Digital Preservation Plan

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1. Introduction

1.1 Executive Summary

Colorado State Archives is governed by *Colorado Revised Statutes* (CRS) Title 24-Article 80. CRS 24-80- 102 specifies that the Colorado State Archives (CSA) under the Department of Personnel "shall succeed to the records of all government agencies." The State Archives is the official trustee of all records transferred to its custody, regardless of format, and it provides reasonable access to those records under the Colorado Open Records Act. The State Archives, as part of the Colorado Department of Personnel and Administration is entrusted with setting policies, plans and procedures governing the management of records, and with providing for the preservation of records of long term value and permanent retention, including digital and digitized records.

1.2 Vision

Colorado State Archives operates under the mandate of providing long term preservation and access to the State's permanent records. The goal of this plan is to extend this mandate to digital/digitized records using relevant standards and best practices. The plan provides a means to continue the services of a trusted digital repository, ensuring the State's digital and digitized records are preserved and accessible in perpetuity.

1.3 Purpose

In order to fulfill its statutory mandate, CSA has developed procedures to preserve digital/digitized records created by Colorado state agencies and political subdivisions. Systematic appraisal, collection, and management of these records ensure their accessibility into the future. Updates to this plan to continue long term preservation and access to permanent digital/digitized records are imperative.

The digital preservation plan aligns with state-wide initiatives to foster transparency and accountability in state government. It also complies with Department of Personnel and Administration objectives to improve customer service and modernize business operations.

1.4 Stakeholders

Stakeholders in records creation, access and preservation include: Colorado state agencies, legislative and judicial branches, special districts, municipalities, counties, schools, and the general public.

2. Organizational Viability & Preservation Strategy

2.1 Risk assessment

A risk assessment of CSA was conducted in 2014. At the time there was, "no line item in the Archives budget that allots funds specifically to preservation or conservation. If funds for supplies and treatments are not guaranteed, available money might be otherwise allocated and important collections care projects would not be completed as necessary."

 In 2018, a line item dedicating general funds specifically for the preservation of digital/digitized records, and a digital archivist was added to the permanent budget. The amount allocated each year covers the growth of records and projected cost increases, and ensures the digital repository and one dedicated digital archivist are funded in perpetuity.

2.2 Goals and Objectives of Digital Preservation

- Preserve digital and digitized records in the custody of the Colorado State Archives
- Perform format migration for records at risk of obsolescence
- Ensure data integrity through fixity checks and data authenticity audits
- Provide access to digital records to the public

2.3 Scope

This plan addresses the identification, security, and preservation of the digital/digitized records of the government of Colorado. It provides assurance of sustainable access to these records into the future. Digital/digitized records and assets of the State are objects that have been identified as having enduring cultural, historical, informational, legal, administrative, and/or evidentiary value by CSA. Examples of digital records/assets include formats such as word processing documents, spreadsheets, audio-visual files or images, and application-specific digital assets such as email, websites, databases, and geospatial datasets.

2.4 Roles and Responsibilities

2.4.1 Colorado State Archives

1. Roles and responsibilities of CSA staff

   a. The state archivist, archivists and records managers all contribute to the oversight and management of ingested digital and digitized records.

   b. The research desk and administrative staff facilitate access to records

2. Roles and responsibilities of record creators and depositors

   a. Creators and depositors are asked to follow best practice regarding the creation and submission of their digital records to CSA.

2.5 Selection and Acquisitions

CSA actively works with government entities to set retention schedules for their records and works to ensure that appropriate records management principles are applied over the record life-cycle. Digital/digitized records recommended to have permanent value by CSA are listed in retention schedules. All requests for the

transfer of records to CSA are reviewed by an internal acquisition committee. Records eligible for transfer are further defined in the [Collections Policy](#).

2.6 Standards Compliance

2.6.1 Open Archival Information System (OAIS) reference model

Digital assets are monitored with the OAIS model, through Preservica - CSA's current digital repository. Submission Information Packages (SIPs) are generated when new assets are added to the repository from the producer of data. From this data, Archival Information Packages (AIPs) are created. AIPs are formatted to a preservation copy and are given metadata to ensure the context and data integrity is authenticated. When users are interested in accessing the data, Dissemination Information Packages (DIPs) are generated from the AIPs.

2.6.2 NDSA Levels of Digital Preservation

CSA manages its digital repository in compliance with the NDSA (National Digital Stewardship Alliance) Levels of Digital Preservation. These practices hinge on five factors and four levels at the heart of digital preservation:

