Museum Technology and Scholarship

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MUSEUM TECHNOLOGY AND SCHOLARSHIP

by

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In the 21st century, technology permeates nearly every aspect of society. The process of scholarship and the way information is retrieved and utilized has been affected by technology. The museum has undergone efforts to incorporate technology into its operations, from interactive exhibitions and digital collections to social media websites. In a technology-infused world, museums must strive to be relevant to all of their audiences, including to its scholars and professional researchers. Museums also have to contend with external influences, such as social and economic trends, that affect museums’ decisions on many operational aspects, including whether or not to implement technology to assist scholars in their work at the museum.

This thesis serves to discuss museums’ current contributions to scholarship and the research process involving technology such as websites, digital collections, and other types of digital offerings. It will briefly discuss each of these technologies and how they relate to the scholar’s experience. Such issues as intellectual property will be addressed. This thesis will also explore the relationship between the museum and the scholar, both presently and its implications for the future. The relationship between the scholar and the museum will be analyzed through interviews with current museum professionals, some of which are scholars themselves. Through research in current literature, as well as extensive interviews and surveys of today’s museum professionals, this thesis will demonstrate that scholarship is in a current state of flux between its traditional roots and digital future. Although the scholarship process has not essentially changed in the wake of museums upgrading their infrastructures presently, it has been greatly enhanced by the tools offered to the museum.
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Introduction

In the 21st century, very few institutions are without some type of technology integrated into their framework. Museums are no exception. A wealth of technology is available to the museum to enhance nearly every aspect of its operations, from its collections to its digital presence in today’s society via the Internet and social networking. There are technology solutions that a museum can utilize to create a digital presence, such as the Internet, digital collections, (either for in-house use or made available to the general public), as well as applications for use in exhibitions. The technology that museums can implement can enhance the experience at the museum for all of the museum’s audiences, both casual and professional. Bonnie Pitman outlines the concept of a museum best when she described them as "gathering places of objects and ideas that assist individuals in understanding the world around them."1 Most museums have two core components to their mission: to preserve (whatever it is they have in their collections, whether it is art, artifacts, specimens, or information) and to educate. MacDonald and Alsford state that public museums were created for the same reasons public libraries exist; that "knowledge is a public good and that public pools of information are necessary."2 They also state that one of the traditional functions of the

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museum is the generation of information by scholars who study the museums' collections\(^3\).

Our current civilization is experiencing a shift from a commodity-based society to a learning-based society, one in which information is more valuable than the object\(^4\). This new learning society places more importance on learning, and in turn, scholarship; this is the reason why museums have become more popular\(^5\). With such an emphasis on learning comes an influx of information. Museums are concerned with the following in terms of information: the generation of information by the research of museum professionals and those who study the collections; the perpetuation of information by conserving the knowledge and collections of the museum; the organization of information, in the museum's collection as well as the museum's library; and the dissemination of information: the access to the information. MacDonald states that the organization component of the museum's information systems is fairly subjective; that it is the interpretation of the museum professional that dictates the organization of the content, but this is not the case with the other aspects of information in the museum\(^6\).

Museum information cannot exist without its physical components: its collections (the objects or the physical volumes of knowledge that the museum contains). This is true, but as more of the museum's information becomes digital, the reliance on the

\[^3\] Ibid., 74.


\[^5\] Ibid.

physical will be less, especially when concerning physical sources of information, such as books or journals. The reliance on the physical object will most likely remain for a long while, until technology makes it feasible for objects to be completely rendered digitally in a manner that appeases both the scholar and the museum. There are currently several technologies available that render objects and artworks digitally, which can satisfy the visitor’s and in many cases, the scholars need for viewing the object, yet they do not satisfy the museum professionals. A museum must be able to adequately represent their information; without it, a scholar/researcher can waste a good amount of time weeding through impertinent information and objects that do not relate to their work.

As technology changes the needs and demands of researchers, museums will need to keep up with their demands. In the museum, Falk and Dierking surmise that although there will be a shift towards the virtual museum, it will not replace the physical institution. Many museum professionals also agree with this statement. Presently, the same can be said for museum scholarship; although there are many tools for facilitating more and better quality research, as well as more open lines of communication between scholars, the act of physically researching at a museum still has an advantage over purely digital research. However, as younger generations (those who have been raised with large amounts of technology in their lives), replace today's museum professionals and

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8 Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.

9 Peniston, William. Interview by the author. E-mail interview. November 30, 2010.

10 Carr, Carolyn. Interview by the author. Phone interview. March 1, 2011.
scholars, that attitude of preferring physical versus digital methods of research may change.

This thesis will focus on the educational portion of the museum's mission; particularly, its focus on scholarship. Museums have several different audiences in their educational mission: the casual visitor, and the scholar. Museums today devote a great deal of resources to technology that enhances the visitor experience, but not necessarily to that of the scholar's or researcher's experience. Technology has infused many aspects of a museum's operations, including its operations as a center of research. Scholars are an integral part of why museums exist\textsuperscript{11}. Scholars have been using the museum as a major source for their work for a very long time, as they are not only repositories for the objects and works of art that they study, but they also contain a great deal of research materials, of which much is not available digitally. Scholars, in turn, complete original research and publish their work, which ultimately gets added to the body of knowledge at the museum\textsuperscript{12}. The position of the museum serving scholars and scholars in turn serving the museum can also be taken, in that museums act as a service organization, providing materials and services to scholars, and scholars, in turn provide the same to the museum, in a sense\textsuperscript{13}. This paper will examine the role of technology available to the scholar at the museum: what museums currently offer to the scholar, how technology has changed the research process at the museum, and the relationship of the museum and the scholar (both presently and its future implications). A brief history of technology in the museum will

\textsuperscript{11} Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.

\textsuperscript{12} Augustine, Susan. Interview by the author. Phone interview. March 1, 2011.

\textsuperscript{13} Grinols, Susan. Interview by the author. E-mail interview. February 14, 2011.
be included in order to provide the reader with background information on the role of technology in the museum and its current state.

In order to address the questions posed in this paper, one cannot rely on physical research materials alone. Perspectives from today's museum professionals and scholars are integral to determining the current relationship between the museum and the scholar. Technology is constantly evolving and changing, even in the museum. Thus, museum professionals would be a better resource in describing the current state of technology integration at their particular institution, and any plans for the future. They can also provide perspectives on their relationship with today's scholars. Museums are also influenced by outside social and economic factors; museum professionals can shed light on what factors currently influence their relationship with the scholar, what they currently offer to the scholar, and the future of the relationship.

Scholarship is currently in a state of flux between its roots and digital future. Much of the literature used in the research for this paper concerns not only scholarship in the museum setting, but also humanities scholarship in general. The current process of scholarship (research, writing, review, and publishing) may be considered sluggish for the pace of today's society, where updates and current research findings can be published in a much shorter amount of time. Digital scholarship can be considered incredibly malleable; it can change much more easily than printed scholarship. It used to (and still can) to take years of research, published articles, and books to prove or disprove another scholar's work. Now, it can take days, or even hours.\footnote{Soeffing, D. Albert. Interview by the author. E-mail interview. March 14, 2010.} Scholarship that utilizes
technologies such as wikis can be changed at an instant. With the significant influx of information that one can receive through technology, more emphasis is placed on analysis rather than the gathering of information. There will most certainly be more reliance on technology and less on the methods that do not use technology. There will also be more communication and collaboration, as technology has opened up the lines of communication between the scholar and the museum and between scholars in a significant way, through simple methods such as e-mail or as cutting edge as a wiki.

There may not be a change in the information that has been or is currently being produced, but rather the rate of production and the extremely swift rate at which that information is distributed. Likewise, there may not be a fundamental change in the way scholarship is perceived or practiced in today's society, but the pace has accelerated. One of the ways in which this acceleration occurs is in communication and collaboration. Borgman states that "online communication has accelerated the amount of informal communication among scholars and simplified the dissemination of formal products of scholarship"\textsuperscript{15}. This can lead to more review, more evaluation, and more questions, which can ultimately result in a better quality product.

