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Digital Archives

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Abstract

This research examined the trend of digitizing archives and the problems digitization causes. A textual analysis was used to determine trends and issues related to this topic. The researcher used articles on the topic of digital archives from 1995 to 2000, as found in the Library Literature database and paper index. It was found that the research questions initially asked by the researcher are being asked in the population articles as well. The permanence of the digital archive is questionable, as is the digital document. The safety of the document is also at risk. The ability to access documents is in doubt as well. In short, digitization is a new phenomenon, and no professional knows what will become of archives in the digital age, other than there will be a great deal of change. The storage aspect of archives, as relates to the second research question, is uncertain as well, since the original electronic document is sometimes difficult to determine. The third research question: "Is digitization really the answer?" is the most difficult. There is no firm answer to this question in any of the articles used in the population.

The analysis found many issues connected to digitization. The preservation of digital documents is under debate with no clear solution readily available. Another issue is how to find specific documents or parts of documents once they have been digitized. The increased cost of digitization is also a problem. Perhaps the most important finding is the lack of initiative and of communication on the part of archivists, librarians, or those in the public sector to deal with the many issues of digitization.

In summary, digitization appears to be the solution for the preservation of archival materials while raising many more questions and problems. This research indicated a real and immediate need for more communication between archivists, librarians, and the private sector.

Digital Archives

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The analysis found many issues connected to digitization. The preservation of digital documents is under debate with no clear solution readily available. Another issue is how to find specific documents or parts of documents once they have been digitized. The increased cost of digitization is also a problem. Perhaps the most important finding is the lack of initiative and of communication on the part of archivists, librarians, or those in the public sector to deal with the many issues of digitization.

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Chapter 1

Introduction

We are all faced with storage problems. The problems librarians and archivists face is much more acute than where to put Grandma's water pitcher. These keepers of information are not only supposed to store documents safely, but also allow others to access the information over time. How to do that, while preventing a piece of paper from falling apart in the users' hands, is quite an issue. Is the answer digitization? Some would say yes, but digitization raises new questions about the way issues of permanence, safety and accessibility. If the librarian or archivist picks the wrong medium, how will people be able to get at the information? How does one read a punch card or a 5.5" floppy disk with today's technology? This study investigates what experts are saying about the issues involved in preserving archival materials in digitized formats.

Background: Digital Libraries

The book has been the principal format for preserving information since around 1450 (Coutts, 1997, p. 19). Since the 1970s, there has been a shift to electronic publishing, and more resources have become available in various formats. By 1991, computer technology was seen as an influence in campus library systems (Kopp, 1991, p. 536). Advances such as the online catalog, CD-ROMs, computer based search engines, and the Internet have made the possibility of twenty-four hour a day, seven days a week library usage a reality. Three issues surface when delving into the problem of electronic libraries: 1) the patron's ability to use the database; 2) accessibility at low cost; and 3) permanence of accessibility to the database. Once a library develops and maintains a webpage that can lead users to online sources, that

library has begun taking steps to become a digital library (Barber, 1996, p. 577). Therefore, Rod Library at the University of Northern Iowa in Cedar Falls, Iowa (UNI), with access via its webpage to online resources such as ERIC and the Internet, and the library at Hawkeye Community College in Waterloo, Iowa (HCC), because its webpage leads users to EBSCO and Newsbank, are two local libraries on their way to becoming digitized.

One key to becoming a digital library is ease of access. This new technology immediately offers new issues and problems as well. Both patrons and staff need to know how to use the resources and how to get to them. As the goal of librarianship is to promote information literacy and lifelong learning, the profession is rising to the challenge. The Ohio State University library has developed a system called the *Gateway to Information* that is designed to help students identify, find, evaluate, and select the most useful information for their needs (Teifel, 1995, p. 318). The problem arises of how to get the patron to the needed resource in the digital library. Both UNI and HCC have the ability to lead their off-campus patrons to full-text magazine articles. HCC has the added feature of a full-text newspaper archive in Newsbank. One can also browse the catalogs of these two institutions from one's living room. UNI also provides access to the ERIC database, the Lexis-Nexis newspaper and magazine archive, the IAC database, Internet search engines, and sites allowing the downloading of entire books. Some of these resources are free on the web. Due to licensing procedures and copyright laws, some databases are library-specific and can only be used by students, faculty, and staff of that college, in which case the students enter their names and library identification when accessing from off-campus.