Functional Area	Level			
	Level 1 (Know your content)	Level 2 (Protect your content)	Level 3 (Monitor your content)	Level 4 (Sustain your content)
Storage	Have two complete copies in separate locations Document all storage media where content is stored Put content into stable storage	Have three complete copies with at least one copy in a separate geographic location Document storage and storage media indicating the resources and dependencies they require to function	Have at least one copy in a geographic location with a different disaster threat than the other copies Have at least one copy on a different storage media type Track the obsolescence of storage and media	Have at least three copies in geographic locations, each with a different disaster threat Maximize storage diversification to avoid single points of failure Have a plan and execute actions to address obsolescence of storage hardware, software, and media
Integrity	Verify integrity information if it has been provided with the content Generate integrity information if not provided with the content Virus check all content; isolate content for quarantine as needed	Verify integrity information when moving or copying content Use write-blockers when working with original media Back up integrity information and store copy in a separate location from the content	Verify integrity information of content at fixed intervals Document integrity information verification processes and outcomes Perform audit of integrity information on demand	Verify integrity information in response to specific events or activities Replace or repair corrupted content as necessary
Control	Determine the human and software agents that should be authorized to read, write, move, and delete content	Document the human and software agents authorized to read, write, move, and delete content and apply these	Maintain logs and identify the human and software agents that performed actions on content	Perform periodic review of actions/access logs
Metadata	Create inventory of content, also documenting current storage locations Backup inventory and store at least one copy separately from content	Store enough metadata to know what the content is (this might include some combination of administrative, technical, descriptive, preservation, and structural)	Determine what metadata standards to apply Find and fill gaps in your metadata to meet those standards	Record preservation actions associated with content and when those actions occur Implement metadata standards chosen
Content	Document file formats and other essential content characteristics including how and when these were identified	Verify file formats and other essential content characteristics Build relationships with content creators to encourage sustainable file choices	Monitor for obsolescence, and changes in technologies on which content is dependent	Perform migrations, normalizations, emulation, and similar activities that ensure content can be accessed

As it currently stands, the Colorado State Archives has a long term contract with Preservica, a vendor with capabilities for level four across all five factors. (https://ndsa.org/publications/levels-of-digital-preservation/)

While Preservica has the capabilities for level four preservation, it is important to recognize that all digital collections in the custody of CSA are not necessarily ingested into Preservica at this time and exist on internal servers. Priority has been given to collections without analog surrogates, legislative audio-visual files, and digitized collections that are frequently requested by researchers. The digital archivist continues to work towards ingesting all digital assets into the repository in order to meet NDSA recommendations.

2.7 Access and Use

Users requesting access to digital records are provided with an access copy generated from the master archival copy. User access to the master archival copies of records is restricted to internal staff.

At this time, digital records are made available by individual inquiry and via the CSA reference desk. Reference archivists work with the digital archivist to obtain access copies of requested records. Researchers receiving the access copies are expected to adhere to CSA's Access Policy.

2.8 Incentives and Challenges

2.8.1 Growth and sustainability

With ever evolving technology and challenges relating to digital preservation, CSA and the digital preservation team will periodically review this plan and internal procedures to ensure they comply with best practices. Funding for the digital preservation program is permanent through the State's general fund and allows for increases every year. The funding increase covers additional storage costs, upgrades, staff training and digital preservation projects.

2.8.2 Partnerships

Collaboration with state and local government entities is welcomed and encouraged to ensure the proper transfer and deposit of digital records. Preservica allows for contributors to transfer files and associated metadata to the database, which are verified by the digital archivist before ingestion into the system.

2.8.3 Preservation

Colorado State Archives has important legal and historical records in digital format. CSA's digital repository is through Preservica, which currently meets all digital preservation standards as set by the International Standards Organization (ISO) 14721 and 16363.

2.8.4 Education

Due to the evolving nature of digital record preservation and access, staff are encouraged to stay current on best practices through continuing education seminars, workshops and conferences. Additionally, Preservica frequently supplies training to staff on new preservation functions and upgrades to their system.

3. Financial

In 2018 a permanent line item was added to CSA's budget to fund digital preservation, digitization services, in-house digitization hardware and software, and one permanent digital archivist. The original general fund request was for $372,335 and it has increased yearly based on need.

4. Implementation

4.1 Operating and Technical Principles

The Colorado State Archives digital preservation plan has been developed and adheres to digital preservation best practice and relevant digital preservation standards. The plan is compliant with ISO standards 14721 (Open Archival Information System reference model) and 16363 (Trusted Digital Repository Standard for preservation). Additionally the plan supports Colorado statutes, including the Uniform Electronic Transactions Act (CRS 24-71.3-101-121) and the Colorado Open Records Act (CRS 24-72-201-206).

4.2 Communication

Internal and external communication of preservation plan implementation will be the responsibility of the digital preservation team with support from the state archivist.

4.3 Review

The plan will be reviewed two years (or as needed) from the effective date by the state archivist and digital preservation team.

4.4 Digital Storage

State Archives has a long term contract (expiring in 2034) with Preservica to manage digital assets designated for preservation. Once assets are deposited into Preservica, the database performs daily integrity checks utilizing the SHA-256 checksum to monitor authenticity. Preservica allows for file format migrations to prevent file obsolescence. Preservica provides technical assistance and training to CSA staff on new functions of the system. Should the contract not be renewed, assets and associated metadata will be safely extracted from Preservica and deposited into another system meeting preservation standards.

4.5 Metadata

Capturing and preserving metadata (preservation, descriptive, structural, administrative, technical, legal) is a key component in preserving digital resources. The digital archivist utilizes Preservica to capture and retain this information down to the item level.

4.6 Digitization

Digitization projects of analog records are a constant part of the digital preservation plan at CSA. Projects are prioritized by frequency of access requests and risk of deterioration or obsolescence. All digitization is done in accordance with best practice recommendations for preservation file formats set by the Library of Congress (LOC), https://www.loc.gov/preservation/resources/rfs/format-pref-summary.html

4.7 System Security

CSA works in partnership with the Office of Information Technology (OIT) to address preservation system security. Preservica has three digital storage locations throughout the United States on different power grids, and has worked with OIT to satisfy security requirements set by the State.

5.Procedures

The digital archivist frequently documents internal procedures for all stages of digital preservation. This includes but is not limited to digitization projects, contributor deposits, ingests into the digital repository, audits, checking of integrity reports, making access copies and general data management.

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