Two examples of how electronic communication affects scholarship involve preprints and conference papers. Preprints (articles that have not been published) are now shared quickly among scholars and can even be seen by the public. Such applications like Google Scholar (which will be discussed later in this paper) are example of how preprints can be made available to the public. Conference papers are eventually expected to be

\textsuperscript{15} Ibid.
published in books or articles in journals. In the past, the time frame for publishing these materials was unknown. Some conference materials are presently made available on the conference’s website. Although not guaranteed to be permanent, they are made available more quickly for those who wish to read them than in the past. Although preprints and conference papers do not have the exactitude of a published scholarly work, the fact the information is made available quickly indicates a change in the desire to make that information available, rather than wait for the finished work or published conference paper. Technology has changed the means by which scholars communicate both publicly and privately as well as the underlying processes and functions of communication over the past few decades.

History

Although museums have been in existence for a very long time, they experienced a resurgence of popularity in the mid-20th century. With the increased recognition came increased responsibility. David Williams describes the phenomena of the museum's rise in popularity as "once the quiet, undisturbed sanctuary of scholars and researchers, museums were now seen as public trusts with duties and responsibilities to their collections, to their communities, and to future generations." There was also the necessity for increased stewardship of their collections and increased emphasis on the


17 Ibid., 74.


19 Ibid., 16.
mission of the museum, including the educational portion of its mission. Technology and computerization were the ways in which museums sought to satisfy those needs. The museums' first foray into computerization concerned collection management systems (including registration), and networks\textsuperscript{20}. The beginning of technology in the museum environment was first seen in the 1960s, as evidenced by the SELGEM project that originated from the Smithsonian Museum of Natural History\textsuperscript{21}. SELGEM stands for "Self Generating Master" and was a database in which the Smithsonian and eventually other museums could enter data. Similar projects formed around this concept, such as GRIPHOS (Generalized Retrieval and Information Processing for Humanities Oriented Studies) and MCN (Museum Computer Network) projects\textsuperscript{22}. The 1960s projects of SELGEM and GRIPHOS were very popular among museums. However, only large museums could really take advantage of them because of the vast amount of resources (financial, staff, space, etc.) they required. Smaller and mid-size museums were seemingly left without any type of system to utilize to integrate technology into their collection management systems.

With the introduction of the minicomputer in the 1970s came an increase of individual museum projects geared toward the integration of technology. Because of the increased affordability of the minicomputer, many midsize museums were now able to participate in the digitization of their institution. Because of the "do it yourself" attitude,


\textsuperscript{22} Ibid., 37.
the lack of planning, and the lack of knowledge about integrating technology in the museum, many of these projects did not come to fruition\textsuperscript{23}. By the 1980s, there was still a significant lack of applications/software that museums could use for contemporary computers\textsuperscript{24}. The 1980s witnessed the development of yet two more major museum technology projects: DARIS (Detroit Arts Registration System) and DAMIS (Detroit Arts Management System). DARIS was a comprehensive system for use internally at the museum, and offered a great deal of resources in terms of collection management. Like SELGEM and GRIPHOS it was unfortunately designed for use on mainframe computers, something many museums were without. DAMIS, on the other hand, was a bit more successful because it was free to nonprofit institutions (except for maintenance fees), but concentrated on the administrative functions of the museum (accounting, fundraising, membership, etc.)\textsuperscript{25}.

It was not until the 1980s that technology in museums really started to gain ground with the advent of readily-available desktop computers and an increased interest in technology as a whole by the museum field\textsuperscript{26}. The 1980s and 1990s were also when digital images became integrated into collections management systems\textsuperscript{27}, but only large museums undertook such efforts. By the mid-1990s, museum websites started to appear,


\textsuperscript{24} Ibid., 18.

\textsuperscript{25} Ibid., 19.


but again, only a few museums undertook the effort at that time. Many museums were fearful that any technology they selected would soon become obsolete, meaning wasted precious resources. Fear of being obsolete, Williams states, was and is a big concern among museums, and their primary reason for not integrating technology into their institutions. However, some basic technology, in many cases, is better than none at all.\(^{28}\)

**Museums' Current Offerings to Scholarship**

Digital content for humanities scholarship can be grouped into several categories: digital collections or databases that hold object information or works about a particular object, history, etc., search engines for retrieving data related to the scholar’s work (which could be considered part of a museum’s collection management system, but separate in other humanities applications), and applications that allow for communication and collaboration.\(^ {29}\) In a study conducted by Oya Rieger, interviews with humanities scholars indicated that even those who did not identify themselves as tech-savvy did use the basics, such as search engines and e-mail. However, they did not go out of their way to use new technology applications related to their work.\(^ {30}\) This is also reflected in interviews with museum professionals about their research and access to information at their institutions; even those who are hesitant to use any technology did use the basics. There may be other reasons why humanities scholars do not go out of their way to use.

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\(^{30}\) Ibid.
targeted applications (such as taking too much time and effort to master the system, too much information to remember, economic and financial factors, etc.)\textsuperscript{31}. Rieger also states the same findings about bibliographic management applications; scholars are slow to use these applications because it takes too long to learn, even though they could assist them greatly in their work. Rieger notes that in order to get scholars to utilize new technologies, they need to be provided with support\textsuperscript{32}.

None of the museum professionals or scholars consulted for research mentioned any other types of specific applications that can assist them in their scholarly work. However, they do cite museums' websites and e-mail as general technologies that they use in the course of their work and/or study. Scholars that are utilizing new technologies need to be provided with support in the form of specialized applications geared towards their work so they can spend more time on their work rather than trying to understand and navigate through the technology.

One cannot discuss technology and the museum without discussing the Internet. According to Varisco and Yates, the Internet connects more people to the museum without actually visiting it; it also provides more material much more quickly than traditional research\textsuperscript{33}. A researcher, at one time, would have to pour through different catalogues, collections at a museum, books, articles, and so forth in order to achieve some information. This may take days, weeks, or months. The Internet has reduced this amount

\textsuperscript{31} Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.


of effort greatly; a simple query on a web-based database or search engine yields results in a matter of seconds, and often filters these results by relevance. All of the museums consulted in the research for this paper offer some information to the scholar, although in varying states of depth and breadth. What they all offer is some type of digital resource devoted to their collections.

**Digital Collections**

Museums, being repositories of objects, are first and foremost concerned with their collections. Moreover, they are concerned with the representation of their collections when presenting them digitally. In an effort to remain relevant to the general public (who expect some type of digital presence from the museum) museums publish some or all of their collection digitally, often within their website, for the visitor. Fiona Cameron states that collection databases "form the starting point that museums may define and communicate the significance and heritage values of objects." Collections are rooted in an empiricist manner, which began in the 19th century, and consist of describing an object's physical attributes, and leads to an interpretation of an object. Digital technologies are slowly changing that method from describing into one of relationships.

Digital collections are typically searched via text-based searching, which matches results based on text inputted by the user. The text inputted by the administrator of the database to describe a particular work is matched against the search criteria, and results

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35 Ibid., 83.
are generated. There are also additional methods of searching a digital collection: by concept and by content. Concept-based searching (as described by the authors) is a method that searches by people (artists, curators, and owners), activities (creation and acquisition), places (where an artwork is located), techniques, medium, and other criteria. Content-based searching is more of a visual-based search. Content-based searching may be helpful to the scholar in terms of finding related objects from which to base their research, and also comparing similar works to prove or disprove their hypotheses. Each of these methods of searching individually still may not provide detailed results; however, when used in conjunction with one another, a user may be able to identify relevant works in a much more efficient manner if given access to these different methods of searching.

