DIGITAL PRESERVATION POLICY FRAMEWORK

Purpose

This statement formalizes The Ohio State University Libraries (OSUL) continuing commitment to the long-term stewardship, preservation of and sustainable access to its diverse and extensive range of digital assets. In alignment with the OSUL mission to create, acquire, organize, disseminate, and preserve scholarship, this policy makes explicit OSUL's long-term commitment to The Ohio State University (Ohio State) community as its trusted digital repository. The OSUL's digital stewardship efforts contribute to Ohio State's mission to build a world-class faculty, develop academic programs that define Ohio State as the nation's leading public land-grant university, improve the quality of the teaching and learning environment, enhance and better serve the student body, create a more diverse university community, and help build Ohio's future by ensuring access to this corpus of information over time.

Objectives

The primary purpose of digital stewardship and preservation is to preserve the intellectual and cultural heritage important to The Ohio State University, while at the same time making sure that it is accessible and held in trust for future use. The objectives in this statement define a framework to:

- identify, through systematic selection, digital assets to be preserved across new generations of technologies
- maintain access to reliable data at bit-stream level, the digital assets encoded in the bit streams, and access to the intended contextual and intellectual meaning of the digital assets
- include in the scope of the program materials that originated in digital form and those that were converted to digital form
- protect OSUL's digital investments through a fully-implemented digital preservation program
- demonstrate organizational commitment through the identification of sustainable strategies
- develop a cost-effective program through means such as, system-wide integration, shared responsibilities, and automating human-intensive efforts, when possible
- comply with prevailing community standards for digital preservation and access
- seek, expand, and develop digital preservation methods that are appropriate for Ohio State and promote inter-institutional collaboration

Mandate

OSUL's mandate for digital preservation is at least five-fold:

- **Scholarship:** As an institution of higher education, The Ohio State University is obligated to support scholarship, teaching, and learning. As more resources and services associated with these functions become digital, OSUL's responsibilities must expand to include the identification, stewardship, and preservation of designated digital content.
- **Institutional records**: Ohio State has charged OSUL with maintaining the University Archives by collecting and preserving university records that best document the history of Ohio State, including those in electronic format.
- **Legal obligations:** Ohio State has mandated responsibilities to preserve and maintain access to certain digital objects, as well as responsibilities as a designated land grant institution. Some legal obligations derived from Federal and State laws require us to maintain files in an archival fashion.
- **Organizational commitment:** OSUL's commitment to digital preservation is explicitly cited in the initiatives in OSUL's current strategic plan:
  - which calls for OSUL to develop and implement a cross-divisional plan for supporting curation, storage and dissemination of library-created or library-managed digital content
  - which calls for OSUL to build a robust, reliable, secure technical infrastructure base including both human and technology resources.
- **Consortia and contractual commitments:** OSUL has commitments to consortia (e.g. OhioLINK and Hathi Trust) and contractual agreements to assume or share in the responsibility for preserving designated digital content.

Scope

This policy addresses preservation of digital collections and resources for which OSUL is the primary custodian. Although this policy only covers digital collections and resources for which OSUL is the primary custodian, OSUL has responsibility for informing, consulting, and as appropriate coordinating with other units of The Ohio State University to assure that Ohio State faculty, staff, and students will have adequate ongoing access to administrative, scholarly, and other digital resources created at Ohio State outside of the Libraries. Further, OSUL personnel will also work externally through consortia (e.g. the Committee of Institutional Cooperation (CIC) and OhioLINK), licensing agreements, etc., to assure that Ohio State faculty, staff, and students will have adequate ongoing access to all currently available digital resources. OSUL, however, cannot guarantee preservation for materials that we do not own and manage.

