2013-2015

North Carolina Department of Cultural Resources Digital Preservation Plan
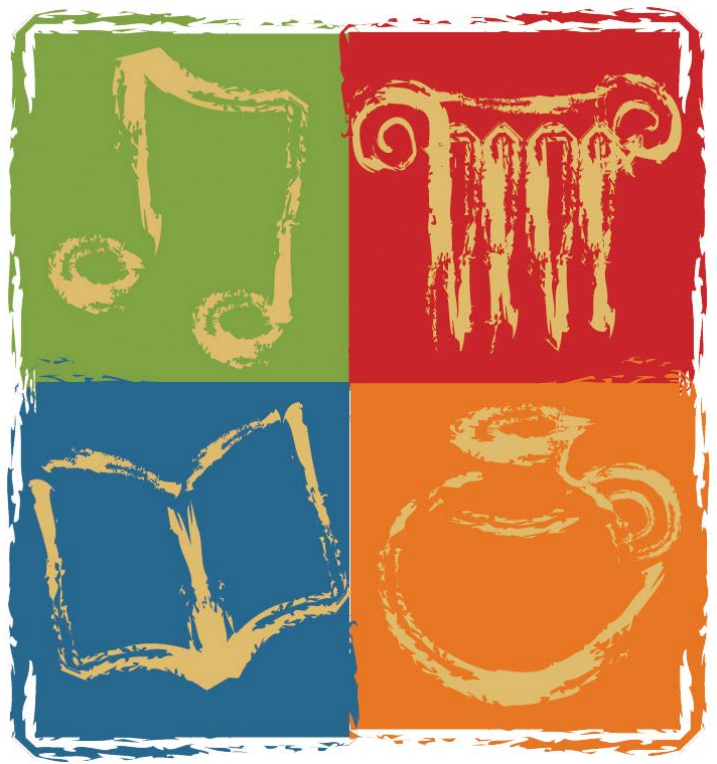
State Archives of North Carolina
State Library of North Carolina

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1   EXECUTIVE SUMMARY

 The State Archives of North Carolina and the State Library of North Carolina have made progress acquiring and preserving content from state agency and local government personnel as well as educating government employees about preserving digital records. Now is the time to plan next steps to accomplish the goals required by our legislative mandates.[1] This digital preservation plan outlines these steps.

1. Seek Executive Agency collaboration for digital preservation initiatives and activities,
2. Investigate and implement integrated solutions for full digital preservation management program, and
3. Extend current efforts into unified programs for educating state and local government data creators and managers about how they can assist the State Archives and State Library in meeting their digital preservation goals.

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[1] Three statutes provide the mandate for Cultural Resources' digital preservation program: N.C. Gen. State § 132, *North Carolina Public Records Laws*; N.C. Gen. Stat. § 121, *Archives and History*; and N.C. Gen. Stat. § 125, *State Library Agency*.

2 INTRODUCTION

Digital preservation is the management of digital information to allow for access over time. This information must be deemed authentic and trustworthy. This Digital Preservation Plan builds on the Department of Cultural Resources' (Cultural Resources) Digital Preservation Policy Framework[2] and outlines the steps Cultural Resources will take to ensure ready and permanent public access to born-digital and digitized publications and records produced by (or on behalf of) North Carolina state and local government.

Two sections of Cultural Resources undertake digital preservation initiatives: the State Archives of North Carolina and the State Library of North Carolina (State Archives and State Library). This plan supplements existing policies, guidelines, procedures, and agreements addressing the management of digital resources.

2.1 Current Environment

In today's rapidly changing digital environment, digital content is jeopardized by events ranging from user error to sweeping industry changes. Whereas print materials can often reside on a shelf for years before they need maintenance, digital materials require constant care to ensure that data survives in a legible format whose evidential value is intact. Archives and Libraries have led the way in developing and testing preservation systems, standards, and best practices. However, at this writing, no one system reliably preserves digital objects regardless of their format. Current trends are toward geographically distributed storage and access models, as well as open-source and/or platform-independent solutions. State Archives and State Library digital preservation specialists in Cultural Resources are monitoring these trends and focusing on solutions that address North Carolina government's specific risks, needs, and priorities.