Digital collections vary by museum; some museums have made their collections available digitally, with images and physical, contextual, and bibliographical information. Examples of contextual information about an object can be found in larger institutions, such as the Metropolitan Museum of Art (fig. 1). Other aspects of the collection allow the viewer to view the image on a larger scale and in greater detail, such as in the deYoung Museum in San Francisco (fig. 2). All digital collections researched allow the user to search for an object, with advanced search options to search for a work by artist, time, place, medium, etc. Many museums with digital collections allow the user to “share” the image via e-mail or to social media sites, such as Facebook or Twitter (fig 3).


37 Ibid.
Many museums that have libraries and research centers also present some of their content online, such as the Art Institute of Chicago (fig. 4). Susan Augustine, Head of Reader Services at the library, explained some of their libraries’ offerings: they subscribe to over 60 commercial databases, not limited to journal/article databases alone, but also image databases and art auction resources. These databases not only assist the scholar or researcher, but museum staff as well. Many of the resources can be accessed via the museum’s website, so those who wish to use the databases would not even have to visit the museum physically. Some of the information that can be accessed remotely is restricted to those who have a user name and password, but visitors can access the information at the library. Ms. Augustine also ascertains that the library wishes to be open to the public; that anyone can visit the museum within its operating hours and make use of their collections and databases.

Other museums, unfortunately, do not have as many resources available to them online; factors such as funding do not allow museums to fully expand their online offerings as much as they would like to. Such is the case with the Newark Museum; they maintain that not enough in their museum has been expanded online. Their website only contains brief narratives about their collection, with some static images, unable to view larger or zoom in on details. The museum’s library and archives do have web pages; however, they offer little information except what types of information one can expect to find at the library and archives (fig. 5). The library’s catalogue is also shared online with the Newark Public Library and the New Jersey Historical Society’s libraries (fig 6.).

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38 Augustine, Susan. Interview by the author. Phone interview. March 1, 2011.

39 Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.
Thus, one would assume that any in-depth research would have to be performed at the museum itself, rather than obtaining any information online. Again, other factors are in play here; it is not the desire of the museum to have few scholarly resources online; it is the lack of financial resources that prevent the digitization of the museum’s collection and research materials.\footnote{40}{Ibid.} \footnote{41}{Peniston, William. Interview by the author. E-mail interview. November 30, 2010.} \footnote{42}{Reilly, Bernard. \textit{Collections, Content, and the Web- Collections- Museum Collections}. Council on Library and Information Sciences, 2000, 45-46.}

Digital collections are able to greatly enhance scholarship. Through digital collections, scholars are able to process more records in a lesser amount of time had they been looking through physical records or objects. Digital collections take various forms: a museum can present its entire collection or selected works, and include contextual or related information. Most museums opt to present only selected portions of their collections for several reasons, such as intellectual property issues, lack of resources, or documentation issues. Digital collections have been instrumental in facilitating research at the museum.

Bernard Reilly states that there are several paths that museums can take in the future of their digital collections, such as the Selective Model, which presents selections from an institution’s collection. However, certain works would be exempt from these selections, such as works that would still encounter intellectual property issues, disturbing works, and "poorly documented" works. He states that these selections would be subject to change. This is the model that many museums already implement in their digital collections. The Collections Catalog Model would provide a large amount of
access to the broadest audience. This model, although ideal for the scholar, would be extremely costly, not only to implement, but also to maintain, and could raise a multitude of intellectual property issues. Finally, the Shared Holdings model would be more of a content-based model, collecting works from various museums that share a commonality, and presenting them like an exhibition catalog. This, according to the author, is also a very resource-intensive model, but resources and costs could be split among institutions.

One aspect of digital collections that concerns scholars is the concept of digital surrogates: digital representations of objects, articles, books, images, and other types of information that have been digitized. Creating digital surrogates also, in a way, preserves the work; the work or object will no longer have to be physically handled as much as an actual object, which, in the cases of very fragile and old artworks, is a benefit. Marty states that “...digital surrogates offer faster access to information, with more access points, faster searching and sorting, and the ability to compile and print lists quickly.” They also offer new levels of interaction between objects and users, such as infinite copying and transferring. Museums are also able to archive digital surrogates perhaps in a more cohesive manner than with their physical counterparts; for example, a work that cannot be classified into one particular grouping can now be listed in several as a digital surrogate. With regard to scholarship, Marty and the museum professionals

43 Ibid.


45 Cuccinello, Katharine. Interview by the author. E-mail interview. March 11, 2010.

consulted agree that although there is not a suitable alternative for a real, physical experience with an object or work of art, in many cases a digital representation can satisfy the scholar's needs. A digital surrogate of an original manuscript, book, or journal, however, might illicit a different response from the museum professional. The scholar in this case is concerned with the information contained in the volume, rather than the object itself. This may be where the attitude towards technology and scholarship in the museum differs from the attitude of technology and the object in the museum.

**Issues in Digital Collections**

There is a significant issue concerning digital collections: intellectual property. Without proper controls and protocols in place, any user would be able to download images and other information from a museum's digital collection and use it for their own purposes without referencing the museum. Some websites and image repositories, such as ArtStor, watermark their images to prohibit publication or for any other use. Not only are there intellectual property/copyright issues within a museum's collection, there are also copyright issues that can arise when publishing information digitally or reproducing the image for digital publication or uploading to an online database. Sharon Page notes that in doing this museums can create multiple layers of copyright; there is the original copyright of the work held by the person or entity that created it, and a new copyright that is created by the person who publishes or uploads the content. If the museum's digital collection is on some sort of removable media, such as a CD-ROM, there are several

47 Ibid., 3717.

48 Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.

rights to the entity; there are the rights to the content (the information, images, etc. owned by the museum), the customized software used to create the CD-ROM, the digital collection, and the finished product\(^{50}\). This also applies for online databases and databases already loaded onto computers, where the database itself constitutes rights.

Another issue that appears with museums’ digital content is that copyright laws are not multinational, even though the Internet is; what violates copyright laws in the United States may not violate copyright laws in another country\(^{51}\). This is something that must be noted if museums are considering integrated collections; if museums collaborate and integrate internationally, shared copyright and intellectual property laws must be followed. If there are existing copyrights to an artwork, object, book, etc., permission must be obtained from the owner before publishing on the Internet. However, a preexisting permission to publish may not include information or give permission to digitize or publish on the Internet, as, as the agreement may have been enacted prior to the widespread advent of the Internet\(^{52}\). Examples of this were cited by Carolyn Carr, Deputy Director and Chief Curator at the National Portrait Gallery, during an interview\(^{53}\). Also, identifying the original owner of the copyright may prove difficult, especially in the case of old photographs\(^{54}\). Museums also may grant permission to digitize the work even though the copyright may have expired. Registered and unregistered trademarks are

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\(^{52}\) Ibid., 84.

\(^{53}\) Carr, Carolyn. Interview by the author. Phone interview. March 1, 2011.

another issue besides copyright that museums must be concerned with. These must also
be approved by their owners prior to digitization or digital publishing on the Internet.

Situations involving orphan works are also something that museums can face in
their effort to digitize their collections and make content available on the Internet. An
orphan work is a work of art in which the original copyright owner cannot be located to
obtain permission for its use. Legislation states that museums cannot be held completely
liable if they have made a “diligent, reasonable and appropriate effort” to find and contact
the supposed copyright holder for permission, but there are problems in trying to
determine what constitutes a “diligent, reasonable and appropriate effort”, in that
museums may not have the resources to conduct what lawmakers might deem
acceptable55.

