
  - **Number of Identified Name Instances:** 49739
  - **Number of Unidentified Name Instances:** 14576
  - **Number of Identified Person Records:** 1214 (Males: 1021 Females: 169)
  - **Number of Identified Dramatists Records:** 317
  - **Number of Meetings:** 32366
  - **Number of Meals:** 10529
  - **Number of Placenames:** 21402
  - **Number of Venues:** 16962
  - **Number of Entertainments:** 3110
  - **Number of Events:** 6452
  - **Number of Topics:** 1527
  - **Number of Acts of Writing:** 11947
  - **Number of Acts of Reading:** 17598
- **Image Files List Last Updated:** 2011-10-08T16:31:00.493+01:00
  - **Number of Image Files:** 2695

Figure 30: Overall statistics in *William Godwin's Diary* (O'Shaughnessy et al.)

Personographies are given for people, including numbers of appearances per year, biographical details, editorial notes, and bibliographies.

The *Internet Shakespeare Editions* provides chronologies, statistics on particular texts including number of stage directions, number of speeches, average speech length, longest speech, numbers of times characters appear, etc. (see fig. 31).



### The Comedy of Errors (Folio 1, 1623)

Scene	First TLN	Last TLN	Number of stage directions	Number of speeches	Avg speech length (lines)	Longest speech (lines)
<b>Characters appearing</b>						
1.1	1	161	2	12	12.25	64
Duke, Egeon, Jailor						
1.2	162	271	6	24	3.29	10
1st Merchant, Antipholus of Syracuse, Dromio of Ephesus, Dromio of Syracuse						
2.1	272	393	3	39	2.00	14
Adriana, Dromio of Ephesus, Luciana						
2.2	394	615	4	81	1.74	36
Adriana, Antipholus of Syracuse, Dromio of Syracuse, Luciana						
3.1	616	785	4	61	1.70	21
Adriana, Angelo, Antipholus of Ephesus, Balthazar, Dromio of Ephesus, Dromio of Syracuse, Luce						
3.2	786	979	7	62	2.11	28
Angelo, Antipholus of Syracuse, Dromio of Syracuse, Luciana						
4.1	980	1102	6	41	1.88	8
Angelo, Antipholus of Ephesus, Dromio of Ephesus, Dromio of Syracuse, Officer, Second Merchant						
4.2	1103	1182	5	33	1.33	8
Adriana, Dromio of Syracuse, Luciana						
4.3	1183	1279	4	27	2.52	15
Antipholus of Syracuse, Courtesan, Dromio of Syracuse						
4.4	1280	1461	10	87	1.00	11
Adriana, Antipholus of Ephesus, Antipholus of Syracuse, Courtesan, Dromio of Ephesus, Dromio of Syracuse, Luciana, Officer, Pinch						
5.1	1462	1919	15	142	2.12	40
Abbess, Adriana, Angelo, Antipholus of Ephesus, Antipholus of Syracuse, Courtesan, Dromio of Ephesus, Dromio of Syracuse, Duke, Egeon, Luciana, Messenger, Second Merchant						

Figure 31: Section statistics in *Internet Shakespeare Editions (Best)*

Similarly, *Decameron Web* offers a PDF concordance and lists of people and places with standardized attributes.

A quick look at the preceding examples reveals that with the exception of some minimal user input to select which statistics are displayed in the *Internet Shakespeare Editions*, none of the preceding editions provide tools that allow users to input their own data or to ask their own questions. As argued by Orlandi, it is this feature that really differentiates printed from digital scholarly editions. The only two that do provide this kind of dynamic functionality are *Perseus* and the *Walt Whitman Archive*.

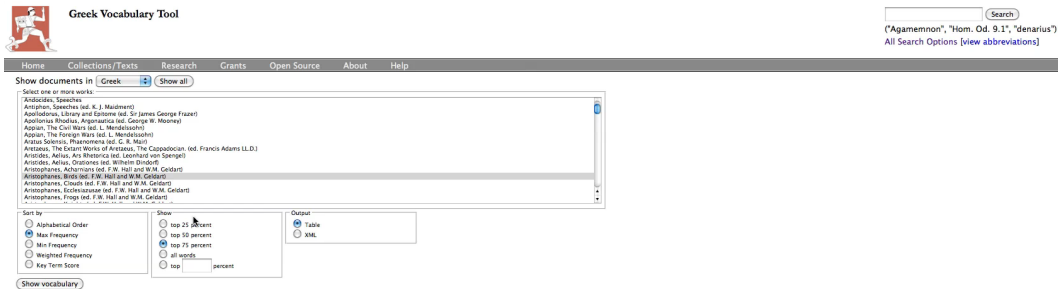


Figure 32: Vocabulary tool in *Perseus Digital Library* (G. R. Crane et al.)

*Perseus* provides not only static lists of word counts by collection, document, or language, but also advanced word study tools requiring user input that reveal grammatical information, word frequency statistics, and various other kinds of linguistic statistics (see fig. 32).

The *Walt Whitman Archive* provides a tool called *TokenX* that allows users to perform various operations on text, including generating concordances, word counts in context, word statistics, and punctuation and non-word statistics, and allows the use of Boolean expressions in doing so (see fig. 33).



