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Introduction

The Princeton University Library is central to the intellectual life on campus. It exists to serve a distinguished faculty, dedicated to the highest standards of teaching and research; an accomplished group of graduate students, striving to combine advanced study and original work of their own; and some 5,200 undergraduates, who have chosen a university famous for its emphasis on independent research. PUL builds and maintains collections, both analog and digital, to meet the needs of all of these groups and the unforeseen needs of researchers in the future.

Purpose

The Library has a strong commitment to preservation of materials in all formats. Digital objects—with their unique capabilities and characteristics—dwell in a dynamic, technologically rich environment. The goal of preservation of digital objects is the same as that of analog collection materials, to ensure access, however the means of achieving it require a related but different set of strategies and expertise.

The Digital Preservation Framework is an organizational tool that informs all aspects of digital preservation. It does not advocate for a new program across the Library, rather, its intention is to serve as a guide to ensure that we do the best we can using existing resources. Its purpose is to support the maturation of the Library’s digital preservation activities as we move from a project-based orientation to a program-based one. This document:

1. Offers a framework for improving and increasing digital preservation capability through the coordination of digital preservation activities across the Library.

2. Articulates general organizational responsibilities for the operation of a cohesive digital preservation approach by building upon current strategies within various Departments.

3. Provides a basis for planning and implementing policies and procedures that, where possible, adhere to prevailing standards and best practices in order to ensure effective use of resources.

Overall, the framework suggests a holistic way forward that will ensure the Library has well-managed digital objects in the short-term and, over the long-term, secures their preservation and sustained access by Princeton University faculty and students as well as the greater research community.

Objectives

Princeton University Library engages in digital preservation to ensure that its digital objects retain their availability, persistence, renderability, and authenticity. The Library will achieve this goal through the following objectives:
1. Identify, promote, and implement preservation strategies that will ensure the long-term viability for all digital objects for which the Library is the primary or sole steward.

2. Guide Departments and their respective Units to achieve their distinct intellectual and curatorial requirements while adhering to a shared digital preservation approach.

3. Where feasible and cost-effective, implement shared community standards—both technical and descriptive—for digital preservation and access that align with national and international standards and best practices.

**Commitment**

A commitment to digital preservation and access requires acknowledgement both of the stakeholder mandates and the scope of materials that this digital preservation framework addresses. The following stakeholders require or expect the Library to ensure the long-term preservation and access of digital materials:

1. **The Princeton University Board of Trustees**, which authorizes the Princeton University Archives to collect and preserve permanent records produced by the University, including its administration, academic offices, and student life, the evidence of which is increasingly digital in nature;
2. **Princeton University faculty, students, and staff**, who depend on the Library to serve the teaching, learning, and research needs of the University community;
3. **Collection donors and creators**, who assume their materials will be accessible irrespective of technological changes;
4. **Financial donors** that expect assurance of the Library’s infrastructure and capacity to meet the terms of their gifts;
5. **Consortia members and partners** such as ReCAP, Borrow Direct/Ivies Plus, and the HathiTrust, that rely on shared contractual obligations, including sustainable digital preservation at member institutions;
6. **External grants funders** that, through grant terms or memorandums of understanding, require institutions to ensure the long-term preservation and access of digital objects and research data in accordance with best practices.

**Scope**

The digital objects Princeton University Library is responsible for preserving can be classified into five broad categories:

- **Born-digital** archival collections, books, or materials that the Library purchases or acquires, where we have custody;
- Analog materials that are at risk of loss due to their extremely poor condition that the Library digitizes for preservation (for example, brittle books, reel to reel films and cassettes, and magnetic tape);
- Analog materials that the Library digitizes as a result of defined projects, patron requests, or external requests;
• Materials the Library receives, creates, and maintains through participation in external partnerships (e.g., Google Books Project) and consortial agreements (e.g. Borrow Direct, ReCAP;
• Materials the Library outsources for digitization (e.g., AV Preserve, Crowley, DDD, etc.).