There are exceptions to copyright law for libraries and archives, as these
institutions exist to preserve and protect information. Libraries’ and archives’ material
may be reproduced in order to preserve it. A study group in 2005 examined current
copyright exceptions that are granted to archives and libraries. They published a report in
2008 with their findings and suggestions to amend current copyright law. Their
suggestions included the extension of these exceptions to museums, as well as protection
against copyright infringement lawsuits (within reason). This protection is already
granted to libraries and archives56. Museums are often concerned with the preservation of

55 Techweb, "Copyright Issues Become Cloudy When Content Owners Can't Be Found." TechnWeb 1
May 2, 2009).

56 Cardinale, Philip, and Michael J. Remington. "Expansion of Copyright Infringement Protection Proposed
its materials. Sometimes, in order to preserve an object, a reproduction must be made (such as the case with old photographs or documents). Intellectual property laws may prohibit the reproduction of works by a museum, whereas a library or archives department might be able to. These matters prevent museums from carrying out portions of their missions57.

Copyright infringement with regard to museums' content on the web can happen in a number of ways, with one of the most damaging being the illegal downloading and publication of the images without permission. There are also other ways users can violate museums' digital copyrights and intellectual property. Anna Booy states that “of particular significance in the electronic environment is the moral right to ‘derogatory’ treatment. Very little on the Internet can be considered sacred and it is possible for most images to be manipulated to their detriment using electronic programs.”58 Another concern is false metatagging, in which one can put false or other misleading information behind or deep within web pages in order to attract the attention of search engines and generate revenue for the user who falsely metatagged the image. This is done through two methods, called deep linking and framing. Deep linking is taking the practice of hyperlinking (linking to another portion of a website or another outside page) and using it to link to other pages, thus by-passing the important areas of the website, including any page that features a copyright warning, any page restricted to the general public, or any page that could not be accessed unless some type or purchase was made. Framing is the


practice of accessing another page through a frame on the original site, allowing one to think that the content in the frame is from the original site, when in fact it is not\textsuperscript{59}.

All of the solutions to rectify any intellectual property issues in the museum depend on one thing: the resources of the museums. Some museums have opted to only include portions of their collections in order to reduce infringement, such as the Metropolitan Museum of Art and the Museum of Modern Art. Other museums such as the San Diego Museum of Art have opted to skip portions of their collection all together in an effort to avoid any copyright issues.\textsuperscript{60} The National Portrait Gallery also follows the same set of rules in producing images for online use.\textsuperscript{61} Page states that what must happen in order for the museums to retain their intellectual property rights and be in accordance with intellectual property laws is to take a more commercial stance when dealing with copyright\textsuperscript{62}. One example of how museums do this is through the use of charging for permission to the rights to their images and licensing. Although museums are typically nonprofit institutions, they must have a revenue source besides donations to keep operating. This is done through permissions granted to individuals, other institutions, or scholars for use of their images. A fee is typically assessed for these images. However, adopting a more commercial attitude unfortunately undermines most museums’ mission statements of being an institution of preservation and education, and not for directly generating revenue.

\textsuperscript{59} Ibid.

\textsuperscript{60} Reilly, Bernard. \textit{Collections, Content, and the Web- Collections- Museum Collections}. Council on Library and Information Sciences, 2000, 46.

\textsuperscript{61} Carr, Carolyn. Interview by the author. Phone interview. March 1, 2011.

Another solution can be found in the way the museum presents its digital content on the Internet. Typically, when museums publish their images online, they are smaller, low-resolution images. These images may also be watermarked in an effort to stop downloading and copying\(^6^3\). Viewing of high-resolution images can then only be accessed through a purchased subscription, but again, the image can only be viewed, not downloaded. ArtStor is an application that fits these criteria: it can be used by scholars, educators, students, educational institutions, and individuals. There are fee-based subscriptions granted, with the fee differing for the type of subscription purchased. Any image that is downloaded from ArtStor is again, smaller, and watermarked, rendering it virtually useless for publication.

In order for museums as a whole to be able to combat intellectual property issues that may arise as a result of digital collections, they must develop some type of intellectual property and digital rights management policy. This policy must be comprehensive enough to include all possible versions of a work, both digital and non-digital. An issue that can arise is that larger museums have the resources to adhere to these policies, while smaller museums may not as capable, and as a result may not be able to offer more digitally.

The question remains: how do museums take advantage of the ever-growing technologies available to them in order to sustain themselves without having to devote a large portion of their resources to retain a staff (or devote a large portion of the existing staffs' time) in order to remain compliant with intellectual property laws concerning

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\(^6^3\) Bann, Louisa, Interview by the author. Phone interview. April 22, 2009.
digital content? Museums will have to make a difficult decision to either cut resources from other areas if they wish to remain in accordance with current intellectual property and copyright laws and to protect their digital content, or risk not having digital content available to the public. This is the biggest reason, besides lack of resources, why museums do not present all of their materials online to the general public.

**Other Technologies Available for the Scholar**

Other technologies that are available to the museum scholar are not necessarily offered by the museum itself. When speaking about technology and the Internet in general, Google is one of the entities that come to mind. Google has created many applications to enhance one’s experience on the Internet. What once started out as a simple search engine branched out into many applications in different areas, including applications for the student and scholar. Presently, they have contributed three applications directly related to scholarship: Google Books, Google Scholar (beta), and most recently, Google Art Project.

Google Books began in 2004 when five libraries agreed to have their entire collections digitized by Google (fig. 7). Google Books allows users to search for information within the search engine that is contained in these and other digitized collections. Google Books allows the user to search inside a book and retrieve pertinent information, rather than have to search through entire volumes to derive only a small piece of information. However, Google Books aroused a great deal of controversy

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surrounding copyright issues, because publishers would have had to opt out of their books being searchable, while copyright would prohibit Google from scanning the books and other works. Many seem to be critical of Google Books. Geoffrey Nunberg indicates that there are large gaps, inconsistencies, and errors in the metadata within Google Books. Google claims that the errors and inconsistencies lie with the publishers and "keepers" of the data. It is unfortunate that Google Books is not as useful to scholars as it intends to be; more comprehensive agreements with more publishers and libraries, as well as some re-tooling of the formulas that make up the database may be able to make Google Books a more useful tool for scholars.

Google Scholar, on the other hand, seems to be a more valuable tool for the scholar. Google Scholar "crawls" through many databases, including preprint databases, libraries, and government databases of articles, all for public use and access (fig. 8). Google Scholar is different from other types of databases because it searches the full text of the article, rather than the bibliography, abstract, or key words (as defined by the author or publisher), but it does have its limitations to searching. In a case study by Peter Jacso, not all issues of a journal may be indexed in Google Scholar. He cites an example in which all of a journal’s issues were not indexed on Google Scholar, but were available on the journal’s website for viewing. Jacso also states that Google Scholar

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68 Ibid., 210.
keeps the beta tag on its home page as a “shield”, to protect itself from omitting large amounts of content and errors, even though the application has been available for over five years. Google Scholar seems to be an initial positive course of action in providing a comprehensive tool for scholars, but more action needs to be taken in order to be a more useful application.

One of the most recent additions to Google is Google Art Project, launched in early 2011 (fig. 9). Google Art Project is a way for users to virtually “visit” many museums throughout the world. Museums such as The Museum of Modern Art, The Hermitage Museum, and the Uffizi Gallery are among the museums featured in this application. Users can explore the museums in two ways: the first by “walking” through the galleries, replicating an actual visit to the museum. The technology used to create this experience is the same as Google Maps’ street view. The other manner of viewing works is very similar to viewing works on a museum’s collection webpage: by searching or browsing for a particular work. The work then appears with information about the work in a sidebar. What sets Google Art Project apart from many other collection databases is the ability to zoom in on details on a very large scale. Morgenstern states that the works were scanned at a resolution of seven billion pixels. This is excellent for researchers who need to view this level of detail in a work, and more often than not, would not be able to get that close to an object when viewing it in a gallery. It does not,
however, provide enough contextual and bibliographical information about an object for the scholar to derive enough information for their work, but it is an excellent visual tool.

