UVic Libraries’ Digital Preservation Framework
Digital Preservation Working Group
2 September 2020

Purpose
This document formalizes the University of Victoria Libraries’ continuing commitment to the long-term preservation of a diverse and extensive range of digital materials under its care. It identifies high-level principles and priorities for implementing a digital preservation strategy in support of the Libraries’ overall goals and strategic directions.¹

What is digital preservation?
Digital preservation is the active management of digital content over time to ensure ongoing access.² It is a formal endeavor on the part of an organization to ensure that digital material of continuing value remains accessible and usable. Much more than just long-term storage, it involves a number of key activities, as well as building the organizational capacity to undertake them. These activities include:

1. The appraisal, selection, and/or identification of digital materials of enduring value.
2. Ensuring the integrity of such materials over time through responsibly-developed and frequently-reviewed policies and procedures, including the ability to demonstrate authenticity and/or trustworthiness. Examples include the application of preservation-friendly metadata, undertaking file characterization and fixity checking, data replication, and the provisioning of distributed archival storage.
3. Ensuring the ongoing renderability of the significant properties of digital materials. This involves addressing challenges such as format and physical media obsolescence or changes in access platforms, and may include strategies that incorporate normalization, migration, or emulation.

Objectives
The primary objective of the Libraries’ digital preservation efforts is to preserve and make accessible over the long-term materials in support of the teaching, research, and community engagement activities of the University, as well as institutional materials with legal, administrative, and historical value. The Libraries will:

• Protect the University’s investments in digital materials through preservation activities and initiatives;

¹ In addition to this Framework document, a series of ‘Action plans’ outline specific policies, and the processes, workflows, and tools that implement those policies, for distinct content types.
• Identify, through appraisal and selection, materials to be preserved, consisting of born-digital and digitized materials;
• Comply with prevailing community standards and best practices for preservation and access;
• Observe legal compliance requirements related to retention, preservation, and access;
• Seek, expand, and develop digital preservation methods that are appropriate for the Libraries; and,
• Promote inter-institutional and other types of collaboration.

Guiding principles

Foundational principles
• Digital preservation efforts are focused on supporting the Libraries’ collection-building, archival and records management mandates, and strategic priorities.
• Long-term access to digital materials is the primary goal of digital preservation.
• Digital preservation is not a binary state where something is preserved or not. It is a property of the policies, procedures, and technologies used to manage digital materials over time that either increases or diminishes their usability.\(^3\)
• Risk identification and mitigation is a central part of digital preservation.
• The Libraries cannot and will not preserve everything in its custody, or all materials at the same level.
• Digital preservation must be technologically, organizationally, and financially feasible and sustainable.
• Where possible, technologies used for preservation will be community-based, open, and transparent.\(^4\)
• UVic Libraries is committed to collaborating within the University and with other institutions to advance the development of digital preservation capacity, share lessons learned with other organizations, and extend the breadth of our available expertise. Collaborative opportunities for digital preservation will be prioritized.

Operating principles
• Specific responsibilities for actions related to preservation should be clearly defined and decisions related to all aspect of digital preservation should be made systematically.
• Developing and maintaining thorough documentation is essential to the success of digital preservation effort. Documentation will be updated and reviewed on a regular basis and be accessible to departments and units within the Libraries, where this does not pose a security or privacy risk.

\(^3\) This principle is inspired by the work of Steve Marks, Digital Preservation Librarian at the University of Toronto Libraries.

• This document and its associated action plans must be accessible and defensible and decisions must be made in as transparent a way as possible.
• This document and its associated action plans must effectively adapt to organizational, environmental, and technological change, and be subject to a meaningful and periodic review process.
• Efforts will align with community-accepted and best practices standards where possible. Where this is not possible for specific content groups, a rationale must be documented in the action plan associated with that material.
• Each specific action plan must define testable and achievable success measures.

