Electronic Preservation and Access: A Delicate Balance

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Preservation of important materials, whether cultural, historical, legal or even personal, has always been an ongoing challenge. Historically, preservation has focused on stabilizing and storing original, physical objects. To help preserve these originals, copies have often been made to protect the originals from damage and to allow greater distribution. With the introduction and rapid development of computers, a new tool has been added to the repertoire of institutions responsible for preservation. Although this has dramatically increased the level of service cultural institutions can provide, computers have introduced new preservation issues of their own.

The main goal of preservation is to allow continued use of materials over the long term; therefore, providing access to preserved items has always been an integral part of preservation. Unfortunately, ideal storage conditions (generally cold, dry, and dark, to slow physical deterioration) for traditional collections may limit or interfere with their use. Digital technology now provides unprecedented access to collections, both well-known and previously undiscovered.

Access to Information
One of the first ways computers were used to increase access to materials held in cultural institutions was simply to provide electronic versions of existing finding aids, such as registers or indices of holdings. These catalogs evolved into complex systems that not only allow faster and more precise discovery of materials within collections, but also reveal a wider array of relationships among items within a particular collection and to holdings in other collections. Just like analog reference systems, the usefulness of digital systems depends on the skills of those designing them. Digital technology doesn’t inherently make systems better, but it can certainly make them more effective.
Access to Collections

As better finding aids made materials more easily discoverable, the demand for use of these materials increased. The computer digitization of materials for display and distribution is helping institutions meet the technology-stimulated increasing demand. People now have greater opportunity to see what original artifacts look like without traveling to distant locations or waiting for the brief window of opportunity when a fragile item may be on display locally.

Many institutions, both small and large, are using digital technology to enable better access to their collections. At the U.S. National Archives and Records Administration (NARA), the Digital Imaging Lab has been scanning materials for over a decade, providing high quality copies of notable documents. NARA's Museum Programs, which includes exhibition, education, and publication activities, is the agency's largest user of this technology. More recently NARA has digitized materials for web-based virtual exhibits such as Our Documents (www.ourdocuments.gov) and NARA's online Exhibit Hall (www.archives.gov). The Library of Congress has also undertaken several expansive projects, including the American Memory (memory.loc.gov) and America's Library (www.americaslibrary.com) projects. Many libraries, archives, and historical societies are digitizing portions of their holdings.

Like analog copies, the availability of digital copies can reduce the handling of originals by acting as surrogates; the originals can then be stored in ideal, although sometimes less accessible, conditions. Unlike analog copies, digital copies can be replicated infinitely without loss and do not wear out with repeated viewing, so digital reformatting can allow much greater distribution to a wider audience. Whereas traditional reformatting (such as microfilming or photographic duplication) is typically done primarily to ensure preservation of physical materials, with the added and secondary benefit of allowing greater access to the content, the situation is reversed with digital technology. Digital reformatting is more often undertaken specifically to increase access to content; at the same time, however, by reducing handling of the originals, it also supports preservation efforts.

Limitations to Electronic Access: Two Emerging Myths

Two erroneous beliefs have emerged that can severely hinder the success of exploration for and use of primary source materials: If it's not on the web it must not exist; and If it's on the web it must be true. Younger people who have grown up with the Internet and the World Wide Web are most likely to hold these beliefs.

Myth 1: If it's not on the web it must not exist.

Many people, encouraged by the quantity of materials currently on the web, may believe that everything has been or soon
will be digitized. Although institutions are making greater use of the Internet as a means of providing access to their collections through on-line databases and virtual exhibits, it certainly should not be the only source for research. While the Internet does provide an excellent and convenient entry point for locating information, a large percentage of primary source materials are not available on the Internet. Cost and technology considerations make it unlikely that the Internet will ever be comprehensive enough to replace all other sources. Furthermore, the Internet is not without limitations as a delivery system. Depending on their own computer capacity, users may encounter problems with the quality and resolution of digital images that they can see, be unable to download large files, or face other technological difficulties in accessing and using on-line materials.

Costs

The truth is that digitization, especially at the image quality level people have come to expect, is very expensive. Collection preparation and indexing require time, so institutions incur significant labor costs long before scanning even begins. Contrary to popular belief, experts now recognize that reliable storage and management of electronic files is going to cost considerably more over the long term than storage of paper files would. Initial hardware purchase is only a portion of the never-ending costs related to safe storage of digital copies.