Challenges

There are recognized challenges in implementing an effective digital preservation program, including but not limited to:

- *Rapid growth:* Technology that enables the variety of formats and dissemination mechanisms changes rapidly. As different types of materials are submitted (data sets, complex digital objects), monitoring different needs (storage size, metadata, etc.) of the materials and maintaining procedures and policies based on these needs is necessary.
- *Sustainability*: Developing a sustainable digital preservation model that will respond to technological and staffing changes as needed, without under- or overestimating the needs imposed by these changes. The need for good cost models and affordable programs is widely acknowledged, yet still not fully addressed. OSUL requires sufficient funding for operations and major improvements for digital asset management, as well as designated library funding to sustain ongoing preservation efforts. Further, there are administrative complexities in ensuring cost-effective and timely action to implement preservation strategies. The scale of funding is based on the level of commitment, therefore the program should reflect reasonable expectations of requisite resources, i.e., OSUL should not promise more than can be delivered.
- *Management*: Moving from well-managed digital collections to preserved collections in the true sense of the term requires institutional effort, partnership development, and a financial commitment. OSUL should provide a thoughtful balance between access and preservation, while being mindful of preservation's core role in maintaining access.
- *Partnerships*: OSUL must work with creators and providers of crucial content to employ appropriate maintenance prior to deposit that will facilitate future preservation.
- *Flexibility*: The digital preservation plan must continually revise its abilities to respond to the evolving technological capabilities and changing user expectations without jeopardizing the ongoing care of the digital content.
- *Expertise:* OSUL must commit to continually updating staff expertise, where appropriate, as technologies change.
- *Rights:* There are a myriad of intellectual property and other rights-based constraints on providing access that impact digital preservation efforts.

Principles

Guiding principles

OSUL will use consistent criteria for selection and preservation as for other resources in the libraries. Materials selected for digital stewardship and preservation carry with them OSUL's commitment to maintain the materials for as long as needed or desired.

- The Libraries are committed to the long term preservation of selected content.
- Digital preservation is an integral part of OSUL's processes
- Processes, policies, and the institutional commitment are transparently documented.
- Levels of preservation and time commitments determined by selectors, curators, in consultation with technical experts
- OSUL will participate in the development of digital preservation community standards, practice, and solutions.

Operating principles

The Library will strive to:

- Develop a scalable, reliable, sustainable, and auditable digital preservation infrastructure
- Manage the hardware, software, and storage media components of the digital preservation function in accordance with environmental standards, quality control specifications, and security requirements
- Comply with the Open Archival Information System (OAIS) and other appropriate digital preservation standards and practices
- Ensure that the digital archive is as interoperable as possible by utilizing open source options whenever feasible
- Ensure the integrity of the data
- Secure metadata (e.g. administrative, descriptive, preservation, provenance, rights and technical) necessary for the use of the digital assets
- Comply with copyright, intellectual property rights and/or other legal rights related to copying, storage, modification and use of digital resources.

Standards

- Ohio State is best served when distributed and disparate systems conform to standards and best practices that make communication between these storage systems possible.
- To utilize the OAIS Reference Model for as the basis for developing and implementing strategies and tools for long term digital information preservation and access.

Categories of commitment

OSUL's levels of commitment as outlined below recognize that developing solutions for "born digital" materials informs solutions for the other categories; it does not imply that these assets are inherently more valuable or important than any of the other categories and/or our traditional, analog materials.

- **Born digital materials:** Rigorous effort will be made to ensure preservation in perpetuity of material selected for preservation, both library resources and institutional records.
- **Digitized materials (no available analog):** Every reasonable step will be taken to preserve materials without a print analog, when re-digitizing is not possible or no analog versions are located elsewhere. Also included are digitized materials that have annotations or other value-added features making them difficult or impossible to recreate.
- **Digitized materials (available analog):** Reasonable measures will be taken to extend the life of the digital objects with a readily available print analog. However, the cost of re-digitizing as needed will be weighed against the cost of preserving the existing digital objects
- **Commercially available digital resources:** OSUL has responsibility for working externally through consortia, licensing agreements, etc. to assure that one party or parties provides the necessary infrastructure to provide for preservation activities, so that Ohio State faculty, staff, and students will have adequate ongoing access to commercially available digital resources. If the resources are external to OSUL, there

needs to be an articulated exit strategy in the event of the cessation of the consortia or licensing agreements. Particular emphasis should be given to resources which exist in digital form only.

- **Other items and materials:** No preservation steps will be taken for materials requested for short term use such as materials scanned for E-reserve and Document Delivery, or for content that is deemed unessential.