As is the case with museum collection databases, Google Art Project only featured selected works from the museums. This is not necessarily Google’s fault, and not necessarily the museum’s either; copyright issues may prohibit museums from presenting works in this manner. Although it would be ideal if all museums followed this structure for their digital collections, it is not feasible for museums of all sizes and types at this time, because of resource, staff, time, and copyright issues.

Google applications appear to be a step in the right direction in providing extremely easy access and very pertinent information to scholars and researchers. Through Google Books, a scholar would be able to search through books much faster than on their own in the library, as well as access books that they are not able to acquire easily. Google Scholar provides articles in various forms (such as preprints) without a subscription, something that professional scholars and researchers would have to typically visit an institution to access. Google Art project provides incredibly detailed, high-resolution images for the scholar to view without having to visit the work in person, or in some cases, would not be able to see as closely even when viewing the artwork in person. However, as mentioned, there are still some issues with these applications that prevent them from being a “one-stop shop” for scholars.
Museum Wikis

Another type of technology beneficial to the scholar and the museum is the wiki. Wikis allow scholars and museums to collaborate as well as with each other. Wikis by definition are web pages that are able to be edited by any visitor. Wikis first appeared in the mid-1990s. They allow scholars to collaborate and easily discuss topics with other scholars in an open format. Editing a wiki can be as easy as writing an e-mail; there is no software to navigate and no codes to learn. The wiki, however, cannot be utilized as an objective research tool, because the ideas, opinions, and views of the contributors are apparent in the wiki, but they are outstanding resources for ideas and allow scholars to interact with each other. Several museums have wikis, including The Brooklyn Museum (http://www.brooklynmuseum.org/eascfa/dinner_party/about_wiki.php) (fig 10) Museums Wiki (http://museums.wikia.com/wiki/MuseumsWiki) (fig. 11) and the Newark Museum (http://museums.wikia.com/wiki/Newark_Museum_Wiki) (Fig. 12), as well as several others. Wikis as a scholarship tool alone are not the most reliable because of their subjective nature, but they are incredible ways for scholars to communicate and collaborate on projects. Scholarship has changed in that respect; scholars no longer have to wait for communication from either an institution or with another scholar. The pace of collaborative projects has quickened immensely; through wikis, scholars and museums are able to collaborate in “real time” and accomplish a great deal.
The Relationship between the Scholar and the Museum

Much of the literature consulted for this paper does not discuss the relationship between the scholar and the museum, nor is there any literature devoted solely to the concept of museum technology and how it affects the scholar. Much of the literature devoted to the relationship between the museum and any party is between the museum and the visitor (which the scholar is in a sense, a part of, but requires more resources than the museum offers superficially). Since the visitor makes up the broader audience that comes to the museum, more emphasis would be placed on researching what the visitor’s demands and expectations are. The scholar does utilize more of the museums’ resources, however, and the end result of their work is more of a benefit to the museum. The literature consulted cites numerous visitor studies in which the visitor utilizes all of the technology the museum offers to them, which is not unlike the behavior of the scholar. Paul Marty states that the museum as an institution is in need of analysis by the field of information science, based among the amount of works published on the changing needs and demands of the museum professional, the museum visitor, and the museum itself.72 He states that the academic user of such information systems would need very little in the way of guidance, with access to search for their own material, but with suggestions for further research and other materials. Marty’s article and research indicate that new technologies in the museum allow for more collaboration among museum professionals, scholars, and anyone else who is in contact with the museum, which is contrary to the idea that technologies would make anyone working with electronic data in the museum

more independent, since they would be able to access the information on their own. Marty speaks of systems that are integrated, perhaps with other institutions, so that the scholar can easily search for relevant material and receive suggestions for related material, rather than culling a large amount of information that the scholar would need then to weed through in order to gain relevant information\textsuperscript{73} (Marty 2008).

The museum and the scholar relationship is synergetic: the scholar needs the museum for information and for their collections, and the museum needs the scholar to continue publishing works about its collections in order to remain viable in the academic world. Access to information is of utmost importance for those who wish to utilize a museum's offerings to researchers and scholars. One can argue that there should be access to any and all of a museum's information, wherever, whenever, and by whomever. Olivia Frost points out that the experience of gaining this information is not the same as a visit to the museum or collaboration with a museum professional; users may lose the "context and personalization of the assistance of a museum professional or a librarian."\textsuperscript{74} This may prove true among today's scholars, but as younger generations (ones who have not grown up with the assistance of others in their research), replace today's scholars, that reliance on an intermediary will become less and less and more emphasis will be placed on access to museums' information from more digital sources.


Museum professionals\textsuperscript{75}\textsuperscript{76} agree that the relationship between the scholar and the museum is mutually beneficial; it is not that one cannot exist without the other, but that museums provide the material, from which scholars derive their research and generate new information and knowledge; that, in turn, helps the museum in its knowledge of its collections. Museums also possess a public service component. This public service component means that they must serve their audiences, and that also includes scholars who wish to research at their respective institutions\textsuperscript{77}.

**Perspectives from Museum Professionals**

Several questions need to be answered in order to come to a conclusion about the museum and the scholar. Firstly, it needs to be determined if museum professionals feel that technology assists them in being a center of research for the scholar, and if technology enhances the scholar's experience in the museum. If a museum does offer information digitally, do scholars utilize all of the resources that the museum offers to them? Do museum professionals feel that scholars would utilize their institution more if they had more available digitally? Whether or not there has been an increase in requests by the scholar or if scholars have become more specific or demanding in their requests is also something to question, because it would indicate if scholars are able to accomplish more as a result of more information being made available to them initially. Because of so much information becoming available digitally, it would be worthwhile to also ask

\textsuperscript{75} Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.

\textsuperscript{76} Augustine, Susan. Interview by the author. Phone interview. March 1, 2011.

\textsuperscript{77} Grinols, Susan. Interview by the author. E-mail interview. February 14, 2011.
them if they have encountered intellectual property issues as a result of this information being digitized. Finally, asking museum professionals directly about the relationship they have with the scholar, what they think of the future of the relationship, as well as the future of their institution with regard to technology and emerging scholars, will be critical to determining the future course of scholarship in the museum.

To answer these questions, many museum professionals and museum scholars throughout the United States were contacted directly by phone and e-mail. Although over thirty museums were contacted, only eleven interviews were conducted, mainly through e-mail. Of those eleven, nine were selected to be included in this thesis, because the information in the remaining interviews was redundant, or because the information obtained in the interview was not enough to make a definitive conclusion about the topics addressed during the interview. The interviews were conducted either on the phone or through e-mail, and the same questions mentioned previously were asked during the interviews, as well as other general questions to better understand the size of the museum and any factors that inhibit any digitization efforts. After the interviews, it was determined that more data from a broader range of sources was needed. Therefore, an informal survey was conducted online (https://www.surveymonkey.com/s/museumtechandscholarship) and distributed through the American Association of Museums Media and Technology Facebook page (fig. 13), as well as distributed through the Museum-L listserv. The same questions used during the interview were included in the survey. Twenty-five responses were received over the course of a month.
Many museum professionals consulted for interviews and the survey were also scholars themselves, which lent itself well to the research, as they were able to answer questions both as a museum professional and a scholar. The initial goal was to find scholars that also studied at the same institution, but it proved too difficult to find scholars that fit the criteria of researching at a particular institution and was willing to share their experiences. Perhaps they did not respond out of fear of changing the dynamic of the relationship between themselves and the institution they worked with, which is crucial if the scholar’s research interests are located at that institution. Through the course of research, students, curators, education staff, libraries and archives staff, rights and reproductions staff, and other types of museum professionals came forward to share their experiences and opinions. Many of the answers to the questions asked were the same: they all agree that technology definitely enhances the scholar’s research experience in the museum.