**TokenX: a text visualization, analysis, and play tool**  
Customized for the *Walt Whitman Archive*.

File: "http://jetson.unl.edu:8080/cocoon/tokenxwhitman/frequency2.xml?query=love|hate|envy|fear"

**Word Frequency Database**

Enter a list of words separated by a vertical bar (e.g., 'beef|bicycle|happin\*'):

[Click here](#) to open the following data in a spreadsheet.

expand all column headings

word	1855	1860	1867	1871-72	1881-82	1891-92	1856	TOTAL
love	57	176	218	231	241	261	87	1271
hate	6	7	7	7	5	5	5	42
envy	1	3	3	4	5	6	0	22
fear	4	16	16	16	15	15	10	92

Figure 33: Text analysis tools in the *Walt Whitman Archive* (Folsom et al.)

In both *Perseus* and the *Walt Whitman Archive*, user input takes the form of word selection, choices as to filters, and sorting options. In the case of *Perseus*, options are somewhat more robust, and users can even choose what form the data that is output will take, be it table-based or XML. However, the *Walt Whitman Archive* also allows some tools for play, allowing users to substitute words for other words, as well as to replace words with images.

### Customizability: of the Interface

Only two of the fifteen scholarly editions offers no means at all by which to customize the interface: the *Diary of Samuel Pepys* and *Cædmon's*

*Hymn*. However, it may be remarked that even in these cases, the simple fact of their being implemented as modern web pages using HTML means that the font can be resized, the interface can be resized and repositioned on the screen, multiple windows can be opened allowing side-by-side comparison of different pages of the resource, colours can be altered or omitted, pages can be zoomed in on or out from, pages can be viewed without CSS or as basic HTML, etc. Therefore, it might convincingly be argued that *all* Web-based interfaces are customizable, no matter how simple they are. However, there are some methods of customization that provide added benefits if offered.

For example, the ability to compare multiple versions of a text is an important feature for many textual scholars. As Lyman writes, “Comparisons across multiple cases, strengthened by the methodological consistency with each has been recorded, have a way of surfacing patterns that bear further investigation - and speculation as to why they have occurred” (Lyman, “Assistive Potencies: Reconfiguring the Scholarly Edition in an Electronic Setting” 67). Nine of the fifteen editions under consideration allow side-by-side comparison of texts, using various methods. The *Codex Sinaiticus* allows facsimile images, transcriptions, and translations to be viewed side-by-side in a single window; additionally, the text in the image and that in the transcription are interlinked, so that selecting a word in the transcription highlights it in the image as well (see fig. 34).

The screenshot displays the 'Codex Sinaiticus' website interface. At the top, there is a navigation bar with 'HOME', 'ABOUT CODEX SINAITICUS', 'ABOUT THE PROJECT', and 'SEE THE MANUSCRIPT'. A search bar is located on the right. Below the navigation bar, there are options to 'choose a passage:' (John, Chapter 1, Verse 1) and 'choose a page:' (Quire: 80, Folio: 1). There are also 'display options:' for Image, Transcription, Translation, and Physical Description. The main content area is divided into two panels: 'Image' on the left showing a facsimile of the manuscript page with Greek text, and 'Transcription' on the right showing the corresponding text in Greek and English. The English translation is: '1:1 In the beginning was the Word, and the Word was with God, and the Word was God. 2 He was in the beginning with God. 3 All things came into being through him, and without him came into being not one thing that is in being. 4 In him is life, and the life was the light of men. 5 And the light shines in darkness, and the darkness comprehended it not. 6 There came a man, sent from God; his name was John:'. The interface also includes a sidebar with language options (English, Duitsch, Ελληνικά, Русско) and a footer with logos for DFG, Arts & Humanities Research Council, and RSS.

Figure 34: Facsimile and transcription linking in *Codex Sinaiticus* (Milne et al.)

The screenshot displays the 'Vincent van Gogh: The Letters' website interface. At the top, there is a navigation bar with 'VAN GOGH MUSEUM AMSTERDAM' and 'Huygens Institute-KNAW'. The main content area is divided into several sections: 'Vincent van Gogh The Letters' with search options (by period, by correspondent, by place, with sketches), 'Search' (keyword or number(s)), 'Van Gogh as a letter-writer' (Correspondents, Biographical & historical context, Publication history), and 'About this edition' (Chronology, Concordance, lists, bibliography, Book edition). Below these sections, there is a search bar for '201' and a list of search results. The first result is '201 To Theo van Gogh. The Hague, Saturday, 21 January 1882.' The interface also includes a sidebar with language options (original text, line endings, facsimile, translation, notes, artworks) and a footer with logos for Van Gogh Museum and Huygens Institute-KNAW.

Figure 35: Interface customization in *Vincent van Gogh: The Letters* (Jansen et al.)

*Vincent van Gogh: The Letters* has a maximum of four columns, three of which can be customized to display one of six sorts of information. Here we can see the interface being customized to enable comparison of various types of information (see fig. 35).

Other editions, such as the *William Blake Archive*, simply open links to alternate versions in popup windows, using the functionality of the browser to provide the ability to compare versions (see fig. 36). Despite its simplicity, this method actually allows for maximum freedom in positioning different items.

