Purposes and Challenges of Digitized Collections for the Humanities in Academic Libraries

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Abstract

This paper examines the participation of academic libraries in the emerging multi-disciplinary field of digital humanities. Mass digitization efforts involving cultural objects are explored in depth. A comprehensive literature review is undertaken to identify the purposes of these initiatives, the challenges to developing large-scale digitized collections, the challenges to granting users intellectual access to such collections, as well as means for addressing these challenges. Topics covered include, but are not limited to, organizational restructuring, leadership in library administration, metadata assignment, preservation of digital items, user needs assessment, digital collection development, and providing virtual reference services. Recommendations for adjustments to practice in the information professions given the implications of these developments are discussed. Conclusions are drawn based on evidence identified.

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1 Introduction

Large-scale digital collections in academic libraries are typically associated with revolutions in the sciences, but substantial and growing collections of digitized cultural artifacts are enabling new levels of understanding in the humanities. Three decades ago, scholars would have had to travel to the Library of Congress in order to visually examine items such as Walt Whitman’s original notebooks, but research of this kind may now be conducted simply by visiting the American Memory Project online. The growing ubiquity and user-friendliness of academic information systems has given rise to the new field of digital humanities; an inter-disciplinary endeavor that unites scholars in the humanities with librarians, archivists, and information systems experts to leverage digital tools and techniques in search of new insights into the human condition. The majority of the mass digitization efforts that have enabled and catalyzed this new mode of inquiry are taking place in libraries, particularly in academic libraries (Flanders & Mylonas, 2010). As user demand grows for the digitization of cultural research material, the academic library community will need to pay close and careful attention to the changing information needs of scholars and students of the humanities.

The management of digital assets presents new challenges to the academic library community in terms of administering complex hardware and software, but mass digitization has not changed the fundamentals of library services. The ephemeral nature of digital items will require more expense and staff attention in meeting preservation commitments, but the relationship of user needs to item selection and organization remains essential. The complexities involved in supervising intricate information systems optimized to meeting very specialized user needs will require a strategic approach to management that takes into account the role of digitized collections within the larger context of the library and parent organization (Currall & Moss, 2010). Guiding users to the items most suited to their information needs becomes a very different task as service points become more remote, but the digital environment brings with it increased possibilities to meet the traditional goal of providing personalized services to every user (Turock & Friedrich, 2010). New tools will require new skills for effective use, but an expanded toolkit will empower information professionals to become even more effective at meeting the challenges they have risen to for millennia.
2 Literature Review

The inter-disciplinary study of digital humanities represents a very new field of inquiry, and understanding of the consequences of mass digitization of cultural objects is just beginning to take shape. A comprehensive review of the literature was undertaken with the goal of identifying the purposes of digitized humanities collections in academic libraries, the structural challenges inherent in such efforts, the challenges of providing user access to digitized collections of cultural artifacts, as well as methods that might be employed to overcome these challenges. Emphasis was given to library and information science literature, although the literature of related fields such as archival science and information systems studies was reviewed as appropriate. The review of literature was comprehensive, though certainly not exhaustive. It is intended to provide an overview of research in digital humanities as it pertains to the practice of information professionals.

2.1 Purposes

Dalbello (2011) provided extensive discussion of the purposes of digitized cultural collections through her thorough intellectual history of digital humanities. She referred to such collections as electronic campfires, noting how digital collections inspire global and inter-disciplinary collaboration among researchers interested in a given time period, mode of expression, or method of inquiry. Dalbello also noted that the networking of digital items frees artifacts from the context of a particular archive or collection, thus allowing new critical interpretations through meta-analysis. Also of note was the democratization of access to rare items, as remote access enables viewing by non-experts. Dalbello explored the possibility that such collections might stimulate a revitalization of cultural studies despite diminishing institutional support for the humanities by inspiring a new wave of interest from students and the public.