Levels of Preservation

Digital Archiving Maturity Model

- Level 1 - safe storage –simple bit-level storage on magnetic or optical storage with some level of reassurance that the bits are protected against simple storage failure.
- Level 2 - storage management – moves the bits to the most appropriate location. The decision on which bits are located where maybe done on the basis of storage durability, cost reduction, or performance.
- Level 3 - storage validation –multiple object storage plus fixity checking to validate storage durability. Object fixity is checked on storage, access and at regular intervals to confirm objects have not been tampered with. If bit failure is identified, self healing from an alternative copy will occur.
- Level 4 - information organization – incorporates information hierarchy organization, descriptive data management, and simple processes for uploading, locating and downloading information. Basic information security is also included.
- Level 5 - information processes – efficient and flexible business processes to automate the activities associated with information management. These include interfaces to the information sources and dissemination to information consumers using flexible workflows and programmer interfaces. They also include high-throughput capabilities and integration with a third party identity management system. Non-archiving processes such as object versioning, should be excluded
- Level 6 - information preservation – capabilities to ensure that the information stored is usable when it is needed by the audience that requests it. Includes variety of strategies to ensure the information is accessible for as long as it is needed.

This *Digital Archiving Maturity Model* was developed by Tessella Technology and Consulting (© Tessella plc 2012)

Roles and Responsibilities

OSUL has identified the following stakeholder categories for the digital preservation program. The terminology is adapted from the OAIS Reference Model (CCSDS 650.0-M-2 (2012))

- **Producer:** The role played by those persons or client systems that provide the information to be preserved. Producers include faculty, students, staff, alumni, collectors, creators of content, publishers, and others. Producers can also be other OAISes or internal OAIS persons or systems. Producers will be responsible for complying with established deposit requirements and working with the management of the digital archive to ensure a successful transfer. (expanded OAIS definition)

- **Management:** The role played by those who set overall OAIS policy as one component in a broader policy domain, for example as part of a larger organization. The OSUL Executive Committee will be responsible for setting digital preservation policies and integrating them into broader organizational contexts. (expanded OAIS definition)
- **Administrators:** Content stewards (designated staff responsible for selection and for ongoing curation of specific collections), digital preservation specialists and working teams (see appendix for list).   Administrators will be responsible for the establishment of the digital preservation program and for day-to-day management of the digital archive(s). *[Note: OAIS uses Administration Functional Entity: The OAIS functional entity that contains the services and functions needed to control the operation of the other OAIS functional entities on a day-to-day basis.]*
- **Co-operating Archives:** (OAIS definition) Those Archives that have Designated Communities with related interests. They may order and ingest data from each other. At a minimum, Co-operating Archives must agree to support at least one common Submission Information Package (SIP) and Dissemination Information Package (DIP) for inter-Archive requests. Examples include: the CIC, OhioLINK, DuraSpace. (expanded OAIS definition) At OSUL we think of this group as collaborators.
- **Consumer:** The role played by those persons, or client systems, who interact with OAIS services to find preserved information of interest and to access that information in detail. This can include other OAISes, as well as internal OAIS persons or systems.
- **User Groups /Client Groups:** The various types of clients who use OSUL's digital collections.

Collaboration/Cooperation

OSUL acknowledges digital preservation as a shared community responsibility, and as such has long-standing and emerging partnerships with similarly committed organizations (e.g. CIC and OhioLINK) and is committed to collaborating with other institutions, as well as with units within Ohio State to:

- advance the development of the digital preservation program
- share lessons learned with other digital preservation programs
- extend the breadth of our available expertise
- extend the digital content that is available within a broad information community to OSUL users through cooperative efforts

Generally, in working, cooperating and collaborating with others, OSUL desires to:

- understand the goals, objectives, and needs of the communities of creators and the communities of consumers of its digital resources
- identify appropriate partners and stakeholders to contribute to national and international efforts in digital preservation
- help develop national and international strategies and initiatives that enable the distribution of collecting, description, service delivery, digitization and preservation activity
- work actively with creators of digital materials to encourage and promote standards and practices

Access and Use Criteria

OSUL acquires, manages, and preserves digital resources so that they remain accessible to its constituents over the long term. Certain limitations may be placed on access due to legal, donor and/or other reasons, but, in general, in so far as possible, OSUL endeavors to make its digital resources accessible to all users.

