A Guide to Digital Medieval Studies in North America

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1. Introduction

1 What impact have the Digital Humanities had on North American medieval studies? What are the leading North American digital projects? What theoretical trends drive this activity, and what tools and resources have been developed to execute these projects? This review article is an attempt to account for the dynamic role digital technology plays in medieval studies through an examination of scholarly debates and projects of digital medievalists in Canada and the United States. The body of literature is quickly growing, and the field constantly adapts to new technologies. This guide serves as a report of the main trajectories that have guided digital medievalists in especially the last fifteen years. As a methodological approach I have examined established and emerging journals and scholarly blogs, university programs of study, programs of the main medievalist conferences, online tools for scholarly editing, and websites devoted to digital editions of medieval texts. Gathering the material for this survey, I was struck by how seldom I was required to access a printed document, a fact that speaks right away to the momentum of Digital Humanities in North American medieval studies.

2 To begin with, defining Digital Humanities is no simple task; its essence changes from project to project, year to year, person to person\(^1\). A website has been devoted exclusively to the elusive nature of the Digital Humanities; at each refresh of the browser, the site generates a new definition\(^2\). In many ways, as I will show below, the ambiguity of the Digital Humanities is a problem of perception: instead of a field of study, or even a specific skill set, it is an approach and theory to the study of manuscripts and artifacts. It quickly became apparent in my research that it is difficult to separate trends in Digital Humanities by region or nation, and that if its definition has one constant, it’s that the Digital Humanities are almost always collaborative – and often international – in scope,
bringing together the talents of several or many individuals. For this reason it is important for the potential digital medievalist to understand that developing competency in the Digital Humanities is not a decisive reimagining of one’s career, but rather a willingness to seek out collaborative networks.

One might assume too that in North American digital medieval studies, the larger research institutions (University of Victoria; University of Virginia) are solely responsible for the impetus in development and research. This survey has revealed that smaller liberal arts colleges (Hamilton College, Bucknell University, Vassar College) have also demonstrated intense engagement in digital scholarship. I suspect that the willingness of liberal arts colleges to embrace digital scholarship may be linked to the status of digital projects vis-à-vis traditional print publication. In larger institutions, the tendency is to favor the traditional monograph and/or journal article over born-digital publications, and a scholar constructs her academic persona through print and paper. On this point, Elena Pierazzo (University of Grenoble) points out an obvious paradox:

> Scholars in the Humanities do not willingly admit to using the Internet in their research, and yet its use is pervasive and ubiquitous. The problem is that resources and editions on the Internet look less scholarly, less serious and less academic than printed ones.  

Fortunately for digital humanists, a number of organizations and institutions, including the Modern Language Association, have taken steps to recognize these new publishing frontiers and to offer evaluation guidelines for non-specialized colleagues assessing rigor in digital publication. The University of Nebraska-Lincoln is another institution to publish criteria for understanding and evaluating the quality of digital scholarship in tenure and promotion files. Despite the reluctance of some universities to “count” digital scholarship when considering tenure files, the results of this review article are clear on one point: digital scholarship is quickly establishing itself as a permanent facet of the North American academy. Libraries internationally have adopted digital systems to manage, archive, and share our textual heritage, and literary scholars are increasingly asked to participate and contribute to these digital networks. Within these parameters, all institutions of higher education will need to take into account developments in digital scholarship and pedagogy.

### 2. The Medievalist and the Computer

For most North American medievalists, the annual International Congress for Medieval Studies in Kalamazoo, Michigan conjures fond memories of new collaborations and stimulating intellectual exchanges. Over its 50-year history, the Congress has become the yearly pilgrimage site for medievalists from across the United States and Canada, while also attracting European and Asian scholars. On May 18, 1971, at 9:30 am, at the Sixth Conference on Medieval Studies, Jeremy duQuesnay Adams (Southern Methodist University) presented the first paper in the Congress’s history on computational medieval studies, “St. Augustine and Chromatius of Aquileia Meet the Computer: A Bad Trip or a Rendezvous Long Overdue?”. That same year saw seven other computer-related presentations, all organized in the general session The Medievalist and the Computer. Although computer-assisted literary studies were around since the Second World War, the 1971 Conference shows that medievalists have consistently been, in John Unsworth’s words, early adopters of technology. For the early history of scholarly computing in...
Medieval Studies, the archived programs of the 50 years of congresses, meeting between 1962 and 2015, are a useful barometer for understanding North American medievalists’ engagement with computer technology. Dorothy Carr Porter (University of Pennsylvania) has already published a brief history of the digital edition using the Congress programs. This history and Porter's observations merit reiteration in the context of our North American survey.

In her history of scholarly computing at Kalamazoo, Porter traces two main periods of computer-assisted productivity: the first, from 1971 to the early 1990s, focused on printing editorial and scholarly work on paper; the second, from the early 1990s to now, is concerned with transmitting this work digitally, bypassing the need for paper. After the initial burst of computer-aided approaches to medieval studies at the 1971 Conference, contributions on the topic continued through the 1970s. It was also during the 1970s that computational humanists founded the Association of Literary and Linguistic Computing (ALLC) and the Association for Computers and the Humanities (ACH). Porter points to the Ninth Conference of 1974 as a milestone in digital edition history; this year, in a session entitled Computer Projects, I, the paper “Manuscripta et machinae: Computers and Textual Editing” was the first to discuss computer-assisted scholarly editing. In 1979, when the conference was renamed the International Congress on Medieval Studies, six entire sessions were devoted to computer technology in medieval studies.

By the 1980s, medievalists interested in publishing their work at home for a fraction of the cost would have attended numerous presentations, workshops, and demonstrations on desktop publishing software like PageMaker. These sessions were frequent through the 1980s: at the 1987 Congress, session 308 was devoted to desktop publishing, Computer Applications III: Desk Top Publishing. At the 1988 Congress, there were two such panels in addition to discussions on laser printers for medieval character sets, suggesting that medievalists were eager to adapt technology to their own fields of study.

Congress medievalists found other software from the 1980s to be useful research tools, especially NotaBene and dBase. In 1982, Steven Siebert at Yale University launched the word processing program NotaBene with academic writing in mind. Siebert himself attended the 1987 congress and presented a paper on his work, “Camera-ready MSS Using NotaBene.” Now computers allowed medievalists to print and distribute their work in near-professional formats. Medievalists dealing with large amounts of data turned to dBase, a database management software developed in the late 1960s and early 1970s at the Jet Propulsion Laboratory. Congress presentations soon followed, including “Data Bases for Historians on Personal Computers: dBase II”, presented by Anne Gilmour-Bryson (York University) at the 1984 Congress. Interest in dBase persisted throughout the 1980s; at the 1990 Congress, William R. Bowen (University of Toronto) presented “Computer and Bibliographic Research: Power and Flexibility with dBase and NotaBene” on the panel From the Pen to the Computer.