Principles

Digital preservation and access at Princeton University Library aspires to the following principles. We:

1. Choose a Curation Lifecycle Model approach for the curation of digital objects that is facilitated and strengthened by documented guidelines or procedures for each lifecycle stage: conceptualization, creation, selection, acquisition, preservation, storage, access, and transformation.
2. Recognize that the planning and implementation of digital preservation is a shared responsibility that draws upon the expertise of many stakeholders throughout the Library.
3. Adhere to established national standards as well as community-based best practices to ensure well-managed collections over time.
4. Conform to archival principles pertaining to provenance, original order, authenticity and integrity of digital objects.
5. Comply with intellectual property, copyright, and ownership rights for all content.
6. Acknowledge that the dynamic nature of digital preservation necessitates the Library actively monitor technological developments in order to periodically assess and adjust its operations, resources, and procedures to ensure continued preservation and access.
7. Value interoperability in system design and use open-source technologies when possible.
8. Contribute to the development and direction of the broader digital preservation community.

Roles

Ensuring the long-term preservation and access of digital objects requires collaboration and distributed roles within and beyond the Library. Those roles include:

1. Creators, who donate or deposit digital objects to the custody of the Library;
2. Content specialists, who appraise, select, acquire, manage, and curate digital objects;
3. Format specialists, who digitize or otherwise migrate content from one format to another for preservation and/or access purposes;
4. Metadata specialists, who ensure digital objects are described according to applicable standards in order to facilitate long-term access;
5. **Preservation specialists**, who advocate for the long-term preservation and access of digital objects by lending guidance and support to Content and Format specialists;

6. **Technology specialists**, who develop software, procure hardware, implement backup and replication policies and procedures, and conduct auditing and reporting of systems.

**Responsibilities**

The execution of these roles occurs at three levels of responsibilities across the Library: organizational, functional, and technical. **Note:** The tables below do not add responsibilities onto any single department or individual, but instead simply map existing organizational duties with the language of digital preservation.

### A. Organizational Responsibilities

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Role</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define strategies to support long-term access to digital objects</td>
<td>Content, Preservation, and Technology specialists</td>
<td>Examples might include but are not limited to: Deputy and Associate University Librarians, Preservation Librarian, and Developers</td>
</tr>
<tr>
<td>Develop policies that specify the scope of collecting activities</td>
<td>Content specialists</td>
<td></td>
</tr>
<tr>
<td>Create and maintain submission agreements for digital objects</td>
<td>Creators and Content specialists</td>
<td>Examples might include but are not limited to: Curators and Subject Librarians</td>
</tr>
</tbody>
</table>

### B. Functional Responsibilities

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Role</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate responsible creation, acquisition, and submission of digital objects</td>
<td>Creators, Content, and Format specialists</td>
<td>‘Responsible’ in this capacity refers to practices reflecting the principles outlined in this document.</td>
</tr>
<tr>
<td>Document preservation strategies and monitor preservation environment</td>
<td>Format, Preservation and Technology specialists</td>
<td>Examples might include Digital Imaging Studio Manager, Preservation</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Role</td>
<td>Notes</td>
</tr>
<tr>
<td>----------------</td>
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</tr>
<tr>
<td>Employ technology watches or other technology monitoring notification systems</td>
<td>Format, Metadata, Preservation, and Technology specialists</td>
<td>This may include reading publications, subscribing to list serves, or working in inter-institutional working groups</td>
</tr>
<tr>
<td>Define process for refreshing storage media and updating hardware and software</td>
<td>Technology specialists</td>
<td></td>
</tr>
<tr>
<td>Manage locations of copies of all digital objects and ensure data synchronization</td>
<td>Metadata and Technology specialists</td>
<td>Synchronization in this instance refers to the process by which digital objects are updated across all locations when and if changes occur to data in one location</td>
</tr>
<tr>
<td>Maintain a systematic analysis of security risk factors</td>
<td>Preservation and Technology specialists</td>
<td>Examples include reviews of data, systems, personnel, and physical plant</td>
</tr>
<tr>
<td>Create and maintain plans for disaster preparedness and recovery</td>
<td>Preservation and Technology specialists</td>
<td></td>
</tr>
</tbody>
</table>
Appendix A: Glossary

authenticity: The quality of being genuine, not a counterfeit, and free from tampering, and is typically inferred from internal and external evidence, including its physical characteristics, structure, content, and context. [7]

born-digital: A descriptor for information that is created in digital form, as opposed to digitized from analog sources. [5]