Sternfeld (2011) explored the purposes of digitized collections in the humanities through an evaluation of the uses of digital archives of historical materials. He noted the growing trend of collaboration across disciplines in historical research, in particular citing a joint study of researchers from Harvard, MIT, and Google who performed a quantitative textual analysis of 5 million works published between 1800 and 2000 (approximately 4% of all literature ever published) for which adequate metadata was available. The investigators claimed to have identified unique documentary markers that provide evidence of previously unknown events such as instances of government censorship. He also noted the uses
of such collections in teaching, which is increasingly blurring the boundaries between research and pedagogy. Sternfeld expressed dismay at the so far confused and disjointed nature of digital efforts in history and proposed a theory of digital historiography to guide future mass digitization initiatives.

2.1.1 Preservation and Access

One of the greatest benefits of mass digitization initiatives is that fragile items can be preserved by removing the need for physical handling while providing a much higher level of access to rare items at the same time. Matusiak and Munkhmandakh (2009) explored these benefits in their case study of building a digital collection of Mongolian newspapers. They noted that newspaper collections are in particular need of digitization as the paper used for the physical items is of very low quality and prone to rapid disintegration even under ideal archival conditions. The volume of these collections also gives rise to a need for digitization as physically searching through such items can be extremely time-consuming. As resources for the project were limited, stringent selection criteria had to be applied. Newspapers published from 1990 until 1995 were chosen as this was a period of momentous historical change representing the transition from Soviet bloc repression to democracy and free markets in Mongolia. This era also saw an explosion of new media in Mongolia, with over 600 new newspapers registered during the period of coverage, thus collecting these items into a searchable online index promised to be of great benefit to researchers.

Bishop and Rock (2010) also explored the benefits of preservation and access through their case study of international collaboration to build a digital collection of items relating to the experience of ethnic Germans in Russia. The initiative sought to build on an existing collection of digitized tapes, manuscripts, books, and other artifacts documenting the experience of German-Russian immigrants to Colorado developed by Colorado State University Libraries. Historians and librarians travelled to the Saratov province of Russia in order to locate archival materials relating to the experiences of ethnic Germans during the Imperial and Soviet eras and work with Russian archivists in a joint digitization effort. This allowed for the preservation of artifacts that suffered greatly from neglect and lack of archival resources during the Soviet period. Their efforts also resulted in many items becoming available to researchers that had previously been inaccessible to Western scholars by any means.
2.1.2 Meeting Information Needs

Academic user populations will often have the most complex user needs. This is especially true for the humanities, as researchers will require access to items in an array of formats that are often unique and housed in dispersed geographic locations. Rimmer, Warwick, Blandford, Gow, and Buchanan (2008) explored the user needs of humanities scholars with focus on the potential of mass digitization initiatives to meet these needs through focused interviews with researchers. The consensus opinion of participants was that physical interaction with items was preferred, although well-designed collections of digital surrogates can greatly enhance their research. The prohibitive expense of travel was noted. One participant stated that he had to shift the focus of his research after moving to Australia. Warwick, Terras, Galina, Huntington, and Pappa (2008) investigated the potential of digitized collections to meet the information needs of humanities scholars through server log analysis and questionnaires. Their analysis indicated a central role for libraries in remote research as students and scholars will need to sift through a plethora of digital surrogates available from many different sources. The organization of information provided by librarians was found to be essential; even searches of outside resources most often began through gateways or pathfinders on library Websites.

Ge (2010) looked at the needs of faculty members and doctoral students in the humanities through focused interviews. He discovered a growing reliance on electronic sources of information with 96.7% of participants using the World Wide Web for research and 90% using library databases. He noted a particular interest in digitized items among historians, as their use of online catalogs and indexes to locate appropriate primary sources has grown by a great deal in recent years. Many participants expressed a desire for more organized and selective sources of online information due to the problems of information overload, mixture of relevant with irrelevant sources, difficulty in ascertaining the credibility of sources, and difficulty in retrieving precise search results they experienced on the Web. Du and Evans (2011) also explored academic information needs through observations of search sessions conducted by doctoral students researching their dissertations followed up with focused interviews. They noted a need for diverse information resources as 91% of participants searched multiple sources of information. They also noted the need for strong search functions through user-friendly interfaces, as 82% of participants first searched either Google Scholar or Google Web for these stated reasons. Digitized collections can offer humanities scholars the diversity of resources they need, but adequate discovery methods will need to be in place in
order to provide access.