Survey Results

The survey indicated the following about museums, museum professionals, and scholars: 88% of respondents stated that technology enhances the scholar’s research experience at the museum, while 12% felt that it somewhat enhanced the experience at the museum. In interviews with various museum professionals, databases were among the most prevalent offering by museums to scholarship, with 66% of participating museum professionals citing them as a tool they provide for scholars. Portions of those databases

78 Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.
79 Freeman, Kay Olson. Interview by the author. E-mail interview. March 14, 2010.
80 Soeffing, D. Albert. Interview by the author. E-mail interview. March 14, 2010.
are commonly found on the museum’s website, accessible to the public. It was determined that 36% of participants stated that there has been an increase in requests by the scholar, while 24% indicated that there has not been a change in the volume of requests they receive. It was discovered that museum professionals are equally split about scholars having more specific demands for information because of technologies provided by the institution. When asked about more specific queries by the scholar, 44% indicated they have noticed more specific requests, while 28% responded that they have not encountered a change in the types of requests by scholars. The remaining 28% did not have an answer or felt that the question did not apply to them.

To better gain an understanding on what types of museum professionals were responding to the survey, participants were asked if they had decision-making powers in implementing new technologies. It was determined that more than a third of participants (44%) did have decision-making authority in their institutions. Approximately a third (32%) did not have any authority to make any decisions regarding the implementation of technology. Regarding intellectual property issues, nearly half of those surveyed (40%) indicated that they have encountered intellectual property issues because of their institution’s information becoming digitized. The majority of museum professionals who responded (76%) feel that their institution would be better utilized by scholars if more information were made available digitally (although not indicated if this digital information was provided in-house or through the institution’s website). For those institutions that do have content available digitally, approximately half (52%) of museum professionals surveyed feel that scholars do not make full use of their offerings. Below
are some quotes taken from the survey, which provide excellent insight into the point of view of current museum professionals:

**On the future of the relationship between the scholar and the museum:**

"I think technology will improve scholars' access to information. When museums link database with other museums, for example. Also will improve museum's access to scholars' published works. Technology enables museums to engage our audiences (on and off-site) by providing new ways of accessing the collections, and new ways of getting scholarly content in front of our audiences."

"Probably, down the road, scholars will not have to visit museums, except in complex cases. But, probably by then, complex research will be necessary in order to be on the cutting edge, so "real" in-person interaction will be necessary. Sort of a paradox.

**On the current relationship between the scholar and the museum:**

"Current relationship is that museum's serve scholars by providing access to materials, and scholars serve the museum by advancing the study of art history. I think technology helps scholars by making it possible to have access to the entire museum collection, and related materials, without having to rely on staff."

**On what museums can do to make themselves more accessible to future generations of scholars:**

"Offer more information available digitally, as I believe that many of the younger tech savvy scholars may not be as interested or as able to dig through drawers of artifacts and archives full of hard copies as was the norm 20 years ago."

"Frankly, I see more young, tech-savvy individuals who want to take photos of themselves next to art works rather than more scholarly applications. Museums should make 100% of their collections available on line with images and catalogue information, but this is difficult on two levels. Few have the funds and staff to do this, and it would take a long time for major museums with hundreds of thousands of objects in their collections to accomplish this."

"Museums need to give more attention to the digitizing of their collections and building digital research tools—but on the flipside, corporations need to see this as something important to support, because that's where the money has to come from. I also think it is the young scholars who need to accept the limits of the field they have chosen, and to deal with the realities of a world where profit is not the driving motive, and thus progress into modernization is slower."
On museums and technology in general:

"In general, I feel that museums are a little behind the curve in implementing and exploiting the most current trends in technology, but that is improving, as the culture of museum staffing in general evolves (to include more and more staff who are conversant and comfortable with tech aspects, and whom bring with them different expectations about what is/should/will be made available)."

"...but it is part of the duty of a museum who holds objects in the public trust to provide access. If for some reason there is a limited access to objects for scholars and the only way they can research and study an object is through technology then I think it is imperative that that service be provided. I don't think appear is the correct word. It becomes an addition to the access already provided, but cannot take the place of seeing an object first hand."

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**Does Technology Enhance the Scholar's Experience in the Museum?**

- **yes, definitely**: 88%
- **somewhat**: 12%
Has there been a rise in inquiries/requests as a result of digital technologies for research?

- yes 40%
- no 36%
- no answer/not applicable 24%

Are scholars more specific or demanding in their requests as a result of technology?

- yes 28%
- no 28%
- no answer/not applicable 44%
Do you have decision-making power in implementing new technologies?

- yes
- no
- no answer/not applicable

Have you encountered any intellectual property issues as a result of digital images on your website?

- yes
- no
- no answer/not applicable
Do you feel your institution would be utilized more for research if you offered more digital technologies for research?

- yes 0%
- no 24%
- no answer/not applicable 76%

Do you think scholars make full use of the technologies available to them?

- yes 52%
- no 36%
- no answer/not applicable 12%
Limitations to Research

There were certain limitations to the interviews and the survey. Although museum professionals from outside of the United States were contacted, none of them responded; therefore, all of the interviewees are from museums in the United States. During the interviews, much of the information received was similar; this was both a benefit and a hindrance, because it reinforced the thought that museum professionals are thinking alike, but it also did not provide any new perspectives or insight into the questions asked during the interview. Many of the interviewees were unable to definitively answer the question of what implications there were for the future of the relationship between the scholar and the museum. Future research may include more interviews at museums world-wide. Other suggestions for further research may include more detailed questions, and more developed questions regarding the relationship between the scholar and the museum.

Some participants in the survey noted that they were confused by some of the questions. Future research could include re-wording the questions to clarify any areas that were cited as being confusing. One respondent indicated that the survey was too long; perhaps the length of the survey could be adjusted for different audiences in order to obtain more specific data from different types of museum professionals. Skipped questions was the biggest limitation in the course of research; had there been less skipped questions, more data could have been collected pertaining to the museum and the museum professional. A new survey could be designed to eliminate the option to skip a question if it was determined that skipping a question would be detrimental to the data.
Implications for the future

What are some of the implications for the future of digital scholarship? Concerning scholarship in general, Anderson believes that if and when scholarly works are uploaded into a database, they lose their identity and become more of a “sum of their parts” rather than an entire work. In essence, this already occurs during the scholarship process, with advanced techniques in today’s search engines and databases; one could easily search for phrases or words in a particular work, without ever fully understanding the context. Examples of this can be found in Google Books and Google Scholar, as previously mentioned.

The future of scholarship in the museum will include more developed digital collections by the museum, so that any user will be able to access not only a digital representation of an object, but information as well. Applications for scholars to collaborate and communicate will most likely be pursued, as seen already by the development of wikis, blogs, and other applications for museum scholars. The future of museum scholarship may also see the beginning of integrated systems between institutions, which can be very beneficial to the scholar.

Marty states that the museum of the future will be a highly accessible institution, where “students, teachers, academics, scholars, and members of the general public, armed with only a computer and an Internet connection, will be able to browse the collections of

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the museum world-wide, including those artifacts which are currently not on display”82. Integrated systems between museums would allow for more in-depth searching and could provide more related results, not limited to the constraints of one database83. More could definitely be accomplished by the scholar if they had access to integrated systems. The concept of integrated systems also seems to be on the minds of both scholars and museum professionals; several museum professionals consulted during interviews state that integrated museum systems are something that museums will have to undertake in order to provide more to those who research (and also what scholars would want to see in the future of research at the museum).

Museums must incorporate standards and a type of structure that allows information to be presented in a similar manner, so that scholars can effectively utilize all of the digital resources available at all museums that provide them84. The most important aspect of a good infrastructure for digital scholarship is that information goes into the library and allows others to retrieve the same information and ideas every time the information is accessed, with full information on how the information was received. New technology should only change the method and speed of retrieval, and not the content, which is the most important factor in the research process.