If the 1980s sought to transmit information through desktop publishing software, the 1990s transitioned to information preservation and sharing through electronic means. The Text-Encoding Initiative (TEI) is mentioned for the first time in the 1990 Congress program. This technology provided a mechanism for preparing texts for electronic diffusion and was a first indication of the shift toward the electronic treatment of information. Soon following the keyword ‘TEI’ in Congress programs are the terms ‘hypermedia’ (1991), ‘hypertext’ (1992), CD ROM (1993), and finally ‘internet’ (mentioned...
twice in 1994). Session 241 of the 1992 Congress was entitled Computers at Kalamazoo I: Hypertext and Electronic Editions, and here scholars began discussing the impact of computer information storage on the critical edition. On this panel Hoyt N. Duggan (University of Virginia) presented “A New Critical-Diplomatic Edition of Piers Plowman B in Hypertext” one of the first electronic editions of a medieval text, alongside The Electronic Beowulf, prepared by Kevin Kiernan (University of Kentucky). Duggan’s project would mature into one of today’s model North American digital projects, the Piers Plowman Electronic Archive. The programs for the early 1990s saw the first presentations of other successful digital projects still active online, including “The Index of Medieval Medical Images” (Sponsor for the session The Use of Computer Databases to Access Medieval Pictures and Diagrams, 1990 Congress) and “Cantus: A Data Base for Gregorian Chant” presented on the panel New Research on Medieval Chant in 1990 by Ruth Steiner (Catholic University of America).

As Porter notes, the 1996 Congress is another milestone for the history of the digital edition. In this year presentations on electronic editions abound, and this new focus on electronic storage and transfer “is almost certainly a direct reaction to the advent of the Internet.” In 1996, the word ‘digital’ begins to appear in Congress programs, occurring twice in session titles. The year 1996 was also significant because it was then that the Medieval Institute launched its current website. By this point, Congress organizers acknowledged that the internet was a quickly growing force within the North American academy. The 1996 program announces an e-’Gress, or Electronic Congress:

> In response to the growing interest in electronic resources for medievalists, the 96 Congress will include demonstrations and workshops, by and for academics, to inform and instruct participants in some of the new tools for research, teaching, and telecommunicating in the profession.

As Congress organizers expected, the sessions and presentations devoted to electronic editions and workshops on web development (e.g. 1997 session 378, WWW: Instructional Uses of Java) intensified throughout the 1990s. Duggan’s work, along with the newly established Society for Early English and Norse Electronic Texts (SEENET), has been a driving force in this trend, sponsoring and organizing a regular series of panels (1994, 1997, 1999, 2000, 2007, 2014, and 2015). Finally, in the second half of the 1990s, medievalists began to consider the theoretical implications of computer technology; the journal Exemplaria sponsored session 412 of the 1997 Congress, Hypertext, Ideology, Theory: Can Medieval Studies Really Be Postmodern?

Since the late 1990s, medievalists have embraced the internet as a platform for rigorous scholarly work. In this environment, for example, emerged the Princeton Charrette Project. A notable shift happens in 2002, when the keyword ‘computer’ does not occur at all, yet the word ‘digital’ appears 10 times. Also by 2002, participants began to examine the implications of electronic platforms on academic publishing, as in the panel How to Get Published-Electronically: Advice from Editors and Insiders. A contribution by Deborah Mauskopf Deliyannis (Indiana University; editor, The Medieval Review), entitled “The Electronic Journal: The Mirror of Print?” raises a vexing question, the role of print in the digital age, a problem still at the heart of digital medieval studies. By 2006, the digital age is well underway: the keyword ‘computer’ only occurs once in the context of a scholarly presentation, while ‘digital’ occurs 24 times.
3. The Digital Medievalist

The last fifteen years of Congress programs indicate that the scholarly digital edition has firmly taken root within North American medieval studies. The rise of Digital Humanities has brought a flurry of renewed theoretical activity concerning the nature of textuality and artifact, giving new relevance to insights from scholarship of the latter part of the last century, especially the work that questions medieval textual stability. Paul Zumthor’s *mouvance* and Bernard Cerquiglini’s *variance*, ideas that ask us to read parchment differently than the printed page, remain theoretical in a strictly print paradigm. Within the digital textual environment, it is functionally possible to implement these concepts. Over the past fifteen years, digital medievalists have contextualized to an ever greater extent the scholarly edition within a network of secondary components, including transcriptions of variants, high-resolution images of all witnesses, relevant historical documents, and illuminations. This possibility destabilizes the linearity of the printed text and invites – or even forces – the user to create an individualized interpretation based on a web of possible readings. For Patrick Sahle (University of Cologne), digital editions – if truly digital – must be “guided by a different paradigm” one that definitively departs from the print system. If a digital edition indeed follows this rule of thumb, it “cannot be printed without loss of information and/or functionality”18. Ray Siemens (University of Victoria) elaborates a taxonomy of digital editions: the dynamic text, the hypertextual edition, the dynamic edition, and the social edition19. Within the context of medieval studies, it is clear that a well-conceived digital edition does not simply represent the edition as it appears on the printed page – the “token electronic edition” as Peter Robinson (De Montfort University) calls it. The digital scholarly edition must provide greater functionality to the reader wanting to navigate between the edition and non-textual features in order to formulate an individual reading of the elements at play.20 This functionality, as hypertext theory would have it, inscribes the digital text into a system of “nodes, links, and networks”21.

For a medievalist, the theoretical premise outlined above invokes the lessons of Stephen Nichol’s *New Philology*, the famously controversial 1990 special edition of *Speculum*.22 Nichol’s call for a return to the material artifact was motivated by a willingness to explain how medieval textuality resists the modern philologist’s editorial attempts to cement it into an authoritative print edition. It was also around this time that Jerome McGann reminded us that textual meaning is grounded in its material environment: “all texts, like all other things human, are embodied phenomena and the body of the text is not exclusively linguistic”23. As such, the “bibliographic code”– images, type set, margins, layout, cost, binding – are to factor into the task of interpretation. The recent volume *Rethinking the New Medievalism* asks whether the New Philology’s call for a return to non-textual features of the manuscript matrix is still current after twenty-five years24. Advances in digital imaging have indeed sustained the need for a return to material analysis of manuscripts and to recognize complex textual traditions. In fact, I would argue that North American graduate student curriculums are seldom equipped to train future digital medievalists, since many of these programs lack courses in the fundamentals of codicology and palaeography. All of the digital projects profiled below circumvent the print paradigm and present text and manuscript artifact as elements within a dynamic system. The user/reader is compelled to experience textuality in a new
way, forging new readings and interpretations through non-linear associations between the text and its material context (manuscript illumination, ink, parchment imperfections, bindings, etc).

What exactly does it mean to say that linear reading is destabilized in the digital environment? George P. Landow (Brown University) was the first to theorize the non-linear reading patterns of the digital environment in his seminal work *Hypertext*. Using a poststructuralist approach, Landow shows that digital reading does not follow narrative order or structure, and thus “may fulfill certain claims of poststructuralist criticism”.

Within this system, the reader must renounce “conceptual systems founded upon ideas of center, margin, hierarchy, and linearity and replace them with one of multilinearity, nodes, links, and networks.”

Another more recent statement on non-linear reading comes from Franco Moretti (Columbia University). Moretti’s critical approach, as outlined in *Graphs, Trees, Maps*, recognizes that in a scholar’s lifetime, it is impossible to read all literary and historical documents in a given period well enough to synthesize important conclusions. Moretti advocates for “distant reading” (the title of a more recent iteration of his methodology), which shifts the literary scholar’s focus from individual texts to larger macro structures at work in literature. As he explains, distant reading is a condition of knowledge: it allows you to focus on units that are much smaller or much larger than the text: devices, themes, tropes – or genres and systems.