2.1.3 Expansion of Services

Choudhury, Furlough, and Ray (2009) explored the possibility for expanding user services through digitized collections in the humanities by merging digital curation and digital publishing. They defined digital curation as the comprehensive management of every aspect of the creation and management of digital information, from the selection of primary sources to the publishing of research reports. As an example of this new, far more expansive approach to library services in the humanities they pointed to the creation of a Digital Collections Curator position at Pennsylvania State University Libraries. This allowed for oversight of digital collections of primary sources, such as images, books, newspapers, and manuscripts, as well as collaboration with the Pennsylvania State University Press to publish monographs based on investigation of those items electronically. The recommendations of Choudhury et al. are especially helpful in light of the continued emphasis placed on monographic research output by academic departments in the humanities despite the diminished capability of the scholarly press to publish such items (Williams, Stevenson, Nicholas, Watkinson, & Rowlands, 2009).

Shelburne (2009) touched on the possibilities for expanding user services through digitized humanities collections with her survey of e-book usage by patrons of a large academic library. The study demonstrated that remote access to digital items has certainly fulfilled the needs of users as 60% of faculty members, 60% of graduate students, and 55.5% of undergraduates had used e-books offered by the library. Furthermore, 78% of e-book users indicated that these items were used for research purposes. This suggests academic libraries could greatly enhance access to primary sources in the humanities through digitizing such items and providing access to these surrogates across multiple platforms. In particular, one participant noted a preference for Google Books as an e-book provider due to the wide availability of research material in his/her field of 19th century literature. Several weaknesses of the e-book platform were noted by participants that will need to be addressed in order to provide an optimal level of access to a digitized humanities collection. In particular, one faculty member expressed disdain for a user interface that was designed to access items sequentially, discouraged “multi-dimensional thinking,” and prevented side-by-side comparison of items.
2.2 Development Challenges

Several organizational challenges must be overcome by any library seeking to build high-quality collections of digitized heritage material. Lynch and Carleton (2009) surveyed several of these in their exploration of changes in research libraries as a result of digital scholarship. They stressed the importance of visibility, as funding bodies have developed an increased concern in how outputs will be shared. They also pointed out the need for collaboration rather than competition among institutions, as the management and access tools needed to provide intellectual access to such large collections while maintaining quality required “economies of scale” (Lynch & Carleton, 2009, p. 237). Brindley (2009) also took a comprehensive approach in her discussion of challenges facing libraries serving digital natives. She pointed out the need for academic libraries to position themselves as strategic assets for their parent organizations that are deeply embedded in every aspect of research and learning. Brindley stressed the need for leadership and vision, as a new generation of users will not pay attention to digital services that simply replicate information services freely available on the Web. She warned that failure to adapt to the new information environment would relegate libraries to the status of mere “museums of the book” (Brindley, 2009, p. 5).

Dougherty (2010) looked at the problem of competition from other information service providers in his treatment of Google Books. He pointed out the shortcomings of the project in descriptive metadata, as Google uses approximately 3,000 subject headings compared to the over 200,000 subject headings in the Library of Congress schema commonly used by academic libraries. Collections of similar type and scale that were prepared with the rigorous metadata application practices found in the academy could enable greater scope and accuracy in studies of the type reviewed by Sternfeld (2011). Dougherty (2010) also pointed out that a for-profit corporation has no preservation responsibilities, thus making them a poor choice of conservators for the collected experience of humanity. Manžuch (2009) also dealt with questions of the value of digital collections in his analysis of methods used to monitor large-scale digitization initiatives. He noted the difficulties in peer group comparison due to ambiguous units of measurement, as different file types will differ in the amount of storage and bandwidth necessary for delivery. The study also noted the absence of user-centered methods of evaluation, such as usability and accessibility, from monitoring criteria. Manžuch concluded that digital collections managers should focus on developing better means of measuring and reporting performance as memory institutions are typically responsible.
to an outside body for funding.