Many museum professionals who responded to the survey responded very similarly when asked about any changes that technology has made in the relationship

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between the museum and the scholar. One of the most prolific ways in which scholarship is transforming is in communication and collaboration. If scholarship is fundamentally changing nowhere else, it is definitely changing in that respect. Perhaps this indicates that there was a need for more communication and a desire for more collaboration among scholars, and that need was filled by technology. E-mail is the simplest application that scholars and museum professionals feel is the most beneficial to their work. Other methods of communication and collaboration are in wikis, blogs, and e-mail list-servs.

Museum professionals and students agree that technology has unquestionably facilitated research at the museum: it has provided wider and better quality access to museums' information, which is something that museums need to do in order to remain pertinent to 21st century society, where information is abundant. In order to compete with other types of research tools (such as Google Scholar), museums can only benefit by presenting more information digitally. With the correct tools and implementation techniques, they can be successful in presenting research materials online. Several museum professionals agree that technology has changed the way culture is recorded; that there is a break between old and new scholarship. This is not necessarily a negative occurrence; as one museum professional states, obscure and rare information that a museum digitized is now available to the scholar, who in turn, can produce original research that can revolutionize the body of research on one particular topic. Conversely, another museum professional stated that young scholars have a narrow view of the world of scholarship; that "if it is not on the web, it is not important." Some, on the other

85 Ibid.
86 Ibid.
hand, do not believe that digital technologies will change anything about scholarship in general; that only the "access point has changed" from the physical to the digital\textsuperscript{87}. Ulysses Dietz from the Newark Museum says the following about the relationship between the museum and the scholar: "...the relationship between the serious scholar and the museum has not changed at all, except in execution, so to speak. The relationship between casual, hobby or amateur scholars has changed more, because we are more accessible."\textsuperscript{88}

**Conclusions**

Williams states that there is still a lack of a central system for museums to refer to when working with technology.\textsuperscript{89} As other authors and museum professionals have noted, there is a lack of standards and best practices when it comes to museum computing and digitization of their collections. There are many different types and sizes of museums, each with their own unique sets of advantages and challenges, but there must be some sort of central, basic set of standards for museums to follow, regardless of resources available or institution size. There is also a lack of museum-specific software for this purpose, and although there are many applications available to museums today, it is not a "one size fits all" approach.\textsuperscript{90} There needs to be one or more organizations that have to develop these guidelines, implement them, and enforce them. The International Council

\textsuperscript{87} Dietz, Ulysses. Interview by the author. E-mail interview. March 12, 2010.

\textsuperscript{88} Ibid.


\textsuperscript{90} Ibid., 20.
of Museums (ICOM) and the American Association of Museums (AAM) both provide guidelines and best practices on a range of topics for museums. The two organizations should collaborate on how to provide guidelines to digitization that are specific enough so that museums would be able to provide technology, while taking into account that museums vary in size and resources.

The literature consulted for this paper also discusses inconsistencies within the standards for digitizing a museum’s information; that there are no commonly adapted standards throughout the widespread museum community. Although museums may want to implement new technologies to assist scholars and further scholarship, there are several external factors that contribute to a museum's adaptation of certain technologies. Economic and funding factors are prominent elements in deciding to implement certain technologies, subscribe to digital journals, etc. Social factors are also important; if the scholarly community at large is not receptive to a certain technology or does not seem to be interested, the museum would naturally be cautious to adopt it. In several interviews with museum professionals, my thoughts on scholarship were reinforced; scholarship itself has not fundamentally changed as of yet, but all steps of the process have been enhanced. The largest improvement and change is in the collaboration and communication between scholars, and communication between the scholar and the museum. Museums are able to provide wider access to scholars, and scholars are able to access more information through the museum, either through the museum’s offerings on

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however, there are several points to consider. Firstly, not all museums can share
in the attitude of being all-accessible, due to social and economic factors that greatly
inhibit any digitization projects. It is not necessarily the attitude of the individual museum
professionals that make up this outlook, but rather the museum as an institution. The
attitude of some museum professionals consulted was defeatist; this is unfortunate, as
there is so much to take advantage of, but little resources to utilize in order to achieve
their goals. It is a continuing problem that plagues museums in reaching their full
potential. A quote from the survey conducted reads:

"There are 100's of different types, sizes, and levels of museums. Some are incredibly
tech-savvy while others are still struggling to get databases set up. This really depends on
the mission of the institution, its budget, and the decisions of the Board of Directors. 'No
foreign policy - no matter how ingenious - has any chance of success if it is born in the
minds of a few and carried in the hearts of none.' - Henry A. Kissinger. This can be
applied to any institutional vision."

As many museum professionals and authors have noted, nothing replaces the
experience one has with an object or artifact, no matter the audience. Concepts like
digital surrogates and even the most advanced digital collections can provide scholars
with physical and visual information, but lack in extensive bibliographical and contextual
information for objects. Museums, in the past, were institutions that scholars visited
exclusively to obtain material for their research, and to spend time with the objects or
collections they were currently researching. With the advent of digital collections and
databases available on the Internet with high-resolution and sometimes 3-D images, scholars do not necessarily have to visit the museum to obtain the information they need. Technology continues to enhance current scholarship; although not completely transformed as of yet, as today’s young scholars continue to take advantage of more and more museum technology, scholarship will transform into a largely digital concept.
Appendix A: Figures

Figure 1. Example of the collection database at the Metropolitan Museum of Art, New York, showing some of the contextual information that accompanies its images.

(http://www.metmuseum.org/works_of_art/collection_database/medieval_art/plaque_with_agnus_dei_on_a_cross_between_emblems_of_the_four_evangelists/objectview.aspx?pa...
Figure 2. Example of zoom detail at the deYoung Museum, San Francisco.

(http://deyoung.famsf.org/deyoung/collections)
Figure 3. A page from the Collections section of the Chicago Institute of Art, illustrating the ability for the user to “share” the image and information via social media (including e-mail).

(http://www.artic.edu/aic/collections/artwork/14655?search_id=7)
Figure 4. The database webpage within the library website at the Art Institute of Chicago.  
(http://www.artic.edu/aic/libraries/research/findarticles/humanities.html)
**NEWARK MUSEUM**

always different.

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<table>
<thead>
<tr>
<th>Exhibitions</th>
<th>Programs</th>
<th>Education</th>
<th>Curatorial</th>
<th>Administration</th>
</tr>
</thead>
</table>

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**About the Archives**

The purpose of the Archives is to collect, preserve, and organize The Newark Museum's records of historical value. Materials document exhibitions of art, science, and culture; public and educational programs; as well as administrative activities. The earliest records date from 1909 and continue through the present, consisting of over 2,500 linear feet of paper records, 26,000 documentary photographs, over 200 published articles written by staff members, and hundreds of video and audio recordings. Located within The Newark Museum's Library, the Archives provide reference services to hundreds of researchers each year.

**Using the Collections**

Finding aids describe the organization and content of the processed collections and are available in the Archives. This page is updated as archival collections are arranged and described. To view a description of currently available materials, select a records group from one of the five menu tabs at the top of this page.

The Archives is open to researchers by appointment only. Monday through Friday, 9:00 a.m. to 5:00 p.m. To schedule a visit or make an inquiry, please contact the Archivist.

**Contact**

Archivist: Jeffrey V. Moy
Phone: 973-596-6622
Fax: 973-642-0459
E-mail: jmoy@newarkmuseum.org

Address: The Newark Museum
Archives
49 Washington Street
Newark, NJ 07102

Public Hours: By Appointment Only
Monday—Friday, 9:00 a.m. - 5:00 p.m.

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Figure 5. The Newark Museum’s Archives webpage.

([http://www.newarkmuseum.org/archive/index.asp](http://www.newarkmuseum.org/archive/index.asp))
Basic Search

Step 1. Choose the index in which you wish to search

Step 2. Enter the name, word, phrase, or number for which you wish to search:

Step 3. If you wish to limit your search to items at a particular library or branch, or if you wish to exclude items in the U.S. Documents Depository collection, use the menu below:

All Libraries Represented in Catalog

Step 4. Submit your search.