Moretti does not simply advocate for distant reading to complement close reading; he argues that it should indeed unseat it. In fact, for Moretti close reading is “a theological exercise – very solemn treatment of very few texts taken very seriously.” This methodology coupled with the digital reading environment may eventually provide a valuable shortcut for medievalists who wish to understand quickly through distant reading practices the textual context surrounding their particular specialty.

Moretti’s distant reading is clearly grounds for fierce polemic, as he readily admits: “The United States is the country of close reading, so I don’t expect this idea to be particularly popular”. His approach, as expected, works against those who embrace close textual engagement. The polemic implicit within Moretti’s work invokes a long-standing reluctance on the part of some medievalists to adopt digital methods. As Jessica Pressman (San Diego State University) and Lisa Swanstrom (Florida Atlantic University) point out, however, one must not dismiss digital approaches to the humanities as merely quantitative: “The digital humanities is not just a means of acquiring and accessing data about literary genres, literary history, and the reading and writing practices enabled by them”. Volume 7.1 of the journal *Digital Humanities Quarterly* published a special issue on this topic entitled “The Literary”. These contributions explore how digital reading strategies lead to a deeper engagement with text. The critical debate on this topic is extensive, and for our purposes here, we will look at what these discussions mean for digital medievalists.

One implication of reading medieval texts in a digital environment concerns our understanding of the medieval fragment. In a printed edition, the fragment is framed within a hierarchy of manuscript completeness. Occupying the bottom of this system, the fragment is relegated to endnotes or footnotes and is often only relevant when the reading of the ‘best’ manuscript is obscure. The digital environment makes possible a hypertextual deconstruction of the manuscript stemma. As promised in Landow’s
hypertext theory, digital editions have the potential to destabilize the evaluative lexicon of critical print editions, including ‘best’, ‘corrupt’, ‘fragmentary’, ‘acephalous’, ‘authoritative’, etc. This non-linear system potentially impacts the way medievalists will interpret and interact with manuscript fragments. If presented within a digital network, easily accessible and readable, a fragment of parchment is not understood for what it is lacking, but rather for what it represents as a material artifact within a larger historical context. This is the case I make for a fragment of the Franco-Italian Huon d’Auvergne romance-epic in a forthcoming article in Digital Philology. Disrupting the manuscript stemma can also have larger implications for national literary canons. With more manuscripts and variants available, readers no longer have to rely entirely on literary histories to direct their readings and will be able to appreciate the mouvance implicit within a given manuscript tradition.

Arguments against digital reading environments may hold certain validity for print-based genres, such as nineteenth-century novels. For medievalists, however, reading manuscripts – a non-print medium – is an activity that leads to debates concerning the inadequacy of print-oriented reading practices. These discussions are at the basis of Zumthor’s mouvance and of New Philology’s call for a return to the manuscript. Additionally for medievalists, these polemics have a familiar ring and call to mind the interaction between manuscript and print media after the introduction of printing in Europe. As scholars who are accustomed to working across mediums – print and parchment – it makes sense that medievalists are eager to take advantage of the digital platform. Going forward, it is important to keep in mind that digital reading is not less meaningful or insightful than print reading. Whether it be parchment, print, or screen, we might imagine a diversity of reading textures. Sometimes the activity of collecting information runs smoothly, sometimes it jumps from point to point, sometimes it is entirely erratic. Each medium facilitates a different and potentially illuminating reading experience.

The questions of reading practices and media theory raise an inevitable question that has occupied discussion in the last fifteen years: What is the legacy of print in the digital age? Does the digital scholarly edition render the print edition obsolete? In 2005, Robinson suggested that the digital edition is superior to the print edition, and that

Of the many kinds of print objects produced over the last centuries, it is difficult to think of any genre that is so well adapted to the computer as the scholarly edition.”

He concedes however that

many scholars are not persuaded of the advantages of digital editions – or at least that they are still sufficiently satisfied with print editions as to be happy to continue to make and use them.”

Indeed, as a survey conducted by Porter shows, the superiority of the digital edition is not an opinion shared by all medievalists. Conducted twice, in 2002 and again in 2011, the survey shows that

medievalists are using print editions more than they are using digital editions, and the use of digital editions has not grown over the past nine years, as it has, for example, for digital journals.”

Perhaps recognizing these preferences, Hans Walter Gabler acknowledges a place for both digital and print:
the digital medium will be the native medium of the scholarly edition of the future. It will be the medium to study and use editions; while the print medium will remain the medium to read texts.\textsuperscript{40}

A lively debate on this topic plays out in Stephen Nichols’s article “Materialities of the Manuscript” where he engages with Deborah McGrady’s criticism of digital access to medieval manuscripts. McGrady (University of Virginia) writes that the digitized manuscript openly mocks the material, peddles in nostalgia, and cultivates a desire it cannot satisfy. [...] It also exposes and even flaunts its status as a ‘remediated’ product defined by its distance from the desired original.”\textsuperscript{41}

After contextualizing McGrady’s argument within a long tradition rejecting mimesis (particularly Plato in Cratylus), Nichols counters with the observation that medieval manuscripts “are neither copies, nor forgeries, nor clones threatening to usurp the rightful place of the manuscript they preserve in images” and that “precisely because they attest the existence of the manuscript so perfectly, they acknowledge their secondary status as record”.\textsuperscript{42} Arguments of this kind, Nichols concludes, ignore the most important benefit of digitized manuscripts: they extend access beyond “only a privileged few.”\textsuperscript{43}

Whether a specific edition project opts for strictly digital, strictly print, or a combination of the two depends on the nature of the project. It would make sense for an image-based project to be published entirely digitally, as is the case with Martin K. Foys’s digital edition of the Bayeux Tapestry.\textsuperscript{44} With computer imaging technology at a point where material codicological and paleographical features images can be displayed digitally with astounding detail and accessed freely and easily, the manuscript now has new relevance to a wider population of scholars and students as a textual medium. I would argue that instead of a progressivist understanding of material support – one medium supersedes and renders obsolete the previous (wax to parchment to paper to screen) – it would be useful to acknowledge the specificities of each material with respect to the text it transmits, and to use all mediums for what they are able to offer differently. This perspective implies that the digital medium cannot present what the parchment medium can, and handling manuscripts in person will indeed also still be a productive operation.

Additionally, with material-specific reading modes in mind, it is clear that there is still a certain advantage in having the printed edition for reading long passages of narrative, while having the digital edition to quickly navigate a web of secondary texts and artifacts. The Iconic Page in Manuscript, Print, and Digital Culture, a collection of essays from a 1996 University of Michigan conference, calls for the “integration of the iconic or semantic features of the physical text with more traditional and purely linguistic considerations” a strategy inspired by McGann’s “bibliographic code”.\textsuperscript{45} With new technology like tablets, the theoretical premises of each medium will be further nuanced. It is certain that digital editions do not need to replace print and that they potentially enrich the print-based reading experience, making it more dynamic and vivid.