Cunningham (2010) discussed organizational challenges to digital humanities projects in her examination of collaboration between librarians and faculty. She noted the difficulty in garnering support from academic departments for such projects due to the preference for traditional research projects and outputs during tenure and promotion reviews. For example, only 9 sessions out of hundreds at the 2010 meeting of the American Historical Association related to digital undertakings. Cunningham recommended vigorous outreach to faculty in order to initiate digital projects and very active instructional and support roles for librarians in order to sustain them. Rieger (2010) explored the problem of increasing expectations for digital library collections due to the proliferation of scholarly information freely available on the Web. She noted the high cost of large-scale digitization initiatives in the humanities as they typically involve rare special collections with costly physical handling requirements and preservation imperatives. Rieger stressed the need for sound business planning in order to ensure reasonable expectations on the part of libraries and funding agencies.

Conway (2010) focused on organizational change necessitated by large scale digital preservation requirements. He noted that the process of digitizing heritage material is a very different task from preserving the digital surrogates. Conway pointed out the changes brought on by the acceptance of digitization as a preservation strategy by the Association of Research Libraries. Many heritage organizations were found to be facing budget crises due to the growing preference of stakeholders for expensive digital methods and could soon have to abandon the preservation of physical items in order to keep up with demand. He also pointed out that mandates for digital preservation will likely increase as it is the only feasible method for preserving media recorded on magnetic tape. Conway concluded that the current project-based workflows for large-scale digitization initiatives are untenable and that memory institutions should acknowledge the permanence of their commitments by restructuring and seeking to close the expertise gap.

2.3 User Access Challenges

Dragon (2009) explored challenges to user access in her case study of creating name authority files for a digitized collection of postcards featuring local monuments in eastern North Carolina. She discussed the larger issue of visual items that are typically hidden in special collections; such collections offer users a view of places and structures without the coloration of another’s opinion of it, as they would find in a book. By making digital surrogates available online, the library
makes valuable artifacts of local history available beyond the local area. The decision was made to catalog the items in standard MARC format using Library of Congress Subject Headings and Library of Congress Name Authority Files. The rationale for this decision was that linking the digital image to books about the same place in catalog records would be easier if the images were cataloged in as similar a manner to existing bibliographic records as possible. This resulted in 316 name authority records created by the cataloger. While future items relating to these places will be assigned the same terms within that library’s catalog, it will make unified searching from other catalogs or the Web more difficult due to the lack of standardization in terminology.

Kowal and Martyn (2009) discussed similar challenges in metadata assignment with their case study of cataloging digital surrogates of maps from rare books in the British Library collection. These items are not available for public viewing, and placing the digitized images online greatly enhances access to these items. Some of the books are hundreds of years old, and the maps from them will likely be of interest to historians. The authors discussed several metadata formats based on the eXtensible Markup Language (XML) that are highly recommended for their ability to be recognized and processed by a wide variety of search mechanisms on the Web. The decision was made to catalog the items in standard MARC format as this made the bibliographic data more easily searchable from within an Integrated Library System (ILS). The British Library uses an ILS that can link the digital image files to the catalog records of the books they were developed from, thus users searching for those books will be able to see images of the maps within them by clicking a link from the item view in the catalog. In this way, access is granted to the digital items online. However, the choice of metadata assignment makes these items invisible to Web search engines and other far more heavily used online search mechanisms. Kowal and Martyn felt that the problem would be resolved at a future date due to planned migrations to XML-based MARC formats, but the lack of visibility limits access to these items for the present.

Lukasiewicz (2007) examined the problem of remote users of academic libraries experiencing difficulty finding relevant research material online due to disintermediation. Disintermediation refers to users searching collections without any human intermediary to assist them. This is increasingly common in academic environments due to the growth of distance learning and the preference of younger undergraduates to use technological rather than traditional tools for research. Lukasiewicz found that well-designed Instant Messaging (IM) reference services can alleviate this difficulty among users as they will not feel so alienated by a remote environment if human interaction is present. She also recommended
more user-friendly design for online library portals as well as the creation of new resources that are tailored to the needs of users accessing library services through the Web. In this way mass digitization efforts can directly decrease disintermediation among users if efforts are organized according to patron needs, as users feel that library services are more “personalized” when they are tailored to their needs.