HELP: Links below will lead you to suggestions about particular kinds of searches.

*Author • Title • Subject • Dewey Call Number • Journal Title
*Government document number • Fiction Call Number
*Standard Number (ISBN, ISSN, Music number)
*Searching for items in a particular language

To find series titles and words or names in contents notes as well as partly-forgotten names or titles, perform a Key Word Search

Figure 6. The library collection search of the Newark Museum Library.

(http://catalog.npl.org/search)
Figure 7. Google Books homepage.

(http://www.books.google.com)
Figure 8. Google Scholar’s home page.

(http://scholar.google.com)
Figure 9. Google Art Project home page.

(http://www.googleartproject.com/)
The objective of this project is to provide the most up-to-date academic findings about the 1,038 women represented in *The Dinner Party* by Judy Chicago. To this end, we have developed this database as a wiki to allow scholars to add and/or edit content. This wiki is an effective, easy-to-use tool for collaborative authoring, and a means of facilitating accessible and continuous online dialogue about these women's contributions to history.

If you are a scholar who would like to contribute to the entries that constitute *The Dinner Party* Wiki, please send an email to dice.wiki@brooklynmuseum.org.

Figure 10. The Brooklyn Museum Wiki.

([http://www.brooklynmuseum.org/eascfa/dinner_party/about_wiki.php](http://www.brooklynmuseum.org/eascfa/dinner_party/about_wiki.php))
Figure 11. Museums Wiki.

(http://museums.wikia.com/wiki/MuseumsWiki)
Figure 12. The Newark Museum Wiki.

(http://museums.wikia.com/wiki/Newark_Museum_Wiki)
Mary Perehinec-Germano, a grad student at Montclair State University Museum Management, is collecting data for her thesis, which concerns the role of technology in museum scholarship. She is studying the relationship between the scholar & the museum, & how technology has enhanced or transformed that relationship. She is looking for feedback from museum professionals, scholars, &/or students, in any type/size of org.

SURVEY: Museum Technology and Scholarship
www.surveymonkey.com

Figure 13. The survey published on the American Association of Museum’s Media and Technology Facebook page.

(http://www.facebook.com/MediaandTechnology)
Appendix B: Survey

### Do you feel that technology can help the scholar or enhance the scholarly experience in the museum setting?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, definitely</td>
<td>88.0%</td>
<td>22</td>
</tr>
<tr>
<td>Somewhat</td>
<td>12.0%</td>
<td>3</td>
</tr>
<tr>
<td>No, not at all</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**answered question**: 25  
**skipped question**: 0

### What types of technology do you offer to scholars? (e.g. collection databases, image databases, libraries, digital libraries, online journal subscriptions, etc.)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

**answered question**: 25  
**skipped question**: 0

### Do you feel that scholars are more demanding in terms of the content of their requests? If your institution has implemented changes to ease the process of scholarly requests, please explain below.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

**answered question**: 25  
**skipped question**: 0
Do you have any decision-making power in implementing new technology at your institution?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>57.9%</td>
<td>11</td>
</tr>
<tr>
<td>No</td>
<td>42.1%</td>
<td>8</td>
</tr>
</tbody>
</table>

*answered question 19*

*skipped question 6*

If yes to previous question, what factors led you to implement these new technologies? (Please answer "n/a" if this question does not pertain to you).

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

*answered question 12*

*skipped question 13*

Have you encountered any intellectual property issues as a result of the use of images on your website or the use of an online collection database?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>55.6%</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>44.4%</td>
<td>8</td>
</tr>
</tbody>
</table>

*answered question 18*

*skipped question 7*

Do you feel that your institution would be utilized more by scholars if you provided more digital resources for them?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100.0%</td>
<td>19</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

*answered question 19*

*skipped question 6*
Have you seen a rise in requests by scholars for images to be used in publication as a result of online databases or digital finding aids?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>60.0%</td>
<td>9</td>
</tr>
<tr>
<td>No</td>
<td>40.0%</td>
<td>6</td>
</tr>
</tbody>
</table>

answered question 15  
skipped question 10

How many scholarly requests do you receive in a given year? What is the process to obtain access to your offerings?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

answered question 19  
skipped question 6

Does your institution have any plans to implement technology useful to the scholar? Why or why not?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

answered question 18  
skipped question 7

How do you feel about the museum's (either your institution or in general) accessibility to scholars? Do you feel that technology would make the museum appear more accessible to the scholar?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

answered question 20  
skipped question 5
What is your perception of the relationship between the museum and the scholar? How do you feel the scholar and the museum benefit (or do not benefit) from each other?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>17</td>
</tr>
<tr>
<td>skipped question</td>
<td>8</td>
</tr>
</tbody>
</table>

Do you feel that technology has changed or transformed the relationship between the museum and the scholar? In what ways?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>17</td>
</tr>
<tr>
<td>skipped question</td>
<td>8</td>
</tr>
</tbody>
</table>

What future implications do you think there are for technology in the museum?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>17</td>
</tr>
<tr>
<td>skipped question</td>
<td>8</td>
</tr>
</tbody>
</table>

Do you think scholars make full use of the offerings at your institution?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>18.8%</td>
<td>3</td>
</tr>
<tr>
<td>No</td>
<td>81.3%</td>
<td>13</td>
</tr>
</tbody>
</table>

If answering "yes" to this question, please specify.

<table>
<thead>
<tr>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
</tr>
</tbody>
</table>
If you yourself conduct research, do you frequently use digital technologies in your research?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>14</td>
</tr>
<tr>
<td>skipped question</td>
<td>11</td>
</tr>
</tbody>
</table>

Do you think you could accomplish more in your research if more content was delivered digitally?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100.0%</td>
<td>14</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Do you think museums would benefit by making themselves more technology-friendly?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>16</td>
</tr>
<tr>
<td>skipped question</td>
<td>9</td>
</tr>
</tbody>
</table>

Do you feel that information available digitally changes in the relationship in which culture is recorded (i.e. there are no correlations between old and new scholarship)?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>15</td>
</tr>
<tr>
<td>skipped question</td>
<td>10</td>
</tr>
</tbody>
</table>
What do you think museums could do in order to make themselves more accessible to a new generation of younger, more tech-savvy scholars?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>answered question</td>
<td>16</td>
</tr>
<tr>
<td>skipped question</td>
<td>9</td>
</tr>
</tbody>
</table>

What is your role in the museum?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curator</td>
<td>18.8%</td>
<td>3</td>
</tr>
<tr>
<td>Library/Archives Staff</td>
<td>6.3%</td>
<td>1</td>
</tr>
<tr>
<td>Director/Manager</td>
<td>12.5%</td>
<td>2</td>
</tr>
<tr>
<td>Professional Scholar</td>
<td>6.3%</td>
<td>1</td>
</tr>
<tr>
<td>Student</td>
<td>12.5%</td>
<td>2</td>
</tr>
<tr>
<td>Rights and Reproductions Staff</td>
<td>6.3%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>56.3%</td>
<td>9</td>
</tr>
<tr>
<td>answered question</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>skipped question</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

What is your organization's annual operating budget?

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $100,000</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>$100,000-$500,000</td>
<td>13.3%</td>
<td>2</td>
</tr>
<tr>
<td>$500,000-$1 million</td>
<td>13.3%</td>
<td>2</td>
</tr>
<tr>
<td>$1 million-$5 million</td>
<td>6.7%</td>
<td>1</td>
</tr>
<tr>
<td>Over $5 million</td>
<td>26.7%</td>
<td>4</td>
</tr>
<tr>
<td>Prefer not to answer/do not know</td>
<td>40.0%</td>
<td>6</td>
</tr>
<tr>
<td>answered question</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>skipped question</td>
<td>10</td>
<td></td>
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</tbody>
</table>
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