Curation Lifecycle Model: An approach that documents the relationships between all stages of digital information—conceptualization, creation, selection, acquisition, preservation, storage, access, and transformation—to enable active management of the resource over time, thus maintaining accessibility and usability. [4]

digital object: A conceptual term that describes an aggregated unit of digital content comprised of one or more related digital files. These related files might include metadata, derivative versions and/or a wrapper to bind the pieces together. [6]

digital preservation: The series of managed activities, policies, strategies and actions to ensure the accurate rendering of digital content for as long as necessary, regardless of the challenges of media failure and technological change. [6]

integrity: The quality of being whole and unaltered through loss, tampering, or corruption. [7]

interoperability: The capability of a computer hardware or software system to communicate and work effectively with another system in the exchange of data, usually a system of a different type, designed and produced by a different vendor. [1]

open-source: A descriptor of a computer program for which the source code is made available without charge by the owner or licensor to encourage the rapid development of a more useful and bug-free product through open peer review. [1]

original order: The organization and sequence of records established by the creator of the records. [7]

persistence: The ability to address and locate a digital object on a network or in a digital archival system over an extended period of time. [1]

provenance: 1) The origin or source of something; 2) Information regarding the origins, custody, and ownership of an item or collection. [7]

renderability: The capability to process a digital object (generally with a software application) in order to view, listen to, or interact with the content. [2]

submission agreement: A legal document through which a creator grants an institution the right to electronically store, convert, and copy digital objects for preservation purposes. [3]
Glossary Sources


4. Digital Curation Centre (UK) Glossary http://www.dcc.ac.uk/digital-curation/glossary

5. Inter-university Consortium for Political and Social Research (ICPSR) Glossary of Social Science Terms http://www.icpsr.umich.edu/icpsrweb/datamanagement/support/glossary


Appendix B: Resources Consulted

A. Strengths and Limitations of Digital Preservation Policies

  http://www.webarchive.org.uk/wayback/archive/20140615022334/http://www.jisc.ac.uk/ 
  media/documents/programmes/preservation/jiscpolicy_p1finalreport.pdf
  http://metaarchive.org/public/resources/pres_comm/policy_planning/Digital_Preservation 
  _Policy_Template.pdf
  study
  http://www.digitalpreservation.gov/documents/Analysis%20of%20Current%20Digital%2 
  0Preservation%20Policies.pdf?locId=blogsig

B. Policies of Peer Institutions

- Columbia University Libraries 
  http://library.columbia.edu/services/preservation/dlpolicy.html
- Cornell University Library 
  http://ecommons.library.cornell.edu/bitstream/1813/11230/1/cul-dp-framework.pdf
- Dartmouth College Library 
  http://www.dartmouth.edu/~library/digital/about/policies/preservation.html?mswitch- 
  redir=classic
- Inter-university Consortium for Political and Social Research 
  http://www.icpsr.umich.edu/icpsrweb/content/datamanagement/preservation/policies/dpp 
  -framework.html
- State Library of North Carolina and State Archives of North Carolina 
- The Ohio State University Libraries 
- UMass Amherst Libraries 
  http://www.library.umass.edu/assets/aboutus/attachments/University-of-Massachusetts- 
- University of Manchester Library 
  http://www.library.manchester.ac.uk/aboutus/strategy/_files2/Digital-Preservation- 
  Strategy.pdf
- University of Maryland Libraries 
  http://drum.lib.umd.edu/bitstream/1903/14745/1/DigitalPreservationPolicyUMD2013- 
  07Final.pdf
- Yale University Library http://www.library.yale.edu/iac/DPC/revpolicy2-19-07.pdf

C. Standards and Concepts

- Audit and Certification of Trustworthy Digital Repositories http://public.ccsds.org/publications/archive/652x0m1.pdf
- Reference Model for an Open Archival Information System (OAIS) http://public.ccsds.org/publications/archive/650x0m2.pdf
- The Five Organizational Stages of Digital Preservation http://quod.lib.umich.edu/spobooks/bbv9812.0001.001/1:11?rgn=div1;view=fulltext
- Trustworthy Repositories Audit & Certification: Criteria and Checklist (TRAC) http://www.crl.edu/sites/default/files/d6/attachments/pages/trac_0.pdf