Parandjuk (2010) investigated the problem of users experiencing difficulty in locating appropriate items in digitized collections due to poor user interface design through her usability analysis of the Publication of Archival Library & Museum Material (PALMM) digital library gateway. The site serves as a directory of links to digital library collections maintained by several Florida universities and other partners. Parandjuk’s analysis revealed several barriers to user access through poor design. There was little sense of connection across sites. While there was a banner with a link to return to the PALMM home page, there was no mechanism to search across the dozens of separate collections. She recommended integrating all searching and browsing features, as well as consistent language and design to provide users with a sense of context. She also recommended the addition of a tool for user-generated metadata, commonly known as “tagging.” This would enhance user ability to find desired items as every item will be assigned metadata by the audience it is most appropriate for. Parandjuk recommended closer cooperation and standardization among libraries offering online digital collections as well as use of the principles of information architecture in order to assure user interfaces maximize access to information objects.

2.4 Addressing Challenges

Conway (2010, September) proposed to address the problem of funding and demonstrating value for digital preservation initiatives through better Quality Control (QC) processes for textual items. The measure was intended to rectify QC issues with digitized books deposited in HathiTrust, a depository consisting of more than 5 million items, which will be universal enough to apply to Google Books, digitized textual items in the Internet Archive, or any other digitized book collection. The process proposed would differentiate between human errors (e.g., pages not scanned) from machine errors (e.g., faults in optical character recognition software). All items would be inspected by the QC software, which would then assign a random sample to human inspectors to ensure there is no fault with the automatic processes. The system would also allow users to flag items when they recognize flaws. This process should greatly reduce the staff hours required for QC inspection; at the same time it would re-assure funding bodies that all items in
the collection are fit for use. It should also provide an objective metric of the type recommended by Manžuch (2009) while addressing the organizational changes that Conway (2010) identified as necessary.

Mullen (2011) advocated for collection development practices that could address the problem of lack of visibility for items in digitized collections. She noted many sources of digitized books available online, such as HathiTrust, and noted that bibliographic data in MARC format is available for some of these books as well. Digitized collections raise new possibilities for cooperation between libraries. One library can now provide a theoretically infinite number of partners with copies of some items, limited only by bandwidth and storage capacity rather than the number of physical items. Mullen warned that collecting open access items available online requires a very different skill-set than acquiring traditional items. Collections development librarians who expand their horizons in such a manner will have to vet potential acquisitions along measures of digital quality along with applying traditional criteria, and fewer selection aids will be available. Doing so can be of tremendous service to users however, as it can add many high quality items to library collections that can be made available to users and other libraries with a minimum of effort and expense.

Chen (2010) sought to address the problem of poor visibility for digitized items through the use of Artificial Intelligence (AI) tools for ILSs. The study noted that few library patrons will ask staff for help in locating items, most users view libraries as places to find books rather than electronic items, and that both traditional and electronic library use was highest in academic libraries. Chen proposed the addition of AI agents that will carry out user searches far beyond the library catalog it originated from. Such a system would automatically link to other ILSs if no items in the local catalog fit the search parameters. This solution could address the issues of item visibility raised by Dragon (2009) as well as Kowal and Martyn (2009).

Hsieh et al. (2011) proposed to engage students in a digital collection of literary items through the use of interactive features accessible through mobile platforms. The City of Lit digital collection at the University of Iowa features manuscripts, photographs of literary landmarks, as well as audio and video of author interviews and readings. Students can participate in adding value to the collection through the use of applications, or “apps,” accessible from the Apple iPhone and iPad mobile platforms. For example, students could use Global Positioning System (GPS) features to add coordinates to geographic items. This data would allow users of the collection to find monuments such as author residences through their mobile devices. In this way students were encouraged to use the
collection through interaction, and they also encouraged other students to use the collection through making the additions they find most valuable.