Background: Archives

The main function of an archive is the handling of records of permanent value created by or received by an institution (Wurl, 1983, p. 4). Upon receipt of a set of records, the librarian most likely separates documents and reclassifies them by category. The archivist will keep papers from one office together and in chronological order, so as not to lose the purpose or relevance of the papers (Wurl, 1983, p. 7). Archivists often do not use catalog cards, preferring instead the inventory record, which allows for more description of what is actually in the file.

Archives tend to be seen as a stepchild of the library, though the archive was actually the forerunner. The earliest archives were the clay tablets of Mesopotamia, explaining the location of documents (5,000 Years . . .1985, p. 34). In 538, the emperor Justinian decreed treaties and acts be entered in the city registers and permanently preserved in a special public building called the *archeion* or *archivum* (Anon., 1985, p.1). In England, during the period of 1066 to 1307 the written word began to take precedence over the oral tradition (Yax, 1998, p. 57). In the late twelfth to early thirteenth centuries, an Archbishop of Canterbury, Hugh Walter, began to demand multiple copies of documents (Yax, 1998, p. 58). To bring things up to a more modern era, Arthur Agarde, a deputy Exchequer for Henry VIII, helped to bring order to the chaos of the office by writing inventories of, and creating directions to, the four treasuries of the Exchequer, and is also credited with establishing some of the major rules of the profession (Yax, 1998, p. 64-5).

The main difference between the library and the archive is the type of collection. Libraries normally contain books and periodicals, while archives usually hold unpublished and unique manuscripts (Rohfeld, Keenan, and Oddy, 1990, p. 1). Currently archives are recognized to be important for the

preservation of the culture and history of an area or institution. Archives are also organized by type of document within a collection (Rohfeld, Keenan, and Oddy, 1990, p. 2). The emphasis on an archive is preservation of paper documents, although that is changing slowly as the role of the archivist takes a more technological turn. As computers begin to play a larger part in the archives, some are suggesting the paper archive will become obsolete; however, a more likely scenario is the newer system will co-exist and supplement the original paper archive (Parker, 1985, p.2).

Most often archives form a section or department of an institution's library. Ideally, the administrator of an institution, such as the library director, would provide direction for the archivist. A committee, headed by the archivist, would be in charge of acquisitions, and would consist of members of the history department, the business department, the legal department, and administration (Burckel, 1979, p. 41). These members would help determine historical value of the documents, which documents would be useful in the future for staff, faculty and the community, and to preserve the confidentiality of files. The basic and permanent records that show the structure of the institution must be part of the archival collection (Crawford, 1979, p. 61). Sometimes the archives will include biographies and publications of personnel (Crawford, 1979, p. 61). The committee may be used for determination of the number of copies and what papers of which personnel need to be kept. These papers, published and unpublished, are what prevent the archivist from having a functioning acquisitions policy. Instead, an appraisal process is used. This process may condemn some materials for destruction when they do not meet the criteria for permanency (Wurl, 1983, p. 6).

Another new issue is automation of libraries, and therefore of archives. Archivists have often shown themselves to be resistant to technology

(Weimar, 1995, p. 2). This either comes from not having the background in automation or holding the viewpoint of electronic records being a separate medium from the rest of the collection (Weimar, 1995, p. 4). It is the author's belief archivists need the computer and electronics skills commonly taught to librarians in order to be able to function in this new information age. The additional problems of which records are to be saved becomes increasingly vital to the archivist as electronic formats change and the machines to access the information fade away. Also, as libraries become dependent upon the use of computers, patrons are coming to expect to be able to find information quickly. Speed may be difficult to achieve if the index of the archives is not computerized.