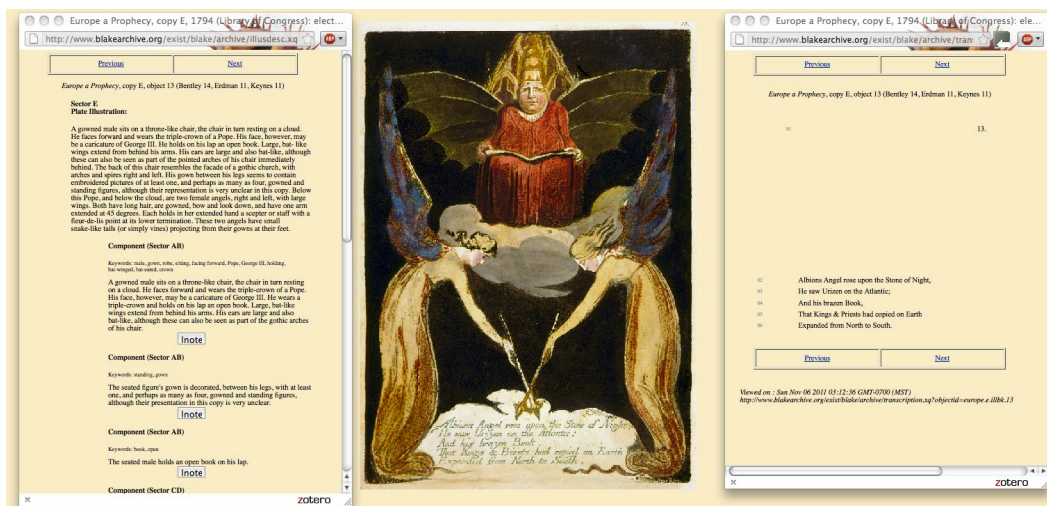


Figure 36: Pop-up window comparisons in the *William Blake Archive* (Eaves, Essick, and Viscomi)

Another important feature relating to customization pertains to the presence of high-resolution images that can be zoomed in on and panned to reveal detail. Eleven of the fifteen editions contain images that cannot be viewed in their entirety on a 1680 x 1050 resolution screen without panning

or zooming out. Of the three others, two give images in low enough resolution that zooming and panning is not required, whereas one does not contain images.

Other means of interface customization include the provision of different translations of the interface itself; the *Codex Sinaiticus* is the only one to do this, making its interface available in four languages. Interface elements may be capable of being positioned in different places, such as in *Vincent van Gogh: The Letters*, where there is a maximum of four columns, three of which can be customized to display one of six sorts of information. In some cases, tools can be hidden, allowing the text to be viewed without distraction, as in the *Decameron Web*, in which it is possible to hide text labels that contain metadata, in *William Godwin's Diary*, where the calendar can be turned off, in the *Online Chopin Variorum Edition*, in which labels on musical bars can be removed, or in *Perseus*, where unneeded toolbars can be collapsed.

### **Customizability: of the Content**

Customizability of content comes in three major forms: the provision of multiple versions of a text in one language, the provision of translations of a text, and the provision of multimedia versions of a text or other artefacts related to it.

With regard to multiple versions of a single text, eight editions provide this functionality (excluding ones that offer only transcriptions or translations alongside facsimiles). Interesting examples include the *Newton*

*Project*, which provides both diplomatic and normalized versions of texts, the former offering little editorial intervention, and the latter offering a “tidied-up” text in which abbreviations are expanded and mistakes corrected (see fig. 37).

**College Notebook**  
by Isaac Newton

Source: MS Add. 4000, Cambridge University Library, Cambridge, UK

[Switch to diplomatic text](#) ⓘ

Download [XML](#) and [schema](#) (advanced users only)

▶ Additional Metadata

---

⌂

**Of the extraction of Pure Square Cubick. Square-square & square-cubick rootes &c**

Let the number whose roote is to be extracted bee pointed making the first point under the {unite} & comprizeing soe many numbers under each point as the number hath dimensions as if the number be square-cube tis thus pointed 57086352410802

Then out of the figures of the first point next the left hand extract the greatest roote proper to the power of the number & set that downe in the Quotient which is the first side & is called A. (as the roote quintuplicate of 5708 is {5}, & {5} quintuplicate is 3125 ) then taking that roote duely multiplied out of the number (as 3125 out of 5708) with the rest of the numbers to the next point. seeke the seacond side which is found by divideing that number by another number made out of the first side (which is called the Divisor) & this second side I name E. (thus by divideing 258363524 by 5 A qq +10 A c +10 A q +5 A after such a maner that 5 A qq E +10 A c E q +10 A q E c +5 A E qq +E qc may be contained in the number the product of that division shall be E =

⌂

**The extraction of the square roote**

The square to be resolved	29	16	{54 The Product
The square of the first side	25		be taken away
The rest of the sqare to be	4	16	resolved
The divisor for finding the seacond	1	0	sidie. which is the first side doubled
The rectangle by 2A and E	4	0	} to be subtracted
The square of E		16	
The sumæ of the rectangles	0	16	to be subducted
	0	00	The remainder

**College Notebook**  
by Isaac Newton

Source: MS Add. 4000, Cambridge University Library, Cambridge, UK

[Switch to normalized text](#) ⓘ

Download [XML](#) and [schema](#) (advanced users only)

▶ Additional Metadata

---

⌂

**Of y<sup>e</sup> extraction of \Pure/ Square Cubick. Square-square & square-cubick rootes &c**

Let y<sup>e</sup> number whose roote is to be extracted bee pointed ~~bee~~ making y<sup>e</sup> first point under y<sup>e</sup> {unite} & comprizeing soe many numbers under each point as y<sup>e</sup> number hath dimensions as if y<sup>e</sup> number be square-cube tis thus pointed 57086352410802