Theoretical obstacles aside, the digital medievalist has a healthy dose of pragmatic concerns to overcome before getting a project off the ground. First of all, any digital humanities project is potentially prohibitively expensive. For this reason, most large-scale and successful projects are necessarily funded by a grant agency, such as the United States’ National Endowment for the Humanities or Canada’s Social Sciences and Humanities Research Council.\textsuperscript{46} Many North American institutions have set up centers for
digital humanities to provide faculty with at least the minimum support to conduct
digital scholarship. The Andrew W. Mellon Foundation is a potent funding source for
liberal arts institutions and is one of the reasons small colleges maintain a competitive
edge in digital humanities development.

Secondly, individual scholars are seldom equipped to tackle digital projects
singlehandedly. Most projects represent hours of detailed collaborative efforts between
one or several medievalists and a team of technologists\(^4\). For reasons of cost and labor,
the humanities research paradigm as it exists in the North American academy seldom
accommodates digital medieval studies. In addition to placing prestige in individual
scholarly endeavors, such as the monograph, institutions will need to recognize the
necessity for digital medievalists to work in teams and adopt a scientific model for
research. Because of formidable logistical obstacles, digital humanities projects differ in
important ways from traditional medieval studies. All of the North American projects
detailed below have adopted team-based models to meet their objectives.

On top of these hurdles, two concerns cited by Robinson in 2005 are still in play: finding
willing publishers and enabling medievalists to quickly and efficiently learn the basics of
XML. And a final concern: scholars accustomed to print-based scholarship will need to
reconsider what it means to finish a project. In the digital environment, work can be
elaborated upon and altered infinitely\(^4\). This for instance has implications for peer-
review: At what point is a work deemed scholarly? Does the review process need to be
repeated? This of course leads to the question of maintenance: Once a project is deemed
finished, who makes sure it is continually operable?

In the remainder of this essay, I will profile four successful digital projects: the Princeton
Charrette Project, the Roman de la Rose Project, the Piers Plowman Project, and the
Cantus Database. Additionally, I will survey the tools and technologies available to the
digital medievalist, all of which signal a return to material philology. Through these
examples the collaborative research model is a clear objective for future digital medieval
endeavors.

4. Project Profiles

4.1. The Princeton Charrette Project (PCP)

Through digital color jpeg files, the PCP provides access to the eight extant thirteenth-
century manuscripts that conserve Chrétien de Troyes’s twelfth-century Le Chevalier de la
Charrette. With only a few minor modifications, the site uses as its textual base Alfred
Foulet and Karl D. Uitti’s edition of the romance as prepared for Classiques Garnier\(^4\). Uitti’s
team digitized all eight texts using the Standard Generalized Markup Language (SGML),
which descends from IBM’s Generalized Markup Language, developed in the 1960s. For
the PCP, the documents were revised using XML in order to assure the longevity of the
files\(^5\). In addition to the Foulet-Uitti edition and diplomatic transcriptions of all
manuscript witnesses, the site provides tools for analyzing the poetic, rhetorical,
grammatical, and syntactic characteristics of the text.

The PCP is among the most successful models of electronic text editing to emerge from
the 1990s/early 2000s. As the site introduction explains, the project unfolded first under
and 2006, the site was maintained by Rafael Alvarado (Dickenson College), and the two co-directors Gina Greco (Portland State University) and Sarah-Jane Murray (Baylor University). The site currently accessible to the public is a “snapshot” of the project’s original work and collaborations. In 2006, Alvarado published the “Report on Creating a Snapshot of the Princeton Charrette Project” a detailed record of the project’s methods and scholarly development. This is a useful guide for any developing digital edition project.

Gina Greco, in an article from 1996/1997, states that the aim of the resource is to provide an environment where any student or scholar connected to the Internet can come close to doing the type of work we describe: consult and manipulate the variety of materials relevant to the manuscript tradition.

Central to the project’s mission is to give any student or researcher access to the variability of medieval textuality and, in this sense, the PCP puts into practice the theoretical underpinnings of the New Philology. The PCP recognized its innovative stature already in 1997, when Greco wrote that the site should interest not only medievalists, but also computing humanists “as a model of how to apply the computer’s capacity to manipulate a variety of source materials.”

Undoubtedly one facet that has guaranteed the rigor and success of the project is its sophisticated and methodically-planned technical back-end. Through a series of independently published articles, the authors have created a detailed record of this process. Greco 1997/1998 details the use of the SPIRES database and its ability to generate files tagged according to the TEI standards. In 2002, Greco clarifies how the TEI guidelines are used to represent the physical aspect of the manuscripts and to indicate non-standard characters and abbreviations that do not figure into the standard Unicode system. In “Analyse linguistique par traitement informatique” a section of Cinzia Pignatelli’s 2003 article “L’archive du ‘projet Charrette’: huit manuscrits prêts à se livrer” we see the linguistic applications of the Charrette technology. As Pignatelli explains, a macroinstruction was developed that “permet d’obtenir des listes de concordances par mots ou par séquences graphiques.”

In her article “Informatique et textualité médiévale”, Sarah-Jane K. Murray (Baylor University) provides a detailed analysis on how separate teams used XML and a database system to tag linguistic, poetic, and rhetorical elements of the Charrette.

The authors explain that the advantage of the PCP’s archived resources is to provide researchers and students access to numerous components of a textual tradition in order to arrive at conclusions that would be impossible solely through print. This aspect of the project indicates a theoretical foundation that considers the implications of text shifting from parchment to digital. The site is able to evoke the mouvance of medieval textuality by providing researchers and students access to a multiplicity of versions. This theoretical principle was a driving idea from the early years of the project; Greco writes that

Le Projet Charrette présente, ainsi, que Roland Barthes a appelé un ‘texte’ par opposition à une ‘œuvre.’ Notre projet non seulement prend en compte les types de questions soulevées par Barthes, mais plus spécifiquement s’intéresse à la recherche médiévale contemporaine qui nous a fourni des concepts tels que l’intertextualité (Zumthor), la manuscriture (Poirion), la mouvance (Zumthor, Pickens), la nuance (Rychner) et la variance (Cerquiglini).

The project has also clearly justified the continued relevance of the printed page. Since the Foulet-Uitti edition exists both in print and on screen, the reader has two modes of
access. In this respect, the digital edition has the advantage of being a tool to augment the printed artifact. For reading extended passages of the text, the printed edition remains the easiest solution, and for understanding the manuscript context, the reader can then move to the site to understand how certain passages interact with the manuscript *mise-en-page* or with the illumination program.

For many reasons the PCP is a model for what makes for a successful electronic edition. Relevance and functionality have been maintained for the three narrative supports – digital, print, parchment – and the methodically-planned technical mechanism provides a solid point of departure for future electronic editions. This characteristic evokes one of the stated goals of the project, “to create a foundation for future and parallel projects.”

A question that faces the PCP, as well as any online electronic scholarly contribution, is its longevity. The project contributors created the archive with this in mind. The choice to use the TEI guidelines will ensure that the files are stable and readable for the indefinite future, and the “snapshot” version of the site has ensured functionality up until the date of this article (2015).