Challenges
There are many challenges associated with digital preservation. The Libraries efforts must especially take the following into consideration:

• Change: Technology changes rapidly in relation to content creation and access, but also in relation to preservation-related systems and services. Staying up-to-date and responding to such changes is a huge challenge.
• Sustainability: The Libraries requires sufficient resources, including designated library funding, for ongoing efforts related to the long-term stewardship of digital materials. The scope of preservation activities needs to accurately reflect the availability of resources.
• Flexibility: To respond to evolving technological capabilities and changing user expectations, the Libraries must continually revise requirements for preservation without jeopardizing the ongoing care of existing digital content.
• Content creators and partnerships: The Libraries needs to partner with content creators to facilitate preservation-friendly creation that restricts as little as possible scholarly and creative expression.

Roles and responsibilities
Digital preservation activities at the Libraries are overseen by the Digital Preservation Working Group (DPWG).

DPWG Mandate:
• Oversee the development and coordination of a Framework for digital preservation.
• Develop effective strategies for the preservation of born digital and digitized collections and holdings from the point of acquisition or creation, with a focus on materials unique to the university and/or at high risk of loss.
• Identify and promote best practices, standards, and technologies.
• Liaise with other Libraries’ Committee, Working Groups, and staff whose efforts intersect with the DPWG’s mandate and role.
• Foster digital preservation outreach and co-operation on campus.
• Review and approve relevant policies, procedures, and workflows.
• Liaise with relevant regional, national, and international initiatives and efforts.
DPWG Deliverables:
• Creating an annual plan, including specific deliverables related to current and future projects.
• Creating and maintaining updated policies.
• Reviewing and approving workflows, tools, and procedures.
• Providing workshops, giving presentations, and creating publications as required.
• In concert with the Digital Preservation Librarian, providing support as required to units across the Libraries with preservation responsibilities.

Scope and prioritizations
The Libraries are responsible for identifying and providing the means to preserve and ensure ongoing access to selected digital materials. Not all the digital content the Libraries creates or acquires will be preserved by the Libraries over the long term.

The Libraries’ preservation priorities are as follows:

<table>
<thead>
<tr>
<th>Priority</th>
<th>Description</th>
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<tbody>
<tr>
<td>High priority</td>
<td>Unique or rare locally-held born digital materials. Rigorous effort will be made to ensure preservation of selected materials, both library resources, special collections material, archival collections, and institutional records, in all formats, as is reasonable and practicable. Born-digital material held in Special Collections and University Archives, e.g. records on loose magnetic and optical media and laptop hard drives.</td>
</tr>
<tr>
<td>Medium priority</td>
<td>Unique or rare locally-held digitized materials with limited availability of analogue version. All reasonable steps will be taken to preserve materials without an analogue original, or when re-digitizing is not possible, or very limited numbers of analogue versions are available. Also included are digitized materials that have annotations or other value-added features making them difficult or impossible to recreate.</td>
</tr>
<tr>
<td>Lower priority</td>
<td>Unique locally-held digitized materials with available analogue version. Reasonable measures will be taken to extend the life of digital objects with a readily available analogue original. However, the cost of re-digitizing as needed will be weighed against the cost of preserving the existing digital objects.</td>
</tr>
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</table>

Materials where minimal preservation actions will be taken:

• Items scanned for temporary access and other miscellanea. Minimal preservation actions will be taken for ephemeral materials such as materials scanned for the Libraries’ reserves, document delivery, or related services, odds and ends and portions of text scanned from analogue collections, and content that is deemed unessential to the comprehensiveness of collections.

• Widely-available subscription and related or adjacent materials. Minimal preservation actions will be taken for commodity materials such as licensed database content and electronic journal packages, although the Libraries may
choose to support consortial and other efforts aimed at ensuring post-cancellation access and the long-term preservation of these materials.

Preservation levels for specific types of materials
This document defines a set of preservation levels that outline the basic processes and the amount of resources applied to each content group to ensure that it is accessible indefinitely. Preservation levels and access goals for each content group are described in that content group’s action plan.