The University of Northern Iowa has digitized some of its archival holdings and has made these documents available through its web page. This portion of the archives contains biographies of past and present faculty members, and others important to the forming of the university, historical information on buildings, and traditions of the institution.

Libraries and archives share a general mission of acquiring, preserving, and making available information (Wurl, 1983, p. 3). The main differences lie in how they acquire and store this information. In some cases, the archival value may be in the medium, as well as the message. Physical documents may have great value because of the people attached to them (Banks, 1990, p. 91). Both professions share many of the same concerns over automation, space, and digitalization. As more libraries go online, further issues of copyright and freedom of information will arise. These issues and others will be further discussed in the following pages.

Problem Statement

Libraries are making the attempt to digitize and computerize their archives, placing the definition, storage, and place of archives very much in transition. The formats used for archival storage need to be permanent, safe, and accessible.

Research Questions and Issues

What will become of archives in the digital age? How permanent are computer-based archives? What kind of storage requirements exist for archives? Is digitization really the answer?

Definitions

The **archives**, for the purposes of this paper, will be defined as papers, documents, records and memorabilia related to an institution, i.e., a school or college. Quite frequently, these papers (to use a collective term) will include a vertical file of newspaper clippings about the institution, minutes of meetings, letters, memos, pictures, and even awards (Crawford, 1979, p. 62-4).

The **digital library** is mostly automated, which means it has an online catalog and other online databases accessible on or off-campus for its patrons (Barber, 1996. p. 581).

Digitization is the process of converting a paper document to an online or computer file (Berger, 1999, p. 147).

Assumptions

This paper makes the assumption schools will think it relevant to their mission to include archives in their library, whether at the K-12 or post-secondary level.

Limitations

The focus of this paper is primarily on archives, and will be limited to collections located in the United States as much as possible.

Significance

Archivists, librarians, and administrators need to be aware of problems archivists face in this age of new technology. It has often been the librarian who has dealt with the often overwhelming task of organizing so many different formats. Both librarians and archivists need special training to be better suited to decide what is to preserved for future generations and how to preserve it before more information is lost due to the obsolescence of the equipment which created it.

Chapter 2

Literature Review

As previously stated, libraries are making the attempt to digitize and computerize their archives, placing the definition, storage, and place of archives in transition. The formats used for archival storage need to be permanent, safe, and accessible. In this chapter, current research on the issues of libraries and archives, digitization of archives, the permanence of electronic archival formats, and the future of archives is examined.

Libraries and Archives

In a study produced by the Association of Research Libraries (1984), the place of archives within the library is examined. The methodology was a survey, sampling a population of 58 academic research institutions. This study indicated most university archives are attached to the library and are responsible for nearly all records. This would imply librarians and archivists share some concerns about their collection.

Eden (1997) compared how libraries and archivists perceive and follow preservation management techniques. His methodology compared two survey projects he was involved with. The population sampled was 682 British academic, national, public and special librarians, and 290 archives and records offices. He found both archivists and librarians face similar preservation problems.

Preservation problems are especially difficult in creating an archive. Falltrick (1999) had as her purpose to create an archive. Her methodology was

difficult to determine, as she examined material on how to create an archive as well as the documents that would become the archive. It appeared she used content analysis of records and materials, with her sample including one year's worth of church records. She addressed conditions, security issues, and disaster preparedness. As a result of her research, the collection was cataloged, stored properly in acid-free folders, and an index was created and adapted to the existing catalog.

Archival Digitization

Ester (1996) focused on how digitization differs from scanning and other ways of electronic preservation. His methodology was a content analysis of previous papers on digital imagery. His recommendation was that guidelines must be established for digitization projects and these projects must proceed according to an established plan to ensure cost-effectiveness.