Priorities

Since institutions cannot digitize everything, they will have to prioritize what they will make available in electronic form. Each institution will start by digitizing those items and collections in their holdings that the institution itself believes are most important for the largest number of people to see, and which would focus attention on the organization’s special or unique materials. The institution may select a smaller number of items because of public demand and interest in those materials, or they may be included as part of a “scan-on-demand” program.

While the bulk of an institution’s holdings may be historically interesting or the organization may be legally required to maintain and preserve certain materials, it simply would not be economically appropriate to digitize everything. Only a very limited audience would ever need access to many things, and those users would not require the convenience of instant, on-line viewing of high-resolution images.

NARA currently has systematically digitized nearly 130,000 items. This represents only a tiny fraction of the 68 billion pages of textual material, and 50 million non-textual records within NARA’s holdings.

Myth 2: If it’s on the web it must be true.

Students and researchers need to examine all sources carefully, and use them selectively. Who created it? Who was the intended audience, and what was its expected use and purpose? Under what circumstances, or in what context, was it created and distributed? Does the book or website contain the entire document, or does the text or site contain only a portion of the complete source? What criteria were used to limit the selection to particular excerpts? What information or conclusions will the item support? Does it make sense to use this source for your particular research? Any document should be subjected to this kind of review, whether the user is working with a book, a manuscript, a newspaper—or a website.

Authenticity

Many users assume that just because they can access something on the Web, it must be true, accurate, legitimate, authentic, and valid. Often this will indeed be the case. There are many excellent collections of primary sources available electronically; it seems like each day brings new web resources from archives, libraries, universities, museums,
and historical societies. However, there are also many less legitimate sites that are equally easy to access.

Users should scrutinize materials they find on the Internet even more carefully and closely than they might a print copy of a book or document. Even before exploring the content and context of a document found on the web, researchers should assess the legitimacy of the site, but this can be very difficult to do.

In situations where the user lacks information about the document itself, the next best approach is to question who is running the website. Judge the quality of information contained on the website based on the reputation and trustworthiness of the owner of the website. Is it an individual or an organization? If an organization, is it a recognizable cultural, historical, or government institution? Does the organization hold the particular document in its own collections, or is it a third party that stores and delivers content for the owner of a document? Is that owner identified? Does the website give background information about the document? Is the document available in its entirety, or has it been excerpted? The researcher should only use materials once convinced that it comes from a legitimate website.

File Integrity

There is always the possibility that a file will be corrupted or altered during digital transfer. While digital signatures and other mechanisms are designed to guarantee that such problems do not exist, often users must assume the integrity of a document based on the reputation of the website owner.

Digitization and Implications for Preservation

All of these activities that make use of computers to provide greater access have generated a new problem for the preservation world. The issues include questions about re-formatting standards using digital technology, long-term storage considerations, and preservation of “Born Digital” items. Preservation of physical objects is a relatively mature field and established preservation programs exist in many cultural institutions. A new branch of preservation is developing to contend with the new issues that must be balanced with the benefits of increased access.

Reformatting Options

Traditional analog reformatting methods are well understood and have been tested and proven over time, but many institutions are starting to explore digitization as a new reformatting option for creating preservation surrogates. Discussion continues within the preservation community, and agreement has not yet been reached on final specifications or digitization methods that would produce a high-quality digital surrogate that could replace the original for many types of records.

When copying a textual document, is it enough to capture just the words so it can be read in the future, or must the appearance also be captured so someone can see what the pages looked like? If the document is printed on ivory paper, must it be digitized in color? The answer is usually, “It depends on the original.” Unfortunately, the huge volume of items to be digitized makes case-by-case decisions impractical, and uniformity is often desirable for coherent presentation.