Digital content is present in every aspect of state and local government. It includes both informational content (publications, communications, datasets, etc.), administrative content (employment data, financial data, policy-making data, etc.), and evidential content (information about the origins, functions, and activities of the creator). Not only is the use of this information vital to state government today, but long-term preservation of and access to this data is required to ensure administrative integrity, information authenticity, government transparency, and legislative compliance. Challenges associated with preserving North Carolina's digital state government information are widely acknowledged and documented.[3]

Traditionally, the responsibility for collecting and managing government information has been divided between the State Archives and State Library, depending on whether information was

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[2] North Carolina Department of Cultural Resources. *Digital Preservation Policy Framework*, September, 2005. http://digitalpreservation.ncdcr.gov/asgii/publications/policy_framework.pdf

[3] Martin, K. and Reagan, J. *North Carolina State Government Information: Realities and Possibilities.* State Library of North Carolina, Raleigh, NC, November, 2003. http://digitalpreservation.ncdcr.gov/asgii/Workgroup/WhitePaper.pdf; Martin, K. *Moving Into the Digital Age: A Conceptual Model for a Publications Repository.* Internet Reference Services Quarterly, Volume 11, Issue 2 September, 2006, pp. 27-47.; Martin, K. and Eubank, K. *The North Carolina State Government Website Archives: A Case Study of an American Government Web Archiving Project.* Hypermedia and Multimedia, Volume 13, Issue 1, January 2007.; Eubank, K., Ricker, J., and Rudersdorf, A. *Pathways to Preservation: Digital Curation Strategies in North Carolina State Government.* Proceedings of the 2009 DigCCurr Conference, Chapel Hill, N.C., April 2009. http://digitalpreservation.ncdcr.gov/asgii/presentations/DigCCurr2009.pdf

created as part of the internal workings of state or local agencies or disseminated to the general public as a publication. In the digital environment, the boundaries between publications and records and internal and public have narrowed; conversely, the roles and expertise needed to address these new challenges have expanded.

Since the Secretary's approval of the Digital Preservation Policy Framework in 2005, staff from the State Archives and State Library have collaborated to facilitate the transition from a paper-based to an e-government environment and integrate digital preservation into existing Cultural Resources programs with only limited effect on existing services. These important activities have been achieved without a formal preservation plan in place. At this point, formalized administrative support, pooled resources, and a singular set of goals are critical to grow "projects" into an integrated "program." State Archives' and State Library's unified initiatives -- as they relate to digitization and digital collections access -- have been a boon to our users and a resource savings to our divisions. Consequently, we are proposing this plan to bring together our vision and resources for digital preservation, as well.

2.2 Collections

Cultural Resources is the department statutorily responsible for preserving North Carolina's state and local records, state publications, and history. The digital collections preserved by the State Archives and State Library include millions of electronic mail, geospatial data, websites, publication, audio, video, database, image, and document files, as well as their associated metadata. Because much of what agencies produce today is born in the digital environment (or "born digital"), the State Archives' and State Library's technical capabilities must evolve in order to acquire and maintain this digital content.

2.3 Risk Assessment

While digital media and paper are both susceptible to the same environmental risks (fire, human error, etc.), there are unique risks to digital content that cause data loss. These risks include, but are not limited to:

- power surges and outages,
- security breaches,
- obsolete media,
- media failures,
- network failures,
- hard-drive crashes,
- legacy software failures,
- failed backups,

- employee errors and manipulations,
- lack of funding to continue storage and preservation activities,
- failure to receive or capture the material for preservation, and
- irreversible decisions made at the time the content was created.

Many of these risks can be minimized with careful system design as well as data creation and storage standards. For instance, risks listed in the left-hand column can be minimized by the use of

a distributed, redundant, self-monitoring, networked storage system with access controls.[4] Risks in the right-hand column can be minimized through education of data creators, managers, and users. A well-crafted digital preservation program addresses ways to minimize these risks. Like the challenge of ever changing world of digital preservation, this is an evolving document. Staff from the Archives and Library will continue to investigate and monitor the dynamic technology landscape in order to best serve the people of North Carolina.

3   GOALS

The State Archives and State Library have made significant progress acquiring content from state agency personnel and making it publicly accessible through outsourcing the hosting of access databases and the preservation of digital content. Together, the State Archives and State Library have initiated a web harvesting service to capture digital state agency content posted to the Internet, which can be publicly accessed through the North Carolina State Government Web Site Archives.[5] Some state publications and records are discoverable through the State Archives' and State Library's digital repository and catalogs.[6] They have also developed projects and workshops to begin to educate the thousands of government employees creating millions of documents and records in electronic formats.[7]

Still, the State Archives and State Library are by no means acquiring all of the content created by agencies and have no unified approach to instructing agency personnel on their roles and responsibilities to enable the fulfillment of legal responsibilities. Cultural Resources must standardize its policies and provide a single access point for agencies to submit content.