Plans should be followed in order to keep information on a website viable as well. The 1998 study by McClure and Sprahe, had as its purpose to develop guidelines for better records management techniques and preservation strategies for electronic information available on state and federal websites. Its methodology was a content analysis of a sampling of state and federal policies and websites. They, too, found it necessary to establish guidelines. The result of their study was to create a model of such guidelines for website preservation.

MacNeil (1998) examined the evolution of the means of assessing the trustworthiness of records. She used content analysis of documents dating

from medieval times to the present. She found the ways of ensuring trustworthiness in a document may have changed, but the underlying principles have not. But, and this is outside the scope of her study, what if the document has been digitized?

Permanence

Law & Rosen (1989) developed a policy for the representation, access, transfer, and preservation of electronic records of permanent value. The methodology used was an examination or a comparison of the population of frameworks or standards currently in use. They found changes in the then-current policies and software must occur to suit the future needs of the archive.

In a related study, Waters and Garrett (1996) examined what was needed to make a digital library stable, accessible, and valid. They used a content analysis of materials already in digital form as of 1994. They found it necessary to establish a process of certification in order to create a climate of trust between user and creator.

Coleman and Willis (1997) provided a textual tutorial for SGML (a text interchange) to show its features and uses. Their methodology compared this program to others like it; their population included institutions actually using SGML. This study was a tutorial, demonstrating how to incorporate SGML with standards for ease of retrieval.

The Future

The current researcher is not the only one to attempt to determine trends in the archival field. In his study (1995), Weiner had as his purpose to identify issues and trends in archives and the automation of archives. Out of a general population of current literature, trends were identified by content analysis. His research showed an increase in the use of the Internet to archive documents.

Young (1997) attempted to determine what the status of special collections would be in the year 2015. Her methodology used a Delphi study, which involved a survey and a panel of experts. Her population was twenty professionals in the fields of archives, conservation, rare books librarianship, and records management. One of the trends she found was for increased usage of the archive by off-site users. Another conclusion she reached was that primary source preservation might become a low priority.

Storage

Oddy (1991) provided a history of KLARS, the Kellogg Library and Archive Retrieval System. It was an experimental model for preserving, organizing, and retrieving electronic documents. The population was the documents of the Kellogg Library. She did not come to any conclusions per se, although she did provide a summary of problems and suggestions for those attempting something similar.

In 1993, Franklin conducted a survey of members of the Modern Languages Association to find their preference for the preservation of the

original source documents. Her conclusion was microfilm should supplement, not replace, a print collection. Also, print was preferred over electronic documents. Her main conclusion was that the altered form of the document would alter the evidence produced by the record.

Summary

The studies described above agree the state of archives, preservation, and storage of materials is in a state of change. Some of the issues appear to be what to preserve, how to preserve it, and if the print original needs to be kept. The current study intends to examine current trends in storage and preservation of electronic archival documents.

Chapter 3

Methodology

As the previous chapter pointed out, archives in modern times are clearly in flux. The current researcher intends to demonstrate how archivists are taking steps to ensure the continuation of their collections and to provide access to the documents in their keeping.

Libraries are making the attempt to digitalize and computerize their archives, placing the definition, storage, and place of archives very much in transition. This state of transition is brought out by the studies mentioned in the literature review. The issues of digitization, preservation, and storage are also addressed. In order to analyze the data found, the current researcher has chosen to do a textual analysis of recent articles published about digital archives. This allows for important themes and concepts, as well as hypotheses, to be developed (Taylor & Bogdan, 1984, p. 130). Textual analysis is a type of qualitative research in which the theory comes from the data (Glaser & Strauss, 1967, p. 245).

This type of analysis calls for the researcher to approach the data with no set categories in mind. The categories and sub-categories will develop as the researcher sorts and codes the data during a sorting process. Through this process, data groups itself and generates categories (Glaser & Strauss, 1967, p.55).