Then ~~then then~~ out of y<sup>e</sup> figures of y<sup>e</sup> first point next y<sup>e</sup> left hand extract y<sup>e</sup> greatest/ roote proper to y<sup>e</sup> power of y<sup>e</sup> number & set y<sup>e</sup> downe in y<sup>e</sup> m{illeg} Quotient w<sup>ch</sup> is y<sup>e</sup> fir{illeg} {sic} side & is called A. (as y<sup>e</sup> roote quintuplicate of 5708 is {5}, & {5} quintuplicate is 3125) y<sup>n</sup> taking y<sup>e</sup> roote duely multiplied out of y<sup>e</sup> number (as 3125 out of 5708) w<sup>th</sup> y<sup>e</sup> rest of y<sup>e</sup> numbers to y<sup>e</sup> next point. seeke y<sup>e</sup> seacond side w<sup>ch</sup> is found by divideing y<sup>e</sup> number by another number made out of y<sup>e</sup> first side (w<sup>ch</sup> is called y<sup>e</sup> Divisor) & this second side I name E. (thus by divideing 258363524 by 5 A/ qq +10 A c +10 A q +5 A/ after such a mane {sic} y<sup>t</sup> 5 A qq E +10 A c E q +10 A q E c +5 A E qq +E qc may be contained in y<sup>e</sup> number y<sup>e</sup> product of y<sup>e</sup> division shall be E =

⌂

**The extraction of y<sup>e</sup> sqare {sic} roote**

The square to be resolved	29	16	{54 The Product
The square of the first side	25		be taken away
The rest of the sqare to be	4	16	resolved
The divisor for finding the seacond	1	0	sidie. which is the first side doubled
The rectangle by 2A and E	4	0	} to be subtracted
The square of E		16	
The sumæ of the rectangles	0	16	to be subducted
	0	00	The remainder

Figure 37: Normalized and diplomatic versions in *The Newton Project* (Iliffe et al.)

The *Princeton Dante Project* offers summaries of works using popup windows that can be viewed alongside (or in lieu of) texts. *Vincent van Gogh: The Letters* offers versions of its texts with or without the original line breaks (and accompanying numbering).

As to multiple languages, six editions provide texts (as opposed to interfaces) in more than one language. The *Walt Whitman Archive* is



interesting in this regard, providing in addition to the original English texts ones in German, Portuguese, Russian, and Spanish. *Perseus* offers most of its texts in their original languages with various options as to the display of the script, as well as in English translation. It might be noted that as in the case of fonts and colours as mentioned in the “Customizability: of the Interface” section, translations can often be done of works on the fly using tools that come standard in modern browsers. However, such translations are generally unsuitable for scholarly purposes.

With respect to multimedia, all editions offer facsimile images of texts with the exception of the *Princeton Dante Project* and *The Diary of Samuel Pepys*, both of which do offer some other images. Therefore, if images are considered to be a separate medium than text, every edition is a multimedia edition. As to other forms of media, the *Princeton Dante Project* offers audio recitations of works in both English and Italian, *Decameron Web* offers medieval music from the time of Boccaccio, the *Walt Whitman Archive* contains a single audio recording of what is thought to be Whitman reading one of his own poems, and *Internet Shakespeare Editions* offers a number of audio performances of Shakespeare. Video is surprisingly scarce; the *Internet Shakespeare Editions* contains a single one minute and six second video performance of a scene from “King John,” and *Decameron Web* contains a link to a YouTube video of a cinematic adaption of the material.

## Aggregated Results

The table on the following page (fig. 38) represents a summary of results. As to navigation, methods of browsing have seen universal implementation across all of the scholarly editions under consideration, whereas methods of searching have not. Additionally, even among those editions that do offer search capabilities, some implementations are very simple, and do not provide many options to the user. Therefore, as to Lyman's contention that search represents a more revolutionary method of navigating scholarly editions than does browsing, it might be said that scholarly editions are well on their way to this point, but have not reached it yet.

As to public and private annotation, both are extremely rare. The general lack of facilities for private annotation seems to run counter to Blair's argument for the historical importance of note-taking, and appears to be a step down in functionality from printed editions. As for public annotation, Shillingsburg's idea that the future of digital scholarly editions lies in a collective edition contributed to by a community of scholars still appears to be a long way off in terms of general uptake.

With regard to analytical tools, it appears that about half of the electronic editions studied are using their digital status for algorithmic operations, as per Orlandi, although not all give the user control over this process.

With regard to customizability, interface customization fares better than customizability of content; the inclusion of multimedia elements other than images is particularly rare. The fluidity of the medium so lauded by Bolter thus seems well represented in some respects, but absent in others.

	Aberdeen Bestiary	Diary of Samuel Pepys	Caedmon's Hymn	Rossetti Archive	The Newton Project	William Godwin's Diary	Online Chopin Variorum Edition	Perseus Digital Library	Princeton Dante Project	William Blake Archive	Codex Sinaiticus	Decameron Web	Internet Shakespeare Editions	Vincent Van Gogh: The Letters	Walk Whitman Archive	Totals
Annotation: public	0	4	0	0	0	0	4	0	0	0	0	0	0	0	0	2 out of 15 = 13.33%
Annotation: private	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	2 out of 15 = 13.33%
Customizability of the content: multimedia (excluding images)	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4 out of 15 = 26.67%
Customizability of the content: multiple languages	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	6 out of 15 = 40.00%
Analytical tools: for textual analysis	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	6 out of 15 = 40.00%
Analytical tools: visualization	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	8 out of 15 = 53.33%
Customizability of the Interface: side-by-side comparison	4	0	4	0	0	0	4	0	0	0	0	0	0	0	0	9 out of 15 = 60.00%
Customizability of the content: multiple versions (excluding translations)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9 out of 15 = 60.00%
Customizability of the Interface: zoomable images	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	11 out of 15 = 73.33%
Customizability of the Interface: other	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	11 out of 15 = 73.33%
Navigation: searching	0	4	4	4	4	4	0	4	4	4	4	4	4	4	4	13 out of 15 = 86.67%
Navigation: browsing	4	0	0	0	0	0	4	4	4	4	4	4	4	4	4	15 out of 15 = 100.00%
<b>Totals</b>	<b>2 out of 12 = 16.67%</b>	<b>4 out of 12 = 33.33%</b>	<b>4 out of 12 = 33.33%</b>	<b>4 out of 12 = 33.33%</b>	<b>5 out of 12 = 41.67%</b>	<b>6 out of 12 = 50%</b>	<b>7 out of 12 = 58.33%</b>	<b>7 out of 12 = 58.33%</b>	<b>7 out of 12 = 58.33%</b>	<b>7 out of 12 = 58.33%</b>	<b>8 out of 12 = 66.67%</b>	<b>8 out of 12 = 66.67%</b>	<b>8 out of 12 = 66.67%</b>	<b>9 out of 12 = 75%</b>	<b>10 out of 12 = 83.33%</b>	