In order to establish an effective and efficient program and fulfill its legislative mandates, Cultural Resources must undertake the following goals and action items.

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[4] Rosenthaler, Lukas, et al. *DISTARNET – A Distributed Archival network*, February, 2004. http://www.distarnet.ch/IS_T-distarnet.pdf and Wylie, Jay J., et. al. *Survivable Information Storage Systems*, August, 2000. http://www.pdl.cmu.edu/PDL-FTP/Storage/PASIS.pdf

[5] The North Carolina State Government Web Site Archives can be found at http://webarchives.ncdcr.gov/.

[6] The North Carolina Digital Collections, the digital repository of the A&L, can be found at http://digital.ncdcr.gov. The State Library's catalog can be found at http://go.dcr.state.nc.us/. The North Carolina State Archives' catalog can be found at http://mars.archives.ncdcr.gov.

[7] See "Digital Preservation Education for NC State Government Employees." http://digitalpreservation.ncdcr.gov/.

Goal 1: Seek Executive Agency collaboration for digital preservation initiatives and activities.

Digital preservation is by necessity a partnership of digital information creators, Chief Records Officers, information technology systems staff, legal experts, and archives and library professionals. To foster a partnership amongst such stakeholders, NCDCR will convene the Electronic Government Information Stewardship Committee (EGIS). The committee will consist of individuals with diverse viewpoints and interests (legal, information technology, records management), from North Carolina's Executive Agencies, and will foster collaboration, offer feedback to DCR as it develops policy and guidance documents. Led by archives and library professionals, this group will also solidify Cultural Resources' leadership role through G.S. §132, §121, and G.S. §125 to promulgate policies and requirement documents regarding digital preservation.

Goal 2: Investigate and implement integrated solutions for full digital preservation management program.

Like archives and libraries communities across the globe working in the still unformed world of digital preservation, Cultural Resources' State Archives and State Library staff have spent years researching, testing, and developing management systems and best practices. As these digital preservation technologies and standards mature, so do the options for a comprehensive, trustworthy, preservation management system. Consequently, Cultural Resources should proactively prepare for this.

Goal 3: Extend current efforts into unified programs for educating state and local government data creators and managers about how they can assist the State Archives and State Library in meeting their digital preservation goals.

Education of content creators and data stewards is key to the success of digital preservation planning. Cultural Resources has offered training to agency employees for many years. State Archives and State Library staff must create a unified educational program to communicate best practices for creating and managing digital assets to state and local employees with a single voice.

4 ACTION ITEMS

Goal 1: Responsibility – State Archivist

Item 1: Convene Electronic Government Information Stewardship Committee.
Members recruited from each of the following areas: digital information creators, Chief Records Officers, information technology systems staff, legal experts, and archives and library professionals.
Members recruited, and first meeting held by January 2014.

Goal 2: Responsibility – Head, Digital Services Section, State Archives of NC

Item 1: Identify and document Cultural Resources' preservation strategies and requirements for a full digital preservation management system.
Requirements document should be completed no later than December 2013.

Item 2: Investigate systems to determine technologies that comply with ISO standards 14721 and 16363.
Funding – The State Archives and State Library will develop a plan to support the digital preservation program outlined in goal 2.
Evaluation of the proposed tool(s) and services will be prepared by June 2014. This action item must be revisited biannually, due to technology advances and refresh requirements.

Item 3: Implement digital preservation program based on findings from Items 1 & 2.
Funding – Includes technology, management strategies, and funding plans.
Evaluation of the proposed tool(s) and services will begin in January 2015 and will be ongoing as required.

Goal 3: Responsibility – Director, Digital Information Management Program, State Library of NC

Item 1: Identify Archives and Library digital preservation common objectives and deliver coordinated outreach portal on Cultural Resources website.
Staff will assess current agency priorities, workshops, and educational materials with an eye toward assimilating these into a Cultural Resources-wide effort.
Assessment and suggested outcomes by April 2014, followed by ongoing updates.

Item 2: Determine critical policies and procedures related to data creation, storage, management, and transfer of digital information. Also, determine critical policies and procedures needed to govern digital preservation management.
A prioritized list of policies and procedures to create or modify will be prepared by December 2013.