As one sorts, one codes—by color, letter, or number—the themes and concepts found in the data (Taylor & Bogdan, 1984, p. 137). A working theory will develop as the process happens, describing the patterns and

relationships being discovered (Westbrook, 1994, p. 250). Coding has been described as a systematic way of developing and refining the interpretation of data (Taylor & Bogdan, 1984, p. 136); it is, in a way, a defining process. Since analysis and coding are occurring at the same time (Glaser & Strauss, 1967, p.101), the researcher is constantly reworking categories, hypotheses, and findings. This type of research is truly ongoing. The end comes when the sorts yield no new properties of the categories, what Glaser and Strauss call "theoretical saturation" (1967, p. 61). As the sorting process goes on, it is important to broaden definitions, as this will reduce the number of categories, clarify the hypotheses, and remove irrelevant material (Glaser & Strauss, 1967, p.110).

The goal of all qualitative research is to create meaning (Pauly, 1991, p. 11). As meaning becomes clear, it is recommended the researcher keep track of emerging themes and hunches (Taylor & Bogdan, 1984, p. 131).

The current researcher used as her population articles from 1995 to 2000 found in a search of Library Literature on disc, using the paper edition as a backup. The keywords used were: **Archives and Libraries**, with limits of **English language** and **1995-2000**; and **Archives and Preservation**, with the same limits. The keywords used for the paper edition were: **Electronic Data Preservation**, as the differences between the formats did not allow for duplication of search terms. A search of the disc version of Library Literature using the print search terms yielded different results from the original keywords. The current researcher filtered the results of these searches in order to locate articles focusing on electronic archival preservation or digitization. These studies focus on current trends in the field of archival and digitization in the United States and Canada. The list of articles is in Appendix A. In starting the textual analysis, each category of the literature

review was assigned a color, and the issues and trends were organized according to category. Using multicolor 3x5 cards, the "Future" section was yellow, "Storage" was pink, and so on. There was overlap between the categories, which led to repetition of some trends and issues. As some questions were answered, more were raised about the permanence, safety, and accessibility of digitization. The conclusions reached, therefore, cannot be firm.

Chapter 4

Analysis of Data

There was much overlap between the categories to start with, and this did not improve with ensuing sorts. Much of the research in archives has to do with the debate of sending everything to a central location or having individual businesses or institutions archive their own records, however haphazardly. There are also debates on finding aids and standards. Because digital documents are new in format and form, no one is sure if the existing methods of recording and establishing access points will work. As a result, there are a lot of studies going on but not much else.

Permanence of Digital Archives

The first sort eventually dealt with the preservation of the medium and content of digital archives. No one is sure of how to store digital archives. Some believe the documents should be put in a file on the institution's server. Others think the documents should be transferred to another, hopefully more stable medium, such as magnetic tape, CD-ROMs, or even DVDs. All state there is no passive solution to this problem, because electronic documents can be lost very quickly. One disheartening note is that some institutions have disposed of the original print documents after they have been digitized, without knowing how long the digitized copy will last.

Another preservation problem was how to keep digital documents current, or able to be used. One option is to refresh the documents, or copy the data from one physical carrier to another that is more advanced. Another option is conversion, which is transferring the document from one medium to another. The most popular option is migration, which is conversion from old technology to a newer one. Related to this, but not as popular because of cost, is emulation, in which new software mimics previous software that created the

document. The choice of retaining and maintaining obsolete or soon to be obsolete hardware and software is taken by some institutions, which are beginning to run into problems of cost of repair and lack of replacement parts. Most parties involved in this debate still believe microfilm is the most effective and economic way to store documents that originate in print form, and are also using it as a way to back up digital documents. Other problems briefly mentioned were problems with providing access points to users, and how to sift through the increasing quantity of data being generated.

Accessibility of Digital Archives

The topic of the second sort became archival digitization. The population of the sorts dealt both with documents that had originated in print format and had been digitized as well as those originating on an electronic format. Either format requires archival description as it is entered into the archive and many problems arise from this. The standards used to determine how a document is described need to be adjusted for electronic documents. These descriptions provide access points and finding aids, which are sometimes overlooked in putting the document on the Web. Most institutions that have gotten this far realize the search engine does not always fit the access points provided by archival standards. The issue of copyright, and which version of the document it covers, is still being explored. The National Archives and Records Administration, or NARA, has been saving electronic records of the federal government for many years, and is still dealing with a huge backlog of documents. Many state archives have not accessioned electronic documents either. The issue of the backlog is a part of the larger issue of how much archivists save. There is also a problem of how to determine the original version of the electronic document, and if each version should be saved.