Figure 38: Summary of Results for Chapter 3

## Theoretical Interpretation

Two theories of new media investigated in the first chapter were applied to specific editions in the second. For analyzing the results of the third chapter, McLuhan's ideas may prove useful. A perusal of the aggregated results of the third chapter shows that public annotation is extremely scarce, with only two editions out of fifteen offering it. Marshall McLuhan's global village (and Shillingsburg's village of scholars) thus does not seem to have been widely implemented yet, although the mere fact that most of these editions are freely accessible over the Internet can be interpreted to mean that the products of scholarship, if not the ability to take part in its creation, are becoming much more of a global commodity.

McLuhan's idea that new media would allow creators to "play back the materials of the natural world" (McLuhan 59) seems to have seen much wider implementation, at least insofar as images are concerned. As to other multimedia, the number is much lower, although it should be remembered that in some cases there may be no relevant multimedia materials to include.

As to McLuhan's idea that new media grants the freedom to create nonlinear logics (85), all of the editions that we have examined allow methods of rapid browsing that give users the opportunity to explore works by creating their own pathways through them. The vast majority of editions (86.86%) also offer search capabilities, allowing users to make direct discoveries in a decidedly nonlinear way.

Finally, McLuhan's contention that more holistic apprehensions of objects and ideas will replace mechanical modes of thinking (86) seems readily apparent in those editions that have provided tools for text analysis and visualization, approximately 40% and 53% respectively.

## Conclusion

In the years since Karlsson and Malm conducted their study, scholarly editions have become much more plentiful. Karlsson and Malm's contention that digital scholarly editions merely remediate printed ones can be seen to be a truism if Bolter and Grusin's theory is examined comprehensively; as we learned in the first chapter, they clearly state that "all mediation is remediation" (255). As to the question of whether or not digital scholarly editions are *revolutionary*, it seems clear that although all of the functionalities available in the digital medium are not implemented in every scholarly edition, or even in any one, it is nevertheless the case that the functionalities offered by even the simplest amongst them are vastly different from those of printed scholarly editions. If one is willing to call any change of medium "revolutionary," then surely this one is deserving of the title. The fact remains, however, that the full impact of this revolution will not be felt until the designers of digital scholarly editions begin to use the tools at their disposal to their full capacity.

## Conclusion

In this thesis, we have examined scholarly editions from three independent but complementary perspectives. In these concluding remarks, an attempt to reflect on these perspectives will be made, and to use them to answer our research questions.

Two of the theories of new media investigated in the first chapter were applied to specific editions in the second. It was found that two reasons for the continued existence of printed scholarly editions are that they can enable transparent immediacy, one of Bolter and Grusin's two types of remediation, as well as the database, one of Manovich's two main forms of cultural expression. In the third chapter, it was found that a number of McLuhan's observations and predictions regarding new media have been realized in digital scholarly editions, some more fully than others.

So, how does this help us to answer our research questions? Our studies have certainly not been exhaustive; it seems likely that were we to examine more hybrid editions in the second chapter, more advantages of printed editions could be found; and there are certainly more features of digital editions that could be isolated and analyzed in the third chapter. Likewise, there are more theories of new media than those examined in the first chapter, and applying them to scholarly editions could well prove illuminating. However, it seems apparent from our limited investigations that printed scholarly editions hold a number of advantages over digital ones, and so the widely held idea that printed editions are obsolete appears to be

overstated. On the other hand, the screen does provide a number of exciting opportunities for new types of editions never before imagined, and provides novel possibilities both for new kinds of scholarly activity as well as for the enhancement of our abilities to engage in old kinds of scholarship.

So, are digital scholarly editions “superior” to printed ones? If the question is this broad, then the answer must be a resounding “no.” Are digital editions superior to printed ones for certain purposes? This question may be answered in the affirmative, but the same may be said for printed editions.

A better question, then, is whether the advantages of digital scholarly editions are so great that they eclipse whatever more modest benefits can be derived from printed ones. Will the relationship between printed and digital editions be analogous to that between radio and television, with the latter superseding the former as the principal form of broadcasting but never entirely replacing it, or will it be more similar to that between the telegraph and the telephone, with the former all but disappearing, interesting only among hobbyists or as a museum piece?

Robert Coover mused about the end of books in general in 1992, wondering if the “proliferation of books and other print-based media, so prevalent in this forest-harvesting, paper-wasting age, is... a sign of its feverish moribundity, the last futile gasp of a once vital form before it finally passes away forever, dead as God” (Coover). For Coover, the impetus propelling us toward use of the new medium was the promise of hypertext as



a revolutionary new mode of writing that would displace the old: “criticism, like fiction, is moving off the page and on line, and it is itself susceptible to continuous changes of mind and text. Fluidity, contingency, indeterminacy, plurality, discontinuity are... fast becoming principles, in the same way that relativity not so long ago displaced the falling apple” (Coover). Coover’s principles seem especially applicable in the case of scholarly editions, which can be seen as being closer to fluid and indeterminate collections rather than linear and clearly defined totalities.