Long-Term Storage

Computer scientists are still trying to determine what will be necessary for long-term retention of digital objects. In the context of human knowledge, digital objects are relatively new but are evolving rapidly. At this point, they are quite fragile and require great care to be useable in the future. Digital data is prone to corruption that can alter content or even render an entire file unreadable. Digital storage media is also fragile. Hard drives crash, CDs rot, and magnetic tape can break or be accidentally erased. Even if the data and the storage media remain intact, obsolescence is an ongoing problem. File formats are quickly replaced, applications and operating systems are upgraded without backward compatibility, and hardware becomes incompatible with each new development.
Although physical materials deteriorate, it is usually slow, and there are signs that can be monitored, so that preservation decisions can be made before information is completely lost. Problems with digital objects are much more likely to go unrecognized until too late. Often, the first sign of corruption is a message alerting the user that the file is unreadable. The best solution to date seems to be to maintain active management of electronic records in complex systems that check file integrity, backup regularly to remote facilities, and control access to authorized users. Data on removable media (such as CD-ROMs and DVDs), degrades over time as it sits on the shelf; in many cases, the data may be on borrowed time, if not already lost. Eventually, institutions hope to be able to manage the information instead of the technology that allows access to the information.

**Preservation of "Born Digital" Materials**

Finally, as the use of computers has grown, so has the volume of materials created electronically. Digitization of materials, and newly generated electronic finding aids create digital objects that must be themselves preserved in digital form. Preservation of these materials is of primary importance because they exist only in an ephemeral form that will always be machine-dependent. These items are subject to the same problems discussed previously, but no original analog copy exists or has ever existed. There are proposals to copy electronic data onto analog materials such as microfilm, but this solution would work only on a narrow range of types of items. Simple textual documents in electronic form and some types of images could be output to microfilm with minimal loss, but more complex objects like relational databases can only exist in their native form. Because of changes in technology, even some items created initially as machine-dependent analog materials, particularly audio recordings, can now only be copied digitally.

Computers can be of great benefit to the preservation world, but they should be used judiciously. They are only an addition to the already rich assortment of tools available for preservation, and should not be considered a replacement. The role computers play in preservation require new skills and perhaps rethinking of some aspects of preservation, to help institutions traditionally concerned with the past quickly and smoothly evolve to handle the new technologies of today.
Teaching Activity

Brainstorming

Ask students to pretend that they work for a large cultural institution that has in its collection thousands of significant artifacts and documents. Tell them that their institution has two missions: to preserve the materials and to provide access to them. Ask students to brainstorm ways that their institution might accomplish both missions. It is likely that their ideas might include digitization and online access. Allow this suggestion to lead into a discussion of the essay.

Small Group Activity

Divide students into 7 groups and assign each group one of the following topics addressed in the essay:

- Access to Information
- Access to Collections
- Limitations to Electronic Access: 2 Emerging Myths—Myth 1
- Limitations to Electronic Access: 2 Emerging Myths—Myth 2
- Digitization and Implications for Preservation—Reformatting Options
- Digitization and Implications for Preservation—Long-Term Storage
- Digitization and Implications for Preservation—Preservation of “Born Digital” Materials

Direct every student to read the essay’s introduction. Then members of each group should read and write a summary of their assigned section.

Large Group Discussion

Have the groups come back together and hold a class discussion. Ask one volunteer from each group to explain their issue to the class. Finish the exercise by asking students to look back at the results of the initial brainstorming activity. Ask students whether they want to revise their list, based on the information presented in the essay and subsequent small group and class discussions.
Lee Resolution and Declaration of Independence


Treaty of Alliance with France


Treaty of Paris

Northwest Ordinance


Articles of Confederation


Virginia Plan and U.S. Constitution


Executive Order 8802: Prohibition of Discrimination in the Defense Industry
War is raging in Europe and Asia, and United States defense-related industries expand as the nation supplies war goods to the fighting nations. A. Philip Randolph, President of the Brotherhood of Sleeping Car Porters, threatens to March on Washington if President Roosevelt doesn't make employment opportunities in the growing government-run defense industries available to African-Americans in addition to whites. In response, Roosevelt issues Order 8802 in June, banning discriminatory employment practices by federal agencies and all unions and companies engaged in war-related work. The order also establishes the Fair Employment Practices Commission to enforce the new policy.
1942—Continued

Joint Address to Congress Leading to a Declaration of War Against Japan
On Dec. 7, Japanese torpedo planes and dive-bombers kill almost 2,400 Americans and destroy hundreds of aircraft, battleships, cruisers, and destroyers at the U.S. Naval Base at Pearl Harbor, Hawaii. In response, President Roosevelt asks Congress to declare war on Japan, to avenge what he calls a “date which will live in infamy” when “the United States of America was suddenly and deliberately attacked by naval and air forces of the Empire of Japan.” He receives near-unanimous approval from Congress to declare war on Japan, and the United States enters the Second World War.