Item 3: Use Cultural Resources policies to create and/or update North Carolina government best practices guidelines related to digital data creation, storage/management, and transfer.
After Goal 3, Item 2 is complete, a prioritized list of guidelines will be created.
This effort will be implemented in January 2014 and will be ongoing as required.

5   CONCLUSION AND NEXT STEPS

A successful digital preservation program means starting today to work toward the implementation of secure, distributed, infrastructure-independent, preservation-ready storage and access systems in conjunction with well-defined standards, guidelines, and procedures for digital information creation and management, reinforced with a strong education program for content creators and managers across all agencies of state government. Approval of this plan is a vital next step in solidifying the department's responsibility toward North Carolina's digital cultural heritage and in providing the State Archives and State Library with direction and support to programatize their preservation responsibilities.

Appendix 1: Action Items Timeline

2013												2014												2015											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

1.1: Recruit, draft bylaws, and hold first EGIS committee meeting (Jul 2013 – Jan 2014)

2.1: Identify and document Cultural Resources' preservation strategies and requirements for a full digital preservation management system (Jul 2013 – Jan 2014)

2.2: Investigate systems to determine technologies that comply with ISO standards 14721 and 16363 (Jul 2013 – Oct 2014)

2.3: Implement digital preservation program based on findings from 2.1 & 2.2 (Jul 2013 – Dec 2014, extending into 2015)

3.1: Deliver coordinated digital preservation outreach portal on Cultural Resources website (Jan 2013 – Apr 2013)

3.2: Determine critical policies and procedures related to data creation, storage, management, and transfer of digital information (Jul 2013 – Jan 2014)

3.3: Use Cultural Resources policies to create and/or update North Carolina government best practices guidelines related to digital data creation, storage/management, and transfer (Jul 2014 – Jan 2015, extending into 2015)

Appendix 2: Terms & Concepts

Many of the definitions of the terms and concepts provided here were taken from numerous sources, either in part or in whole. These resources included Cornell's Digital Preservation Management tutorial, the Digital Preservation Coalition website, PCMagazine, Trusted Digital Repositories *(2002), Wikipedia, Yale University, and the ZDNet website.*

Access - the ability, permission (right) and means to locate, display, obtain, determine availability of or make use of a digital resource, or information about that resource.

ASGII – the **Access to State Government Information Initiative** is an LSTA-funded statewide leadership grant administered by the State Library's Digital Information Management Program (see http://digitalpreservation.ncdcr.gov/asgii/).

Born digital – information created in electronic format. Born-digital information is distinguished from information that was created in another format and digitized through scanning or digital photography, creating a digital surrogate. A document created using a word processor may be described as born-digital.

Data transfer – the action of physically moving digital content from one location to another. This can occur in physical space (as with files on a CD-ROM) or on the Internet (as with the transmission of digital content from one server to another).

Digital content - a broad term encompassing electronic files that are "born digital" (created using computers or other electronic devices) or that were "digitized" (created as a result of converting analog materials to digital form).

Digital preservation – (1) a series of managed activities necessary to ensure continued access to digital materials for as long as they are needed; (2) the management of digital information to allow for access to authentic copies over time.

Distributed storage - multiple computers or geographically dispersed computers used to store multiple copies of digital content to ensure digital content will survive if one computer (or one copy of a file) is physically damaged (as by fire or flooding).

ISO 14721--specifies a reference model for an open archival information system (OAIS). This reference model addresses a full range of archival information preservation functions including ingest, archival storage, data management, access, and dissemination. It also addresses the migration of digital information to new media and forms, the data models used to represent the information, the role of software in information preservation, and the exchange of digital information among archives. It identifies both internal and external interfaces to the archive functions, and it identifies a number of high-level services at these interfaces.

ISO 16363--defines a recommended practice for assessing the trustworthiness of digital repositories. It is applicable to the entire range of digital repositories. ISO 16363:2012 can be used as a basis for certification.

Networked storage – otherwise known as a storage area network (SAN), networked storage attaches remote computing devices like tape libraries to servers so that they appear to be local.

Open source - of or relating to or being computer software for which the source code is freely available.

Preservation management – the active administration of digital content at each stage of its life-cycle, and the recognition of the inter-dependencies between each stage, and the commencement of preservation activities as early as practicable.

Self-monitoring – a computer's capacity to perform automated, scheduled tests for and detections of changes to digital files.

Single point of access – a single search engine or database from which all digital content hosted by an institution can be retrieved and viewed.