<table>
<thead>
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<th>Level</th>
<th>Description</th>
<th>Access goals</th>
<th>Success measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (bit-level)</td>
<td>UVic Libraries ensures bit-level integrity of files over time.</td>
<td>Authorized users can access copies of material in the same format it was originally in when it entered the Libraries’ preservation workflows. Bit-level preservation does not ensure that files will be accessible in the same software used at time of access.</td>
<td>Checksum at time of original processing is the same as at time of future access.</td>
</tr>
<tr>
<td>2 (normalization)</td>
<td>At time of capture or ingest, UVic Libraries normalizes content into open formats, which are then preserved along with the original at preservation level 1 (bit-level). Normalization does</td>
<td>Authorized users can get a copy of the files that make up a resource in an open, non-proprietary format that was current at time of capture or ingest, with significant characteristics of the</td>
<td>The normalized versions of all files that make up a resource have checksums that are identical to ones derived at the time of normalization.</td>
</tr>
</tbody>
</table>

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5 At all four preservation levels, metadata (descriptive, structural, rights, technical, preservation) is captured along with content files, as detailed in each content group’s action plan. This metadata will support activities required by the various levels of preservation.

6 “Access goals” describe the type of activity that users of the preserved content are anticipated to be able to perform with that content in the future.

7 “Success measures” identify activities that UVic Libraries staff or external organizations can perform on a routine basis to verify that access goals as described above can be achieved.

8 “Significant characteristics” are the characteristics of a digital object that make it accessible and useful to end-users. UVic Libraries will employ the significant characteristics as defined by Archivematica.
<table>
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<th>Storage levels for specific types of materials</th>
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| 3 (migration) | UVic Libraries preserves the original files so that they can be viewed, played, or used in an appropriate manner within a computing environment that emulates the one that was current at the time the files were created. Original files are preserved at level 1 (bit-level). | Authorized users can access the resource in file formats that are current at the time of access. Files may not correspond one-to-one with the original files, but the significant characteristics of the original resource will be reasonably intact. | The migrated version of the resource retains as many of the significant characteristics of the obsolete version as is practical. Migrated versions of all files have future checksums that are identical to the ones derived at the time of migration. |

| 4 (emulation) | UVic Libraries preserves the original files so that they can be viewed, played, or used in an appropriate manner within a computing environment that emulates the one that was current at the time the files were created. Original files are preserved at level 1 (bit-level). | Authorized users can access the original files in a computing environment (via original hardware, a virtual machine, within a browser, etc.) that is similar to the one the files were designed for. Significant characteristics of the original file are unaltered or as intact as is reasonably possible. | All significant characteristics of the original files are reasonably intact, since the computing environment they are tested within in the future is reasonably identical to their original environment. Original files are renderable in a suitable emulation environment. |

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https://wiki.archivematica.org/Significant_characteristics. These represent a well-researched, community-led, operationally tenable set of characteristics.
This document defines a set of storage levels that outline the basic storage infrastructure applied to each content group to ensure that it is accessible indefinitely. Storage levels for each content group are described in that content group’s action plan.

<table>
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<tr>
<td>Level 1</td>
<td>Two complete copies that are not collocated.</td>
</tr>
<tr>
<td>Level 2</td>
<td>At least three complete copies. At least one copy in a different geographic location.</td>
</tr>
<tr>
<td>Level 3</td>
<td>At least three complete copies. At least one copy in a geographic location with a different disaster threat.</td>
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<tr>
<td>Level 4</td>
<td>At least three copies in geographic locations with different disaster threats.</td>
</tr>
</tbody>
</table>

**Review and succession criteria**

This document will be reviewed and updated as needed with a full review every two years to ensure timely revisions as technology, preservation strategies, and experience evolve. This review process will be initiated by the Digital Preservation Working.

Last updated: 2 September 2020, Corey Davis