Implementation

Implementation of this policy framework is contingent upon the infrastructure (technological and human resources) provided by Ohio State and OSUL, the availability of cost-effective solutions, the adoption of standards, and development of best practice and procedures.

Review Cycle

This policy will be reviewed at minimum annually to assure timely revisions as technology progresses and preservation strategies and experience mature.

Appendix 1: Administrators

Position	Individual	Responsibilities
Collections Strategist	vacant	Collaborates with others to create and implement innovative approaches to providing effective stewardship of print and electronic collections
Electronic Records & Digital Resources Archivist	Dan Noonan	Works collaboratively and consultatively with the Libraries' Information Technology Division, specifically Digital Initiatives, Digital Content Services, and Special Collections, as well as other appropriate areas of the Libraries to ensure the preservation of and access to digital collections.
Head of Preservation and Reformatting	Wes Boomgaarden	Leads the Libraries efforts in collaboration with subject specialists, curators, and staff in protecting and preserving the Libraries' collections.
Head of Research Services	Meris Mandernach	Leads the Libraries research services which includes traditional and emerging forms of reference services; collaborates with colleagues to develop and promote research services essential to research productivity and enhanced learning
Head of the Copyright Resources Center	Sandra Enimil	Leads the dissemination of copyright information and resources to the Libraries and the Ohio State community. Works collaboratively and consultatively with others in determining copyright and rights issues for digital assets.
Head of Digital Content Services	Tschera Connell	Participates in planning, decision-making, and implementation of digital initiatives; works collaboratively to determine and implement appropriate delivery and preservation strategies for the Libraries' unique digital content and campus partners' content
Head of Digital Initiatives	Terry Reese	Guides the development and implementation of digital asset and data management strategies, policies, standards, and procedures that support storage and preservation of the Libraries' digital assets and resources.
Head, Applications Development and Support	Beth Snapp	Collaborates with the Libraries' IT Division to research, articulate, plan, implement, and support systems and services environment that supports the Libraries strategic directions.
Systems Administrator & Integration Coordinator	Travis Julian	Works collaboratively and consultatively to develop and implement effective infrastructure for the stewardship and preservation of the Libraries' digital assets and resources
Curators	various	Responsible for the preservation of and providing access to the selected materials under their purview
Metadata services staff	various	Provides appropriate description, technical, administrative, ... data to support preservation activities

Position	Individual	Responsibilities
Technical staff	various	Provides operational support for the platforms used for preservation purposes

Appendix 2: Glossary

Access: The processes for the retrieval of data and information from storage media, through the use of catalogs, indexes, and/or other tools.

Acquire: To take physical and legal custody of data and information.

Analog: Data and information in a format that must be digitized to make it digitally accessible.

Bit-Level Preservation: Bit-level preservation is a minimum digital preservation standard; the goal is to maintain the integrity of the original bit-stream of a digital object. It is accomplished by maintaining backup copies (onsite and/or offsite), the periodic refreshing of those copies to new storage media, and conducting virus and fixity checking.

Born Digital: Data and information created in a digital format and maintained digitally.

CIC: The Committee on Institutional Cooperation (CIC) is an academic consortium of the Big Ten member universities plus the University of Chicago, governed and funded by the Provosts of the member universities**.**

Collection: A group of materials assembled by a person and/or organization, with some unifying characteristic(s).

Curation: The activity of managing data and information throughout its lifecycle, ensuring that data are properly appraised, selected, and securely stored, while appropriately maintaining logical and physical integrity and authenticity. Further, the data is made and remains accessible and viable in subsequent technology environments.

Data Sets: A collection of data. The data formats include but are not limited to flat file tabular data, relational databases, text corpora, qualitative data in field notes, scholarly editions, and thematic research collections.

Digital Asset: A digital object (e.g. text, image, audio-visual file) owned or managed by an institution (or person) that has the rights to use it.

Digital Object: An entity in which one or more content files and their corresponding metadata are united, physically and/or logically, through the use of a digital wrapper.

- *Complex Digital Object:* Includes two or more content files (and their format variants or derivatives) and corresponding metadata. The content files are related as parts of a whole and are sequenced logically, such as pages.
- *Simple digital object:* Comprised of a single content file (and its format variants or derivatives) and the metadata for that file. (California Digital Library, *Glossary*, 2012)

Digital Preservation: Digital preservation is a comprehensive set of managed activities that are necessary to provided continued access to digital objects, beyond the limits of media failure or technological change. At minimum it should include bit-level preservation.