### 4.2. Roman de la Rose Digital Library (RRDL)

In its current form, the RRDL offers high-resolution scans of over 130 manuscripts of the *Roman de la Rose*. The project is mainly funded by the Andrew W. Mellon Foundation and, since 2007, is a collaborative initiative between the Sheridan Libraries of Johns Hopkins University (JHU) and the Bibliothèque nationale de France (BnF). The BnF joined the project with the aim of digitizing all Rose manuscripts in all French municipal and university libraries. Securing rights to high-resolution images can be expensive and difficult for a digital edition project, but the RRDL has navigated this issue effectively. The “Terms and conditions” tab in the menu informs users that the “individual manuscripts and images of them are retained by the owning library” while the JHU holds the copyright to the site itself. The collection of digitized manuscripts is still growing, and additions and updates are announced on the site’s blog. The RRDL represents nearly 20 years of development, and was conceived by Stephen Nichols (James M. Beall Professor Emeritus of French and Humanities, JHU) who began the project in 1996 with the goal of bringing students into contact with medieval manuscripts. The RRDL is a model for the collaborative research model: the current project directors, Stephen Nichols and G. Sayeed Choudhury (Associate Dean for Research Data Management, JHU) are assisted by a diverse international team of experts. The project includes a scholarly advisory committee, which affirms the site’s reputation as a trusted and verified resource for research and teaching. Finally, the project incorporates the work of student transcribers, thus functioning as an authentic academic apprenticeship for students of medieval studies.

The site features a range of entry points to access the data archive. The “Collection spreadsheet” in the left menu gives researchers an initial glimpse into the range of the manuscript collection and provides an opportunity to access the site’s raw data. Researchers can select a manuscript witness according to repository, common name, current location, date, origin, type, illustration type, folio count, or by transcription. These ready-made search parameters make it possible to link witnesses in innovative ways and allow the user to forge a path through the material without following a predetermined structure. The folio count search, for example, could lead to conclusions...
about how the textual tradition spread, in what state, and what details of the tradition would have interested the manuscripts’ contemporary readers. For many of the manuscripts, there are detailed codicological analyses, and these are done by experts in the field of manuscripts studies, such as Timothy L. Stinson (North Carolina State University). When specific folios are mentioned in the codicological analyses, there is a link taking the user directly to the scanned image.

43 Selecting any manuscript under the available options (“repository” to “transcription”) will give the option to leaf through the witness. There are three viewing modes: small, larger and popup. The Flash popup window allows for quick navigation of an entire manuscript through thumbnails, or facilitates detailed viewing of a manuscript page. A bookmark function is also available in the viewer. For researchers or students working in material philology, the high-resolution images capture individual pen and brush strokes, creases and wrinkles in the parchment, and even hair follicles. The benefit of this tool is clear; it will undoubtedly facilitate new research into the Roman de la Rose manuscript tradition that would have been extremely costly and time consuming otherwise. Unfortunately, the transcription of the many manuscripts has only just begun. This feature will be enormously valuable to the scholarly community when the project’s transcriptions are more complete.

44 One of the innovations of the RRDL is its attempt to take advantage of the social dimensions of the digital environment; beyond the repository of over 130 manuscripts, the project connects to the public through a blog and Twitter. Created and maintained by Tamsyn Rose-Steel (CLIR/Mellon postdoctoral fellow at JHU) and Mike Rose-Steel (PhD candidate, Exeter University), the Twitter handle @RoseDigLib regularly features lines in modern English of Guillaume de Lorris’s original poem; a tweet from July 22, 2015 reads: “and plucked for me, from just beneath the bloom a saw-toothed, fresh, green leaf”. As of August 9, 2015, the account had sent out 610 tweets and had 1,521 followers, suggesting a real engagement with the online medievalist community. The @RoseDigLib account is also a platform for regular image updates; the July 22 tweet shares with followers an image from BnF Français 12595. Through experimentation with social media, the project takes on more recent developments in cyberspace by broadcasting the contents to a wider public and reminding followers that the site is still active. The social media features can potentially create a new model for scholarly engagement in which users will regularly be invited to return to the site and interact with its contents. In this way, the site will exist in present time, not simply remain a static frozen resource, as is the case with the PCP “snapshot”. The challenges to maintaining the social media momentum are significant, and other editors of digital editions will learn how to sustain interest through the example of the RRDL blog and twitter experiments. By 2014 the user statistics indicate that the RRDL has gained a respected place in Roman de la Rose scholarship: the site had accumulated 71,456 unique visitors, 4,334 of which had visited the site more than 200 times, and 6,125 of which had visits lasting over 30 minutes.

4.3. Piers Plowman Electronic Archive (PPEA)

45 The PPEA is one of the longest running digital edition projects, beginning in 1993 when Hoyt D. Duggan became a fellow at the University of Virginia’s Institute for Advanced Technology in the Humanities (IATH). Since the archive’s early days, the project has only gained momentum with an impressive number of participants and editors. A significant
factor in the project’s sustained momentum is its willingness to welcome fellow researchers in the transcription of yet-unpublished manuscripts. The long-term aim of the project is to publish all medieval and Renaissance witnesses of the *Piers Plowman*, a fourteenth-century allegorical dream vision, attributed to William Langland. The poem survives in more than 50 manuscripts and in three versions (A, B, and C)\(^\text{41}\). The archive features color digital images of the witnesses, allowing researchers to understand and interpret each iteration of the poem in its material context and in relation to other examples of the surviving tradition.

Currently, under the tab “Texts”, the archive features only witnesses of the B version. These editions are of two types: one critical edition prepared by John Burrow (The University of Bristol) and Thorlac Turville-Petre (The University of Nottingham), which reconstructs a lost archetype; and nine documentary editions, which are transcriptions from unique manuscripts. Manuscripts of the A and C versions are among the eight manuscripts listed in the “Work in Progress” section of the site. Each edition listed under “Texts” features a main page listing the editor and the technical team, and a table of contents. In the menu on the left of each edition, there is a useful “How to Use” page for first-time users. In addition, each edition has an introduction describing the construction of the edition and the physical state of the witness. The editorial method is clearly described, including the process involved in obtaining and presenting the color facsimiles. As for the edition interface, there are three style sheet modes: scribal, diplomatic, and critical. The foliation is linked to high-resolution images, which appear in pop-up windows and therefore allow users to compare the edition to the facsimile.

Buttons at the top of the page allow for easy navigation between narrative or codicological units. All XML work is also available for examination, and the TEI tags provide a detailed account of the physical makeup of each manuscript through codicological notes. For editors of medieval scholarly editions, the PPEA TEI work serves as a model for developing one’s own set of encoding principles and, together with the online TEI tutorials, can be a useful shortcut to modeling the encoding guidelines to other medieval texts. The encoded file for each edition also illustrates the ability for TEI documents to stand as a detailed conservation record for historical artifacts.

Finally, taking full advantage of the digital reading environment, the site offers a search function that allows users to find key words and passages throughout the editions. The overall site layout is well planned and easy to use, making the archive an appropriate resource for a variety of users. In fact, the site’s mission statement (under the tab “About”) identifies three target audiences: teachers in high schools, teachers of undergraduates, and advanced students and scholars. The “Resources” tab offers didactic material for teaching both high-school and university content.