Hendrix, Chiarella, Hasman, Murphy, and Zafron (2009) identified a unique opportunity for outreach and a new online service point for academic libraries through their survey of the use of the Facebook social networking platform by academic health sciences libraries. Facebook was found to be popular among academic users, as the authors noted that a related study found 44.5% of participating medical students indicated they had a Facebook account. Of the 72 libraries polled by the study, 61 replied that they did not have a Facebook account. Of the 11 libraries that did have a Facebook presence, 6 replied that Facebook was used to make announcements, post photos, or for other marketing activities. Other libraries actively used Facebook to provide services, with 5 using the IM feature to provide reference services, 2 providing a Facebook app to provide catalog searching, and 2 using a Facebook app to provide database searching. These innovative uses would allow librarians to direct users to items in digital collections that are most appropriate to their needs in a forum most suited to their preferences. Students were also found to form groups that conveniently allowed the library to tailor its outreach to specific classes, areas of concentration, and academic levels. Such outreach and service methods would likely reach an even greater proportion of undergraduate users given the preference for online access that was noted by Lukasiewicz (2007).

Broussard (2012) identified an original solution to assisting patrons in digital environments in her analysis of online games offered by academic libraries. While some were judged to be little more than novelties, others had the potential to teach valuable information literacy skills to patrons. Broussard noted the capacity of online games to teach skills such as solving problems in groups that librarians struggle to impart in more traditional settings and encouraged libraries to develop games with design and interactive features that can hold the attention of students. Oakleaf and VanScy (2010) also proposed teaching information literacy to patrons in a non-traditional environment with their study of instructional strategies for digital reference. The investigators analyzed transcripts of online reference transactions and observed several instructional strategies that proved to be both effective and appropriate for that environment. Simple measures such as walking students through every step of an information search and using links to ensure students are looking at the same screen views as librarians were found to be quite valuable pedagogical methods. Oakleaf and VanScy noted that few virtual reference transactions showed any evidence of instructional technique, despite the fact that virtual reference provides librarians with ample teaching opportunities.
3 Discussion

The proposals of both Broussard (2012) and Oakleaf and VanScoy (2010) could quite possibly be effective methods of addressing the lack of information literacy skills that Brindley (2009) identified as impeding user access to digitized library collections.

Buckland and Godfrey (2009) advocated another unique solution for disintermediation with their study of the possibility of using virtual worlds such as Second Life as an access point for reference transactions. They noted that patrons in a variety of settings will sometimes be reluctant to approach a librarian for help due to the body language of the librarian or for fear of appearing ignorant. Librarians at two Canadian universities set up a virtual library in Second Life. Staff was only available to assist patrons for a limited amount of time during the week, but there were other benefits to the virtual space. Digitized collections were showcased in a digital environment and slideshow tutorials were available to assist patrons when staff was not available. The virtual presence of the library also proved effective in aiding distance learners who did not always have time to visit the library in person. The authors noted the increase in digital resources offered by libraries and urged that support for identifying these resources be available to users through digital means.

3 Discussion

Literature review suggests that library services in digital humanities are reaching a tipping point. Demand for digital items among academic users is high and growing. Analysis of user needs indicates that adjustments of library services from a traditional orientation that emphasizes physical resources to a contemporary orientation that emphasizes digital resources could result in more helpful and personalized services than ever before. Preservation of digital items is certainly more intensive in terms of time and resources than physical preservation, but it has the potential of keeping all identified items available to all who desire to interact with them for far longer. The only limits to time of preservation are organizational, not physical. Certainly such a radical change will take time and will be quite disorienting for mid-career information professionals. However, the potential benefits to users certainly justify the effort.

This is not to say that new techniques should be implemented simply because they are new, and user need should be the only driver of any change. User needs analysis should be continuous and ongoing at every level of service. Academic libraries should take great care in researching the exact needs of every segment of
their user population and carefully weigh patron desire against resources available. Smaller institutions are not likely to possess the expertise or funding for large scale digitization initiatives at present levels of cost. However, it would be beneficial for such libraries to find ways to take advantage of shared resources. Once collections have been digitized, they have been removed from the boundaries of geography.

In order to continue providing access to digitized collections of the scale that users desire, reorganization at institutions undertaking large scale digitization initiatives will likely be necessary. More importantly, there should be a fundamental shift in how such collections are viewed. Rather than special collections of unique material, they should be treated as essential parts of the circulating collection. Indeed, digitized surrogates can circulate endlessly without any wear on the item whatsoever. Rather than being treated as special projects, acquisition and maintenance of digital items should be viewed as essential components of a library’s day to day operations. The rate of digitization indicates that already massive digital collections will grow at an exponential rate, and the institutional support to ensure that these valuable cultural artifacts are not lost must be in place. Secure and stable sources of funding must be identified in order for this transition to take place. The current patchwork of government grants and corporate philanthropy is unlikely to remain in place long enough to ensure preservation of all items digitized, and library administrators must fundamentally rethink their budgets if they want to keep what they have acquired.