Catherine C. Marshall is more circumspect than Coover, noting that there have been waves of thinkers commenting on the future of books, “each wave... heralded by hyperbolic claims about the disappearance of the print book, the death of text, and other ways in which literacy would be forever changed” (Marshall 1). She notes that such predictions have failed to materialize not because reading from screens has not become popular, but rather because no single way of reading has “won out” over all the others. Instead, new forms of reading are simply added to the old, leading Marshall to declare that it is now the case that “reading is a hybrid” of various activities and media (Marshall 167).

Reg Carr, Director of University Library Services and Bodley’s Librarian at Oxford, also predicts a hybrid future for books in his influential “Towards the hybrid library: the national perspective in the UK,” in which he popularizes the term “hybrid library.” He offers a functional definition of libraries as “services which provide organised access to the intellectual

record, wherever it resides” (R. Carr), and then claims that since this record is located in both physical and digital spaces, “the 'hybrid' library of the future will be a managed combination of physical and virtual collections and information resources” (R. Carr).

Scholars without a vested interest in either printed or digital media are likely to approve of the idea of a hybrid environment in the context of digital editions, as it provides a wider range of personal freedom in the pursuit of one’s research. Ideally, we would be able to access scholarly editions in both media, as one may be more useful than another depending on the particular usage scenario. Why not have multiple versions of an edition rather than just one, even if some of them are not as useful as others in most situations?

Some editors of scholarly editions have in fact gone this route, attempting to appeal to a diversity of potential users by producing editions in a wide variety of formats. For example, the *Autobiography of Mark Twain, Volume 1* has not only been published as a Web-based edition (see fig. 39) and as a hardcover printed book (see fig. 40), but also as an audiobook (in a variety of formats, including MP3 (see fig. 41), MP3 CD, audio CD, Audible, preloaded digital audio player, and audiocassette), an eBook (in secure PDF (see fig.42), ePub, and Kindle formats), and as a microfilm document.

The screenshot shows a web browser displaying the 'Autobiography of Mark Twain, Volume 1' website. The page has a navigation bar at the top with links for Home, Letters, Writings, Images, Biographies, and About MTPO. A search bar is located on the left side, along with a 'Go to Page' field. The main content area features a photograph of Mark Twain sitting in a rocking chair on a porch, with the caption: 'Photograph by Albert Bigelow Paine, 25 June 1906, Upton House, Dublin, New Hampshire'. Below the photo is the title 'Autobiography of Mark Twain Volume 1' and the text 'Edited by'. The footer contains links for 'Support this edition' and 'Buy books', along with copyright information: 'Mark Twain Papers | California Digital Library | UC Press | Site Index | Contact Us Copyright © 2007–12 The Regents of the University of California. All rights reserved.'

Figure 39: Web-based version of *The Autobiography of Mark Twain, Volume 1* (Anh Q. et al.)

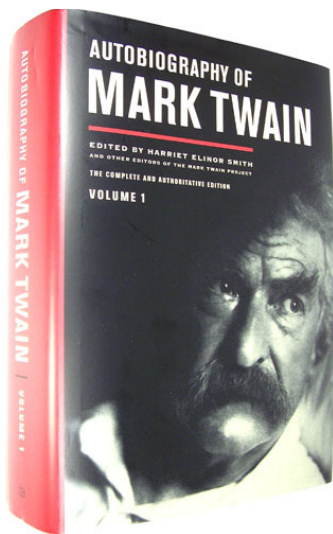


Figure 40: Printed edition of *Autobiography of Mark Twain, Volume 1* (http-mart)

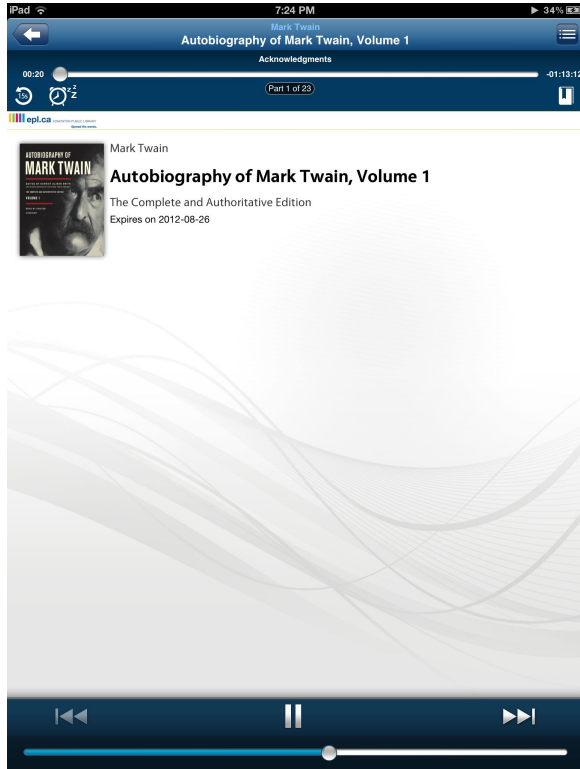


Figure 41: MP3 audiobook of *Autobiography of Mark Twain, Volume 1* (Gardner)