The mission statement also grounds the project on a firm theoretical foundation, linking medieval textuality with hypertext, and thus bypassing print. The site’s intricate yet well planned system of links makes the project an example of how the medieval scholarly edition can rethink the print paradigm and offer an experience that leads users to appreciate the experience of manuscript reading. The statement remarks that

Medieval readers, very much like contemporary surfers of the web, used and produced compilations, copying, arranging, editing, and commenting on the texts they inherited from many sources\(^\text{42}\).

The organization of the site and the variety of access modes for the user make the PPEA a model for other large-scale digital medieval projects.
4.4. The Cantus Database

The Canadian Cantus database is based at the University of Waterloo and works in collaboration with the university’s MARGOT research project, which has published a cluster of digital editions of medieval or early modern French texts. Cantus is a collaborative and open-access project archiving and indexing Latin ecclesiastical chants. The source material for the database comprises an ambitious date range, from manuscripts as early as c. 890 (Albi, Bibliothèque municipale, Rocheuge 44) to printed books of the sixteenth century. Like the three projects profiled above, the Cantus database is a long-established digital resource for medieval musicologists, developed in the late 1980s by Ruth Steiner (Catholic University of America), who collected the first entries on a university mainframe computer. Since Steiner’s first presentation on the project, “Cantus: A Data Base for Gregorian Chant” at the 1990 International Congress on Medieval Studies, the database has grown to an incredibly rich and powerful resource. Debra Lacoste (University of Waterloo), the project manager and principal investigator, notes that by 2012 the database had over 379,000 records of individual chants from 138 separate manuscripts. The site’s statistics record an average of 142 unique site visits per day, which speak to the database’s authority and value to musicologists.

For first-time users, the sites “About” tab gives instructions on how to access the database. Users can browse the database by a list of indexed sources, a list of Feast names (with calendar date), and a list of all chants in the database. There is also a search function allowing for single or multiple words. The site features a Cantus analysis tool that “allows the user to select any liturgical feast in one manuscript and compare the choice and order of chants to any other manuscript indexed by Cantus.” The “analytical tools” section indicates that there will be further development of the analytical function. For users interested in contributing to the database, the site has a built in Cantus Input Tool that allows for submission via an online form. The form allows the site to compile a series of metadata for each entry, including incipit, full text, folio, office, genre, position, and liturgical occasion.

The “Sources” tab leads users to a chart of all indexed manuscripts (by siglum and manuscript identifier), date, provenance, and number of chants. Some manuscripts contain links to digitized images hosted on outside library sites. Each manuscript link directs the user to a full description of the manuscript source and a set of navigation tools on the left, leading to images, source analysis, and folio number. The “Feasts” and “Chants” tabs offer further functionality for researchers looking into one particular feast or chant tradition. The analytical tool is the most compelling feature of this site; it can quickly supply information leading a researcher toward conclusions concerning a chant’s transmission and reception.

The Cantus Database is an example of how the digital environment can be successfully applied to non-literary medieval sources. The conclusions and comparisons enabled by this database would certainly have been difficult, if not impossible, without the digital platform. Like the RRDL and the PPEA, the Cantus database also demonstrates that the collaborative element of a digital project is key to its longevity and continued viability as a rigorous online resource.
5. Tools for the Digital Medievalist

I will now turn to a survey of a few of the most widely used tools that facilitate a digital return to the manuscript source. All of the following tools have been developed by North American institutions, and I include only a small sampling of those available. Most tools reviewed here are open source – their is code freely accessible to all users, who can alter, improve, and customize it. For researchers seeking a specific digital tool, there are two online directories searchable by function: the University of Alberta’s Text Analysis Portal for Researchers (TAPoR); and the Mellon funded Digital Research Tools Directory (DiRT). Additionally, there are annual conferences offering training in the Digital Humanities. The University of Victoria’s Electronic Textual Cultures Lab beyond its role as a center for digital development, hosts the annual Digital Humanities Summer Institute. The Humanities and Technology Camp (THATCamp) is another opportunity for medievalists interested in the digital humanities. THATCamp brings together humanists and technologists to share ideas and expertise, no matter what the skill level. The conference is free, and has grown to include international locations.

5.1. Tools for Text

5.1.1. Publishing Scholarship

There are several international and North American-based journals, both established and emerging, providing forums for contextualizing digital medievalists’ work within broader trends and discussions. Contributions by North Americans medievalists in the United States and Canada show that these scholars work in a broad spectrum of inquiry, from the theoretical to the technical.

The journal Digital Scholarship in the Humanities (formerly the Literary and Linguistic Computing) is the oldest publication, established in 1986. It is the official journal of the international Alliance of Digital Humanities Organizations, whose aim is to promote digital scholarship and education in all fields of the humanities. This journal has been a regular international resource for medievalists working with digital technologies. Another prominent international publication, the Journal of the TEI, is now in its eighth issue and is the official journal of the Text Encoding Initiative Consortium. Established in 2011, this online publication examines a range of technical and theoretical topics that can potentially serve as models for digital medieval projects. Another dynamic forum at the general and international level is the Digital Humanities Quarterly (DHQ), published by the Association for Computers and the Humanities, founded in 1978.

There are two noteworthy Canadian journals. The first is Digital Studies/Le champ numérique, published by the Canadian Society for Digital Humanities/Société Canadienne des Humanités Numériques (CSDH/SCHN). This is another avenue for digital medievalists who want to situate their own work within broader international and cross-disciplinary trends. The second, based at McMaster University and in its fourteenth year, is Text Technology, which also publishes on a broad range of topics in digital computing.

For medieval topics specifically, there are newer, emerging journals such as The Digital Medievalist and Digital Philology. The Digital Medievalist has published essays since 2005 and is a resource for medievalists to discuss and exchange ideas and technical expertise.
more recent publication, the journal *Digital Philology*, provides perhaps the most innovative forum specifically for digital medievalists. Stephen Nichols and Nadia Altschul (JHU) write that the journal’s title recognizes the mass of online data now available to medievalists researching all aspects of medieval culture. For this reason, the journal is not only devoted to digital projects, but sees ‘digital’ as a new way of accessing the critical object and going about pre-modern studies. For the journal, digital is as much a methodology as it is a tool.

Finally, a word on alternative publication modes, specifically blogs. Even if blogs are generally dismissed as informal and nonacademic, several are quite rigorous and are maintained by academic medievalists as, for example, the blog section of the RRDL. Blogs are also a valuable mechanism to gauge what impact medieval studies has on a more general audience, and they show how our critical objects spill into popular realms. For scholars interested in the study of modern medievalism, blog forums are useful sources for understanding modern culture’s continuing engagement with medieval cultural and narrative legacies.

*Modern Medieval*, maintained by Rick Godden (Tulane University), Matthew Gabriele (Virginia Tech), et al., is a continuing discussion on the role of the Middle Ages in contemporary society. *Modern Medieval* frequently organizes sessions at the International Congress for Medieval Studies, including Godden’s 2014 roundtable *Disability Studies and the Digital Humanities*.

The blog *In the Middle*, created and maintained by Jeffrey Jerome Cohen (George Washington University), follows new trends in critical theory as applied to Medieval studies. Blog posts are also a useful reference for upcoming conferences and new publications. Launched in 2006, the blog is extremely active with regular contributions and announcements.