Some institutions are calling for a recordkeeping system that documents the relationships between records. Also, there is a debate over having a centralized repository for electronic documents and those who want the individual to be responsible. Since there is so much ongoing maintenance required to save electronic documents, a few are even suggesting the archives may become part of the institution's computing center, especially at research universities. The impression is that no one seems sure of the technology and everyone is afraid to dispose of items, which may or may not be important to the next generations.

Cost Issues

What does the future hold for digital archives? All agree there must be an increase in public awareness or there will be no archives. Central repositories and consortiums may help support participating institutions and defray the costs involved with maintaining an electronic archive. As for the documents themselves, migration from old technologies to newer is the most cost-effective. Some are suggesting backward compatible software be developed to access information that would otherwise be lost. The best thing is still to backup everything on microfilm, because it is considered more stable a medium than a CDROM or DVD. There has been a suggestion for a digital tablet, a kind of laptop computer that stores the software and the documents in a heavy-duty, indestructible case, which sounds good in theory. The population literature suggests the institutions looking at digitizing are doing what is best for each institution.

Initiative to Proceed

The largest issue is that no one, librarians, archivists, or the public sector, is taking the initiative on how to select and connect records to ensure their longevity and usefulness. This may be because of lack of funding or lack

of knowledge about digitization of documents. More alarming, there is little communication between archivists and librarians and the public sector on how to preserve records. Businesses need to keep records too, and do not always hire a professional archivist. The person keeping records in the private sector is in a true limbo, and needs the support of the professionals in the area.

Part of the communication problem stems from no one knowing what to say about the new technology. No one knows the shelf life of a CDROM or DVD. Most of the technology in existence today will probably not be around in two to five years. This makes backup important. NARA has backed up thirty-eight years of electronic records with the current archival tape medium. Many other institutions choose microfilm. Migration has been found to alter the document it was intended to save, and if the person in charge of the process waits too long, migration may become impossible.

Safety of Digital Archives

The next sorts showed what kind of projects and problems with standards exist. The main issue was how to keep records current and usable. Concerns of public access and awareness and what to keep are a part of this issue. The use of new technology to store and view documents too frail to be handled is wonderful, but there needs to be some sort of backup system so the documents may still be viewed even if something happens to the technology. A few institutions are disposing of the original document after digitization occurs. This is not a good idea, because often digitization methods do not account for marginalia. Authenticity is another problem. Many authors were suggesting ways to prevent alteration of the electronic document.

Related Issues

The main issues when dealing with digital archives appear to be preservation and public awareness. Preservation as used here is a broad and

sweeping category, including methods and current projects involved with the problem. Maintenance of copyright and authenticity are also a part of this issue. Some are suggesting the copyright of a document be treated the same as a document in an archive, in which case the archive has the ownership, which would be easier in dealing with updates to new technology. Maintenance of the physical electronic records is much debated. The easiest and cheapest method is migration, and since backup of records is suggested, this could be done with microfilm. As for the actual preservation of records, the suggestion of digital tablets again arises. These would contain both hardware and software and have their own power source. It would preserve an entire database so it could be used as a laptop and be housed in an indestructible case. This is possible with today's technology and many are saying it is needed, but it must be made available at a low cost to make it feasible.

There are a plethora of projects abounding that are trying to determine standards for dealing with digital documents. The University of Pittsburgh Electronic Record Keeping Project, also known as the Pittsburgh Project, made the attempt to establish requirements and standards for electronic documents that would work with any system. It created definitions, requirements, a warrant for record keeping, and a metadata reference model. Metadata is the information about a record that may provide access points. Its goal was to develop archival standards for electronic records, in the belief that standards should come from the professions involved with record keeping. In existence from 1993 to 1996, many believe the Project made a good start (Marsden, 1997, Hedstrom, 1997, McClung, 1996, Duff, 1996).