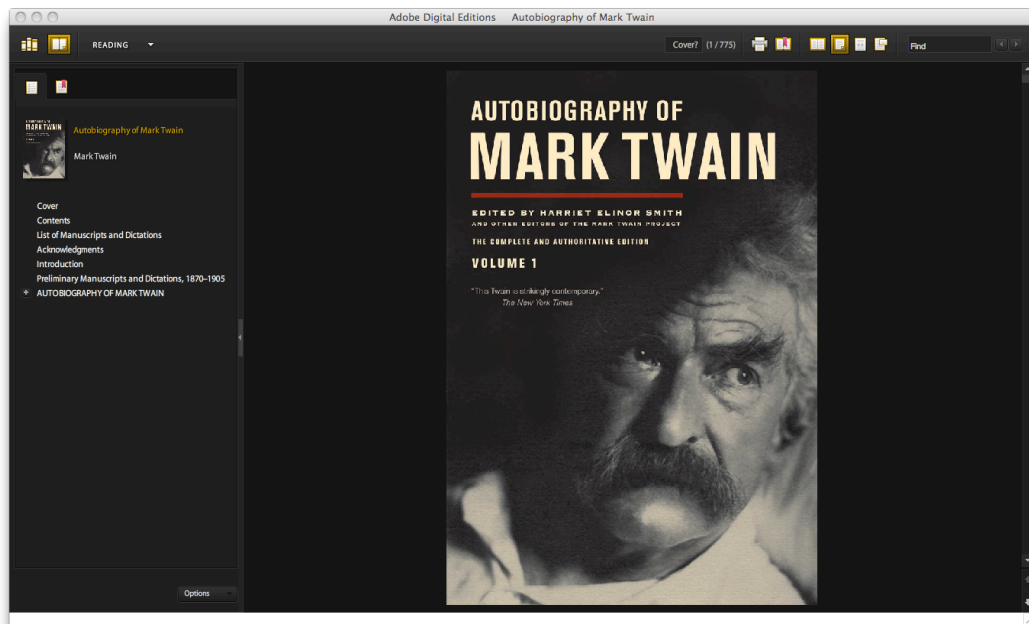


Figure 42: Secure PDF version of *Autobiography of Mark Twain, Volume 1* (Twain et al.)

These versions all possess a variety of different features, but each has been produced because it fills the needs of a specific target audience better than the others.

The ability to produce such a multiplicity of editions is certainly to be admired, although it must be mentioned that this project has had the benefit of tremendous financial resources. Financial contributions to the project have been made by the National Endowment for the Humanities as well as a lengthy list of other donors. Not every editor is so lucky, and must pick and choose among the publishing options available. Among the most important factors contributing to the decision-making process will be financial considerations. It is expensive and time-consuming to produce an edition, and it is even more so to produce multiple versions of an edition. Just as it may be desirable but impractical to produce translations of an edition in different languages, so is it unrealistic to expect the majority of editors to be able to produce versions of a particular edition in a plethora of formats. Although there may be a market for printed editions, audiobook editions, braille editions, Android or iPad editions, or others, it is simply not economically feasible for all publishers to produce them all.

Instead, it seems likely that for the immediate future the balance will continue to shift in the direction of the digital, and specifically Web-based editions. Derek Law makes this argument in relation to libraries in his "Beyond the Hybrid Library: Libraries in a Web 2.0 World," contending that

Reg Carr's notion of the hybrid library is already dated. Law calls into the question "the comfort blanket of the library as place" (Law 108) and argues that the future, or at least the one "where any salvation must lie" (Law 115), will be digital. "The question," according to Law, "is not so much what follows the hybrid library as whether, standing on the edge of the abyss, we have the self-confidence to make a great leap forward into (web) space" (Law 116).

Implications of a shift to the screen on the future of reading is a matter of some debate. Although this debate may seem new, when viewed in the context of previous shifts, it can be seen that this debate has a very long history indeed. Perhaps most famously in this context, Plato (1925) has Socrates recount a story in which the god Thamus argues to the inventor of writing Theuth that the written word begets memory loss in readers:

...this invention will produce forgetfulness in the minds of those who learn to use it, because they will not practice their memory. Their trust in writing, produced by external characters which are no part of themselves, will discourage the use of their own memory within them.  
(275a)

Similarly, in the fifteenth century Hieronimo Squarciafico complained that the invention of the printing press made books too easily available, leading to laziness, reduced memory, and diminished cognitive capacity (Ong 79).

More recently, Nicholas Carr (who also refers to the preceding two examples to bolster his argument) has argued that reading the screen is a

shallower and less intensive experience than reading from print. In his article “Is Google Making Us Stupid,” he contends that

The kind of deep reading that a sequence of printed pages promotes is valuable not just for the knowledge we acquire from the author’s words but for the intellectual vibrations those words set off within our own minds. In the quiet spaces opened up by the sustained, undistracted reading of a book, or by any other act of contemplation, for that matter, we make our own associations, draw our own inferences and analogies, foster our own ideas. Deep reading... is indistinguishable from deep thinking. (Carr)

Screen-based reading, the other hand, is “a style that puts “efficiency” and “immediacy” above all else, [and which] may be weakening our capacity for the kind of deep reading that emerged when an earlier technology, the printing press, made long and complex works of prose commonplace” (Carr).

Carr’s argument here is reminiscent of O’Donnell’s finding that people tend to remember material they read in print better than material they read from the screen. However, it goes further in that the problem being pointed out is not simply that one’s ability to remember details is weakened, but rather that one’s ability to meaningfully engage with the content even at the time of reading is undermined as well.