### 5.1.2. The Text Encoding Initiative

The Text Encoding Initiative is first and foremost an international consortium that develops, maintains, and publishes standards for encoding literary documents. The guidelines originated from a 1987 conference at Vassar College, in Poughkeepsie, New York, whose organizers sought to address the lack of long-term standards for storing and sharing data. As discussed above, the 1980s were driven by software standards that, in order to ensure company profits, were not interchangeable. As the TEI official website explains, the guidelines for encoding literary texts came from a concern that the entrepreneurial forces which drive information technology forward would impede such integration by the proliferation of mutually incompatible technical standards.

The guidelines proposed by the TEI have provided a robust international standard that addresses the specificities of literary documents. The guidelines “define a ‘tag set’ of XML ‘elements’ that are used to encode texts, along with ‘attributes’ used to modify the elements.” The TEI tags can be used to describe for example the nature of primary sources and their narrative structure, to detail physical features of a manuscript, and to record names and dates. For medievalists, the TEI markup language can even be used to encode physical features of a manuscript’s binding, the idiosyncrasies of a scribal hand, or the presence and nature of illuminations. The ultimate advantage of a TEI encoded...
edition is longevity (the code is not software specific) and its currency within international academic and library circles.

A 2012 survey completed by Burghart and Rehbein found that the majority of the TEI community resides either in Europe – in particular France – or North America, making these two geographic areas the center of TEI encoding activity\(^7\). More specifically, 23% of the respondents were from the United States, 22% from France, and only 3% from Canada. Consistent Unsworth’s conclusions, medievalists are quick to embrace new technologies: the largest group of surveyed TEI users are now medievalists, at around 35%\(^7\).

As Robinson has pointed out, learning TEI is a significant hurdle for medievalists wanting to undertake a digital edition\(^7\). The Burghart survey offers encouraging insight into this problem; most scholars using TEI did not learn it formally in a course, but are either self-taught, or have learned TEI by doing it\(^7\). This survey found too that most medievalists who develop skills in TEI are interested in applying this technology in manuscript studies: 85% of projects surveyed use the TEI Guidelines for manuscript description\(^7\).

There are excellent online resources to help medievalists develop a working competency in TEI encoding, including *TEI by Example*, the University of Nebraska-Lincoln’s *Basic Guide to Text Encoding*, and the site *A Gentle Introduction to XML*, which is published by the TEI consortium\(^8\).

### 5.1.3. TAPAS

The TEI Archiving, Publishing, and Access Service (TAPAS) is an emerging platform (launched in 2014) that provides a low-cost means for TEI document publishing and archiving. The service is intended for researchers, librarians, and students who do not have institutional support and who need to store their TEI data in a stable, long term repository. The value to digital medievalists with limited institutional support is therefore obvious. The TAPAS was launched in 2014 and development is still ongoing. Its TEI advisory board consists of many of the most active North American digital scholars, including Andrew Ashton (Brown University), Julia Flanders (Northwestern University), Scott Hamlin (Wheaton College), John Unsworth (Brandeis University), and Patrick Yott (Northeastern University).

The TAPAS project emerged from the efforts of private liberal arts colleges: Wheaton College, Willamette University, Hamilton College, Vassar College, Mount Holyoke College, and the University of Puget Sound. Brown University and the University of Virginia later joined this team. The U.S. Institute of Museum and Library Services and the National Endowment for the Humanities have funded the project. Flanders and Hamlin write that TAPAS readers will have a corpus-level interface through which those new to TAPAS can explore, find projects and texts of interest, analyze the TEI encoding used, and perform other corpus-level activities\(^8\).

A similar project is the Canadian Writers Research Collaboratory (CWRC, http:www.cwrc.ca), which provides storage for digital projects on literature published by Canadian scholars, or projects on Canadian literature.

Finally, the Medieval Electronic Scholarly Alliance (MESA) is an international federation of online digital resources, digital medievalists, and institutions\(^8\). The goals of MESA are “to provide a community for those engaged in digital medieval studies and to meet
emerging needs of this community”. Another important component of MESA is its two-tiered system of peer review, making it an asset to pre-tenure researchers in the Digital Humanities.

### 5.1.4. Text Transcription

There are several systems developed to aide medievalists transcribe directly from their digital manuscript images. The oldest, developed in the 1980s at the University of Southern Mississippi, is a collation and transcription program developed for the DigitalDonne project. The software has been continually updated and is free for download.

Another useful online resource is T-Pen, or Transcription for Editorial and Paleographical Notation, developed by James Ginther (St. Louis University) for web-based manuscript transcription. Users can upload manuscript facsimiles, transcribe lines using a useful interface, and create projects in which researchers in other institutions can participate.

Another resource is FromThePage, which allows functionality similar to T-Pen. This free software offers a range of features, including version control and wiki-style editing, which creates a platform for collaborative transcription and text editing.

### 5.2. Tools for Image

#### 5.2.1. Digital Curation

For medievalists working with large image sets, there are several options for digital curation. First of all, the *International Journal of Digital Curation* is a publication devoted to issues and technology in digital curation. This journal is general in scope, but provides a starting point for medievalists designing their own curation project. For medieval studies specifically, *Digital Humanities Quarterly* has devoted volume 7.2 to the topic of curating digital spaces.

The University of Western Ontario, through a research project of the CulturePlex Lab, has designed Yutzu, an easy-to-use yet effective platform for displaying image collections. Yutzu is collaborative and works well for teaching and for research teams. For projects that require a greater level of formal curation, George Mason University has designed Omeka with museums, libraries, and archivists in mind. Omeka adheres to recognized metadata standards, specifically the Dublin Core standards, and is an open source web-publishing platform funded in part by the Andrew W. Mellon Foundation. A plugin to Omeka is Neatline which, as its site presentation explains, is a geotemporal exhibit-builder that allows you to create beautiful, complex maps, image annotation, and narrative sequences from Omeka collections of archives and artifacts.

Neatline, designed by the University of Virginia’s Scholar’s Lab, creates a professional visualization for archived data.

#### 5.2.2. Image Annotation

As a text-based XML language, TEI is not applicable to projects with aims to annotate digitized manuscript images, illuminations, art, or maps, all of which are central to many medievalists’ research. There are several promising North American projects underway...
that would allow medievalists to take full advantage of the digital reading environment, linking text, image, and commentary. Furthermore, an effort led by the Stanford University libraries and the British Library has organized the International Image Interoperability Framework (IIIF), which would provide researchers a set of standards for annotating and sharing images. The Digital Medieval Manuscript Initiatives, a part of the Stanford project, is working to develop an infrastructure for repositories of digital medieval manuscript facsimiles. The tools profiled below, DM and ImageMAT, are only two examples of annotation tools emerging from universities in the United States and Canada. There are many more, but these two serve as examples of what is available to the Medievalist designing a digital text environment.

With a Digital Humanities Implementation Grant from the National Endowment for the Humanities, the Schoenberg Institute for Manuscript Studies at the University of Pennsylvania is developing “DM: Tools for Digital Annotation and Linking”, which enables users to markup digital manuscript images. The current phase of the project stems from the earlier Digital Mappaemundi project, a partnership between Martin K. Foys (University of Wisconsin-Madison), editor of the Bayeux Tapestry, and Shannon Bradshaw (Drew University). The project moved to the Schoenberg Institute in 2014, and Dorothy Carr Porter is now the technical lead. As the website explains, there are four types of resources with which DM permits the user to work: images, texts, and fragments of images or texts as marked out by a user.