In order to maximize user access to digitized collections, a much greater level of collaboration and standardization between libraries will be necessary. The more connected library information systems are, the more visible digitized items will be and greater visibility increases the chances that patrons will discover what they need. In order for this to happen, metadata format and assignment will have to be standardized and facilitate discovery on the open Web. MARC formats intended to provide physical descriptions are not likely to offer patrons a useful description of digital items. The current dizzying array of schema used in various digital collections are not likely to provide the unified discovery mechanism patrons need to navigate an information environment where the amount of items available is constantly growing by orders of magnitude. A very flexible yet descriptive XML-based schema such as the Dublin Core Abstract Model (Greenberg, 2010, p. 3620) will need to be adopted in order to facilitate discovery across catalogs and across the Web.

Users of academic libraries are migrating onto the Web for their information needs, and library services must migrate with them if those needs are to be met. Digital collections should be available through user-friendly search mechanisms
that are as powerful and easy to learn as Google. It is highly unlikely that so many people would be using Google were it not meeting very real information needs. This is not to say that libraries should be search engines, but some changes must be made in order for libraries to compete with search engines. User interfaces should be rationalized according to principles of information architecture. Many patrons who have expressed preference for physical items stated that browsing such collections enables better resource discovery. With virtual worlds such as Second Life, there is no reason why patrons should not be able to browse a digital collection in exactly the same manner. Digitized items could be visualized as a bookshelf, and value can be added through search mechanisms that allow the user to rearrange the bookshelf at will.

A collection that resides in a digital environment can invite new levels of user interaction. Mobile apps can direct a patron to the location of a monument in a digitized photograph through GPS features. Users could even upload a current photograph so that other patrons can observe changes in that location over time. Collections can be shared with patrons over social networking sites such as Facebook. Specialized search and browsing apps can allow patrons to make new discoveries from the Web, from their mobile devices, or embedded within any number of digital locations they frequent. Librarians can be available to provide reference assistance to patrons from their email interface, mobile IM, or Facebook chat. Users do not need to be cut off from human interactions when accessing their libraries remotely. Indeed, a digital environment offers more opportunities for librarians to interact with their users, not less. Librarians can be anywhere to assist and to teach. No opportunity should be missed to enable patrons to access digitized collections and use them to access, adapt, and create knowledge (Warschauer, 2010, p. 1552).

4 Conclusion

The information professions are coming untethered from physical boundaries, and many familiar old patterns will cease their ancient rhythms. One of the most difficult aspects of digital curatorial management is the blurring of customary boundaries. There is now little, if any, difference between an archive that holds a unique instance of an item, a library that loans one copy of an item among many, and a gallery that puts items on public display (Currall & Moss, 2010). The physical items from which digitized collections are built are often unique, but their digital surrogates are not. The cost of allowing patrons to copy and keep such an item is
negligible. Such an item could be placed on a high-traffic Web page that results in millions of copies being requested and displayed in browser windows. Some copies may only exist for seconds. The sheer ubiquity it is possible for a digital file to achieve allows items in digitized collections to serve patrons in ways that no physical item ever could.

Some constants do remain, and among those are the core values of the information professions. The importance of a digital object lies in its intellectual value, not the technical wizardry required to create it. Librarians remain the stewards of the world’s cultural treasures, and must always be mindful of the trust others have placed in them. Academic librarians are the gatekeepers of learning, and should always keep in mind their goals of the creation and dissemination of knowledge. Indeed, the motivation of librarians to participate in the mass digitization of cultural artifacts comes not from any new technology but from a very old commitment to service. The results of our success can be found in the ease with which so many people can see what was once reserved for a very few at the push of a button. Never before has so much knowledge been shared with so many, and never before has it been easier to discover what it means to be human.
5 References