Digitized Materials: Analog materials that have been transformed into digital form, especially for storage, access and use in a computer environment.

Hathi Trust: is a partnership of more than sixty major research institutions and libraries worldwide working to ensure that the cultural record is preserved and accessible long into the future.

Institutional Records: Data or information in a fixed form, regardless of medium, that is created or received in the course of institutional activity and maintained as evidence of that activity for future reference.

Open Archival Information System (OAIS) Reference Model: A high-level model that describes the components and processes necessary for a digital archives, including six distinct functional areas: ingest, archival storage, data management, administration, preservation planning, and access. (Richard Pearce-Moses, *A Glossary of Archival and Records Terminology*, Society of American Archivists 2005) Full reference model and specifications: *Reference Model for an Open Archival Information System (OAIS), Recommended Practice, CCSDS 650.0-M-2, Magenta Book*, Space Communications and Navigation Office, NASA, June 2012

Object Fixity: The quality of a digital object to be stable and resist change.

OhioLINK: The Ohio Library and Information Network (OhioLINK) is a consortium of 89 Ohio college and university libraries, plus the State Library of Ohio, that work together to provide Ohio students, faculty and researchers with the information they need for teaching and research.

Provenance: Information regarding the origins, custody, and ownership of an item or collection. (Richard Pearce-Moses, *A Glossary of Archival and Records Terminology*, Society of American Archivists 2005)

Reformatting: The process of creating a copy with a format or structure different from the original, for preservation and/or access; this may be accomplished via, transcription, xerography, microfilming and/or digitization.

Scholarship: Intellectual resources managed by the Libraries that are used for research, teaching, and learning.

Stewardship: the responsible overseeing and protection of something considered worth caring for and preserving (Dictionary.com)**.**

Sustainable Access: Having the necessary resources (fiscal, human resources, and technological) to continually provide access to information and digital objects maintained in a repository.

Trusted Digital Repository: A repository whose mission is to provide reliable, long term access to managed digital resources to its designated community, now and in the future (RLG-OCLC). "Trustworthiness" should be quantifiable via an assessment tool applied to a repository conceptual model (e.g. TRAC tool for OAIS Model)

Appendix 3: Sources Consulted

The following are resources that were consulted in the development of this policy framework:

- Cornell University Library *Digital Preservation Policy Framework* (December, 2004)
- H-Net: Preserving and Improving Access to Specialized Electronic Mailing List Archives - *Digital Preservation Policies and Procedures*
- ICPSR (Inter-university Consortium for Political and Social Research)
  - *Access Policy Framework* (June 28, 2010)
  - *Collection Development Policy*
  - *Digital Preservation Policy Framework*
- IDEALS (Illinois Digital Environment for Access to Learning and Scholarship at the University of Illinois at Urbana-Champaign) *Digital Preservation Policy* (November, 2009)
- Library and Archives of Canada - Digital Policies, Guidelines and Tools - Digital Preservation Policy (retrieved September 13, 2012 - no longer available on Internet)
- National Archives of Australia *Digital Preservation Policy* (July, 2011)
- National Library of Australia *Digital Preservation Policy 4th Edition* (2013)
- North Carolina Department of Cultural Resources *Digital Preservation Policy Framework* (September, 2005)
- Purdue University Research Repository *PURR Digital Preservation Policy* (February 23, 2012)
- *Reference Model for an Open Archival Information* System (OAIS), Recommended Practice, CCSDS 650.0-M-2 (Magenta Book) Issue 2, June 2012
- Tessella - *Digital Archiving Maturity Model*
- University of Massachusetts, Amherst Libraries - *Digital Preservation Policy* (May, 2011)
- University of North Carolina at Chapel Hill, The Howard W. Odum Institute for Social Science *Digital Preservation Policies* (2011)
- University of South Carolina Libraries' *Digital Preservation Policy Framework* (September, 2010)
- University of Utah, J. Willard Marriott Library Digital Preservation Program: *Digital Preservation Policy* (April, 2012)