ImageMAT is another solution for image annotation. The project is based at the University of Waterloo and was awarded a Mellon grant in 2010 to develop the tool under the direction of Christine McWebb, associate professor of French at Waterloo. The project is partnered with other leading digital humanities projects, including the Digital Library for Medieval Studies (Johns Hopkins University), T-Pen (St. Louis University), and Open Annotation Collaboration. ImageMAT, as its site presentation explains, will be a web-based image annotation tool designed to facilitate and perfect online searches, information aggregation, annotation, and self-organizing knowledge of enriched multi-representational databases.

ImageMAT is collaborating with the IIIF in its effort to develop international standards for image sharing and annotation.

Finally, a note on digital imaging techniques for medievalists working with damaged manuscripts. The Lazarus Project, based at the University of Mississippi, uses multi-spectral imaging techniques to access damaged texts. Computing hardware and algorithms for image processing “allow imagery to be generated from texts that have been damaged or erased”, including damage from water and fire. A new collaboration on the horizon for the Lazarus Project involves the Early Manuscripts Electronic Library and the city of Chartres. This collaboration will digitally reconstruct texts damaged by the Allied bombing of the city, including the Heptatechon of Thierry of Chartres and other documents fused into bricks.

6. Conclusion

Scholarly digital editing is at a crossroads as advanced imaging technology allows virtual access to the material minutiae of manuscript parchment. Researchers like Christoph Flüeler (Université de Fribourg) ask whether ultra high-resolution manuscript facsimiles question the relevance of the critical edition. If the traditional edition is an attempt to
represent the material artifact in print, do the vivid images of modern digital libraries render the print edition obsolete? Could an edition simply be a high-resolution image of the object with annotation software to facilitate reader access to text? With IIIF standardization protocols for image resolution, presentation, access, and dissemination, scholars will be able to rely to a greater extent on the digital artifact as the critical object. Diplomatic editions will still ease the user’s access to the manuscript image, but it may no longer be necessary to describe a scribal omission in footnotes; one could simply show it.

Other possibilities for the critical edition are also on the horizon. Ray Siemens (University of Victoria), in his article “An approach to understanding the electronic scholarly edition in the context of new and emerging social media”, brings to our attention the possibilities of what he calls the ‘social edition.’ For Siemens, this emerging possibility for textual emendation would “extend our understanding of the scholarly edition in light of new models of edition production that embrace social networking and its commensurate tools.” Will the Digital Humanities allow medievalists to collectively interpret and edit a manuscript witness? Will frameworks based on social media allow archivists of medieval art to collaboratively curate inter-institutional galleries? In this discussion, we have seen some initial activity in this new social dimension: the RRDL, the PPEA, and the Cantus database all invite collaboration in database creation.

Whatever the future of the scholarly edition, the survey of North American researchers, projects, and initiatives is clear on one point: medieval studies is well on its way to becoming a digital system. The scholarly edition must respond accordingly, and digital approaches must be embraced as serious academic pursuits. Computer technology is a fundamental component of even the most conservative medievalists’ work. Paradoxically, a return to parchment and ink is indeed in order, and digital access has made this possible. North American digital medieval studies, however vigorous and innovative, lag behind European institutions who have maintained a tradition of training in codicology, paleography, and philology. American and Canadian institutions will need to respond accordingly; graduate students in medieval studies, eager to embrace the Digital Humanities, will need courses in codicology and palaeography to reap its benefits.

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**APPENDIXES**

**Selected North America Digital Projects**

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2. British Library, John Rylands University, University of Leicester, Loyola University Chicago: Malory Project.
4. Brown University; University of Massachusetts, Amherst: Decameron Web.
6. Dartmouth University, Princeton University: Dartmouth Dante Project.
8. Early Manuscripts Electronic Library.
10. Indiana University: Le Roman de Flamenga Corpus.
11. Johns Hopkins University, Bibliothèque nationale de France: The Roman de la Rose Digital Library.
12. Johns Hopkins University, Stanford University, Binghamton University, université Paris XIII: Bible Historiale Manuscript Portal et Bible historiale.
16. Princeton University, Portland State University, Baylor University, Dickinson College: The Princeton Charrette Project.
23. University of California, Los Angeles, University of Virginia, University of Vienna: Carolingian Culture at Reichenau & St. Gall.
24. University of California, Santa Cruz, State Archives of Mantua: Isabella d’Este Archive (IDEA).
27. University of Ottawa: Archives de Littérature du Moyen Âge (ARLIMA).
30. University of Toronto: Early Medieval Record-Keeping.
32. University of Virginia: Piers Plowman Electronic Archive.
33. University of Virginia: World of Dante.
34. University of Waterloo (MARGOT project), Johns Hopkins University, Bibliothèque nationale de France: Christine de Pizan Digital Scriptorium.
35. University of Waterloo (MARGOT project): The Electronic Campsey Project.
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ABSTRACTS

This review article sets out to account for the role Digital Humanities plays in the editing of medieval texts in projects of Canadian and American digital medievalists. This study surveys the most important developments and trends in the last 15 years of digital text editing. Specific North American projects are profiled to examine how new methods and techniques are deployed. These projects include The Roman de la Rose Digital Library, John Hopkins University; The Princeton Charrette Project, Princeton University; The Piers Plowman Electronic Archive, University of Virginia; and The Cantus Database, University of Waterloo. This survey studies the advantages that digital text editing brings to both medievalists and the general public.

Cet article cherche à comprendre les pratiques de l'édition de texte en Amérique du Nord de ces 15 dernières années avec un regard particulier sur la réalisation des projets d'édition numérique. La discussion vise à donner un panorama bibliographique des éditions numériques les plus importantes de cette période et à examiner les problèmes théoriques associés à la transformation de la page manuscrite en page numérique. À partir d'une sélection représentative de projets, l'article analyse le développement des méthodes et des résultats d'équipes novatrices tels que The Roman de la Rose Digital Library, John Hopkins University; The Princeton Charrette Project, Princeton University; The Piers Plowman Electronic Archive, University of Virginia et The Cantus Database, University of Waterloo. Cette analyse met en évidence le bénéfice apporté par ces projets aux médiévistes et à un public plus large.
Quest’articolo esamina i metodi e gli sviluppi della critica testuale nordamericana degli ultimi 15 anni con uno sguardo particolare sulla realizzazione di progetti digitali. Il saggio inizia con un sondaggio dei progetti digitali più importanti di questo periodo, mettendo in risalto specialmente i problemi teorici nel trasferimento del testo stampato allo schermo. Attraverso una selezione di progetti rappresentativi, il saggio traccia le innovazioni e i metodi di squadre di ricerca quale The Roman de la Rose Digital Library, John Hopkins University; The Princeton Charrette Project, Princeton University; The Piers Plowman Electronic Archive, University of Virginia; e The Cantus Database, University of Waterloo. L’analisi evidenzia soprattutto i vantaggi che questi progetti offrono sia ai medievisti sia ad un pubblico più esteso.

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