Whether or not one agrees with Carr’s assessment with respect to text in general, there also remains the question of the applicability of this argument to the particular case of scholarly editions. In many cases,

scholarly editions can be considered reference works, and are unlikely to be read front to back even if they are being consulted in print. Rather, users will tend to focus on sections that interest them, to follow references to other sections, to skip forward and backward to glossaries, notes, and other information, and to generally read in a non-linear fashion. This may not always be the case, and in most scholarly editions there will certainly be long sections of prose that require sustained reading, but the fact remains that scholarly editions lend themselves, by virtue of their non-linear presentation, to the kind of reading that is facilitated by a screen-based exhibition.

Another factor that makes scholarly editions different from other works is the fact that they are works of scholarship that can benefit from the input of readers. Although many kinds of text are products of personal expression and essentially consist of one-way communication from a writer to a reader, scholarly editions are often much improved by allowing contributions by readers. Greg Crane is emphatic in making this point when he writes that “We need to shift from lone editorials and monumental editions to editors as ... editors, who coordinate contributions from many sources and oversee living editions” (Greg Crane).

Crane’s appeal to produce “living editions” is interesting not only for its positive suggestions regarding a way forward for scholarly editing, but also for its unstated implication that printed editions are somehow “dead.” This implication does not seem to square with Carr’s argument that printed material allows for a deeper and livelier personal engagement with text than



does digital material. However, a parallel can certainly be drawn between Crane's idea of living editions and Plato's notion of the spoken word as "the word which is written with intelligence in the mind of the learner, which is able to defend itself and knows to whom it should speak, and before whom to be silent.... the living and breathing word of him who knows, of which the written word may justly be called the image" (Plato 276a). Perhaps Crane's exhortation to produce living digital editions can be seen as an echo of Plato's encouragement to use speech rather than writing for matters of importance. Despite the obvious differences between oral and digital communication, the rationale of both Crane and Plato for juxtaposing them both with the "dead" written word is their capacity for interactivity. This capacity is what Shillingsburg refers to when he speaks about a "village of scholars," and what McLuhan means when he talks about about a "global village."

So, are these factors enough to tip the balance in favour of the digital, and to put an end to printed scholarly editions? Perhaps, or perhaps not. Even if it were agreed that the advantages of digital editions outweigh those of printed ones to such an extent that it no longer makes sense to produce the latter, there remain a number of obstacles to a full shift. Chief among these is the fact that printed editions have a long history, and are institutionally entrenched. Careers have been built on the production and consumption of printed editions, and even if the will to change to a new model were there, the scholarly practices that have been accumulated throughout lifetimes of operating in the printed environment cannot easily be replaced.

Even if scholarly editions are a more natural fit for the digital environment than other printed works, this does not negate the fact that thus far, they have been produced exclusively in print, and switching to a new environment will be difficult, even if it is more appropriate to the task at hand. It is not only the format that needs to be changed, it is the entire scholarly infrastructure. There have been other examples of this phenomenon. It did not matter to the average person if DAT was technologically superior to audiocassette tapes, or if Betamax was superior to VHS; in both cases, the latter had better infrastructural support than the former, such that their adoption was not warranted for most people (Schofield). It took a much bigger technological leap, to CDs and DVDs, to persuade the majority of people to adopt new formats. As a caveat, however, two differences between these formats and that of print should also be remembered; first, that these formats became culturally entrenched despite having had extremely short lifespans when compared with the medium of print; and second, that they were principally used for non-scholarly purposes, and changing from them did not impact scholarly or professional practices nearly as much as a change from printed to digital editions would do for humanities scholars.

As an example of a scholarly practice that would have to be changed, we can return to our discussion of collaboration. In this respect, humanities scholars have tended to be particularly hesitant to change their ways; the ideal of the lone scholar is a difficult one to shake. From an aversion to

writing papers (or even accepting them for presentation at conferences) with coauthors to a reticence to accept interdisciplinarity, humanities scholars have traditionally shunned collaborative activity. As Christine Borgman writes,

While the digital humanities are increasingly collaborative, elsewhere in the humanities the image of the “lone scholar” spending months or years alone in dusty archives, followed years later by the completion of a dissertation or monograph, still obtains. Students often are discouraged from conducting dissertation research under a faculty grant. Instead, they are expected to spend yet more time identifying funding for solo research. When one is groomed to work alone and does so for the years required to complete the doctorate, collaborative practices do not come easily. (Borgman 14)

The idea, then, of scholarly editions being transformed from authoritative and stable reference works with a single editor accountable for its content to dynamic and ever-changing “villages of scholars,” is likely to be anathema to most humanists.

Despite these considerable obstacles, there is reason to believe that humanists *will* eventually embrace digital means of dissemination and consumption of scholarly editions. As mentioned in Chapter 3, digital scholarly editions have seen exponential growth since their inception, and this trend appears to be continuing. Some editions are being released only on the Web, including a number of those mentioned in Chapter 3 (such as the

Online Chopin Variorum Edition, the Diary of Samuel Pepys, and others).

This should not be overly surprising given the large advantages over print that the digital medium holds in certain areas, as we have seen in previous chapters. Just as shifts in media have occurred in other fields, there is no reason to believe that scholarly editing is immune to this phenomenon. And in fact, scholarly editions have already experienced some changes in media; they are no longer being produced as manuscripts, for example, even though that medium may hold certain advantages over print, such as in flexibility of page layout across and throughout editions, the ability to incorporate idiosyncratic elements and designs, and the ability to make changes and annotations after publication over time. The introduction of modern photographic facsimile editions constitutes a more recent example of a pre-digital shift in medium.

So, will printed editions disappear? At present only educated guesses can be made. However, it seems clear that if printed scholarly editions *are* destined to fade away in the face of superior technology, it has not happened yet, and they still hold a central place in the humanities scholar's toolkit.

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