George Washington
/Farewell Address


Alien and Sedition Acts 1798


Federal Judiciary Act

Bill of Rights


Patent for the Cotton Gin

**Louisiana Purchase**


**Lewis and Clark**


**Marbury v Madison**


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**1945 Manhattan Project Notebook**

The Manhattan Project, so-called because it is run after 1942 by a section of the army code-named the “Manhattan District”, is assigned the task of developing an atomic bomb. This notebook records an experiment of the Manhattan Project, the all-out but highly secret effort of the federal government to build an atomic bomb during World War II. Recorded here is the world’s first controlled, self-sustaining nuclear chain reaction, achieved on Dec. 2, 1942.

**Surrender of Germany**

In France, on May 7, General Alfred Jochl signs the unconditional surrender of all German forces on all fronts, ending the European phase of World War II. The official German surrender, scheduled to take effect on May 8, follows Nazi leader Adolf Hitler’s suicide, Berlin’s surrender to the Soviet Army, and the surrender of several major German armies to British forces in northern Europe.

**United Nations Charter**

In Dumbarton Oaks, Washington, D.C., and San Francisco the Allied powers create an international agency that will resolve conflicts among members, and discourage aggressor nations with military force if required. This new agency is known as the United Nations.

**Surrender of Japan**

On Sept. 2, Japanese representatives sign the official Instrument of Surrender, prepared by the War Department and approved by President Truman. In eight short paragraphs, Japan surrenders to the Allies.

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[www.ourdocuments.gov](http://www.ourdocuments.gov)
Treaty of Ghent

McCulloch v Maryland

Missouri Compromise

Monroe Doctrine

Gibbons v Ogden

Andrew Jackson and Indian Removal
Brown v Board of Education

The Supreme Court’s decision in this case overrules the “separate but equal” principle set forth in the 1896 Plessy v Ferguson decision. The Court rules that “separate but equal” is inherently unequal and promotes racial supremacy. The unanimous decision states that state-sanctioned segregation of public schools is a violation of the 14th Amendment and is therefore unconstitutional.

1953
Armistice Agreement for the Restoration of the South Korean State
This Armistice formally ends the war in Korea. North and South Korea remain separate, and occupy almost the same territory they had when the war began.

1954
Senate Resolution 301, Censure of Senator Joseph McCarthy
In 1950 Senator McCarthy, spurred by national fears of communism, begins making accusations against members of the government, the entertainment industry, and business. Despite an inability to produce evidence for his charges, McCarthy grows increasingly aggressive in his accusations. By 1954, when the Senate votes to censure him, much of his power has dissolved. This censure describes his behavior as “contrary to senatorial traditions.”

1956
National Interstate and Defense Highways Act
This act authorizes the building of highways throughout the United States, the biggest public works project in the nation’s history.

Treaty of Guadalupe Hidalgo


Compromise of 1850


Kansas-Nebraska Act


Dred Scott v Sanford


The Civil War and Fort Sumter


Homestead Act


Morrill Act


Treaty of Guadalupe Hidalgo


Compromise of 1850


Kansas-Nebraska Act


Dred Scott v Sanford


The Civil War and Fort Sumter


Homestead Act


Morrill Act


1957
Executive Order 10730: Desegregation of Central High School
Although the Supreme Court rules the principle of “separate but equal” illegal in the Brown v. Board of Education case, Little Rock, Arkansas’ Central High School refuses to comply with the court. President Dwight Eisenhower sends in federal troops by Executive Order to maintain order and peace, allowing the integration of Central High School to proceed.

1961
President Dwight D. Eisenhower’s Farewell Address
In his farewell address, President Eisenhower warns against the establishment of a “military-industrial complex,” where power can easily be misplaced and misused.

1961
President John F. Kennedy’s Inaugural Address
President John F. Kennedy calls for the service of a “new generation of young Americans” to help protect liberty and freedom in the United States and throughout the world.

Executive Order 10924: Establishment of the Peace Corps
Following the ideals set forth in his inaugural address, President Kennedy establishes the Peace Corps as a way for young Americans to assist developing nations by providing educational, technical, and medical assistance. Goals of the Peace Corps include: 1) To help the people of interested countries and areas in meeting their needs for trained workers; 2) To help promote a better understanding of Americans on the part of the peoples served; and 3) To help promote a better understanding of other peoples on the part of Americans.