The other main issue is public awareness. Libraries and archives need better communication with themselves and private companies, other fields and the general public. If something is not done and electronic documents are not

saved, it is possible the cultural heritage could be in jeopardy. Archival standards need to be introduced to institutions that keep records and are not libraries or archives. The general public needs to be made aware of the costs involved with preserving records and what could happen if these records are not kept, so that a funding base may possibly be established.

One more item of interest kept emerging from the sorts. That is the fact that although everyone is saying something needs to be done; very few are actually making an attempt to do anything. No legislation is being proposed that would create a national library or national group to deal with electronic records. No archival standards are being enforced or espoused. No effort is being made at better communication between archives, libraries and the private sector. What exists is a lot of issues, a lot of talk, a lot of studies, and no real, firm solutions.

Chapter 5

Summary, Conclusions, and Recommendations

The issues of permanence, safety, and accessibility are not solved by digitization, at least not yet. The possibilities of digitization appear to solve many problems for archives and libraries, but actually create many more in terms of cost, storage, and public awareness.

Conclusions

Digital archives appear to be the solution in the preservation of archival materials. However, digitizing documents at random just to be digitizing something is a waste of time and resources. There needs to be an overall plan to convert certain records to the new technology, for example, the most fragile or at risk documents. The plan should also take a backup system, such as microfilm, into consideration, and should also incorporate storage solutions for the original documents. It should also state how to update the electronic document, otherwise the institution is going to need to save the original technology that created it, and will become a museum of dinosaur equipment.

First and foremost, there needs to be better cooperation between libraries and archives. Librarians have the selection background and archivists know how to thoroughly describe an artifact or document, and the skills need to be combined. Statewide archival programs would be one solution. NARA actually has programs in place to assist state archival programs with problems they encounter, but there are few statewide programs. NARA has been dealing with electronic documents since 1968, and so has experience on its side in making suggestions. The suggestions and standards created by the Pittsburgh Project need to be revised and accepted by the specialists who asked for help.

The general public and researchers sometimes need repeated access to records. Digitization would ease this access, but only if it is done properly. Records must be easily found on a webpage, and easily retrieved. The problem is how to keep up the links to the documents and how to determine if the documents are being found. This is almost too big for individual states to handle. While the idea of a national archive is a good one, funding for it is a problem. If the general public and the casual researchers are made aware of the size and scope of the problem, a movement toward a national digital archive could be started.

The most overwhelming aspect of digitization is what to keep. Backups are needed. Originals need to be kept. According to *Armstrong vs. the Executive of the President*, emails are records under the protection of the Presidential Records Act. NARA has set up a record keeping system for them (Schuster, 1996). Should this mean every institution, every business, needs to keep and store each email sent? The answer depends on whether it contains possible historical value, much like personal letters. Since institutions and businesses often leave the decision of what to keep to a few individuals, standards are desperately needed. Businesses would profit from these firm standards, since they would no longer try to keep everything or give up in despair. Materials kept should be original to the institution, have historical value, and usually not be available elsewhere. A kept document should have value to the institution and for future study (Peace, 1996).

Recommendations

As more people research from a distance, using personal computers, more access to digital documents will be needed. The archival and library professions have quite a ways to go in meeting this increased demand. The concern of this paper is the permanence, safety, and accessibility of those

documents. More research needs to be done to see how a digital document can be made permanent, and remain digital instead of being transferred to another medium such as microfilm. The researcher needs to know the digital documents being used have not been tampered with. There needs to be a standard level of security for documents to prevent alteration. More importantly, the digital document needs to remain available for use over a period of years. These main issues need to be addressed in order for digitization to be a viable alternative to more conventional archival techniques.

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Appendix A

Reference List—Population

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