IN THE COUNCILS of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex.

The potential for the disastrous rise of misplaced power exists and will persist.

WE MUST NEVER let the weight of this combination endanger our liberties or democratic processes.

We should take nothing for granted.
**Emancipation Proclamation**

**The Civil War and U.S. Colored Troops**

**Gettysburg Address**

**Wade-Davis Bill**

**Lincoln’s Second Inaugural Address**

**Articles of Agreement Relating to the Surrender of the Army of Northern Virginia**

**Thirteenth, Fourteenth, and Fifteenth Amendments**
Purchase of Alaska

De Lome Letter
Trask, David. The War with Spain in 1898. Lincoln, Neb.: University of Nebraska Press, 1996.

Platt Amendment

Theodore Roosevelt/Foreign Policy

Sixteenth Amendment

Seventeenth Amendment

Keating-Owen Child Labor Act

Zimmerman Telegram

Woodrow Wilson’s Fourteen Points

Nineteenth Amendment

Boulder Canyon Project Act
**Tennessee Valley Act**


**National Industrial Recovery Act**


**National Labor Relations Act**


**Social Security Act**


**Second New Deal**


**Lend Lease Act**


**Executive Order 8802: Prohibition of Discrimination in the Defense Industry**


**Declaration of War Against Japan**


**Executive Order 9066/Japanese Relocation**


<table>
<thead>
<tr>
<th>Topic</th>
<th>Author(s)</th>
<th>Title</th>
<th>Publisher/Year</th>
</tr>
</thead>
</table>
Armistice Agreement For the Restoration of the South Korean State

Censure of Joseph McCarthy

Brown v Board of Education

National Interstate and Defense Highway Act

President Eisenhower and Desegregation of Central High School, Little Rock, Arkansas

Eisenhower’s Farewell Address

Kennedy’s Inaugural Address

Establishment of the Peace Corps

John Glenn’s Official Communication with the Command Center

Aerial Photograph of Missiles in Cuba
Test Ban Treaty

Program for the March on Washington/Civil Rights Act/Voting Rights Act

Tonkin Gulf Resolution

Social Security Act Amendments

1962
Transcript of John Glenn’s Official Communication with the Command Center
John Glenn conducts the first manned space orbit of the earth, increasing the prestige of the United States internationally. In this transcript he communicates with Mission Control in Florida.

Aerial Photograph of Missiles in Cuba
Instrumental in the early stages of the Cuban Missile crisis, these photographs show that the Soviet Union is amassing offensive ballistic missiles in Cuba. President Kennedy warns that any attempt by the Soviet Union to place nuclear weapons in Cuba will be seen as a threat to the United States.

1963
Test Ban Treaty
After the fears created by the Cuban Missile Crisis, the Limited Test Ban Treaty is signed by the United States, Great Britain and the Soviet Union. After Senate approval, the treaty, which goes into effect on Oct. 11, bans nuclear weapon tests in the atmosphere, in outer space, and under water.

Official Program for the March on Washington
On Aug. 28, approximately 250,000 people gather in front of the Lincoln Memorial to march in support of expanding civil rights for African Americans. The highlight of the march is Martin Luther King’s “I Have A Dream” speech, in which he proclaims the Declaration of Independence applies to people of all races.
1964
Civil Rights Act
Through the efforts of civil rights activists throughout the 1950s and early 1960s, many Americans come to support legislation that guarantees civil rights for African Americans, and President Lyndon Johnson signs the Civil Rights act into law in July. The act prohibits discrimination in public places, provides for the integration of schools and other public facilities, and makes employment discrimination illegal.

Tonkin Gulf Resolution
Passed by Congress after apparent attacks by the North Vietnamese on American ships in the Gulf of Tonkin, this act gives President Johnson authority to increase United States involvement in the war between North and South Vietnam.

1965
Social Security Act Amendments
Amid rising concern for the elderly and the poor, these amendments are adopted. They establish Medicare, a health insurance program for the elderly, and Medicaid, a health insurance program for the poor.

Voting Rights Act
This act outlaws the discriminatory voting practices adopted in many Southern states after the Civil War, including literacy tests as a prerequisite for voting. It also provides for federally supervised elections.
We the People of the United States, in Order to form a more perfect Union, establish Justice, ensure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

All legislative Powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives.