Digital Preservation Assessment Report

Rhode Island College
Providence, Rhode Island
May 21, 2024

NEDCC
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This report is based on materials produced by NEDCC and LYRASIS with the support of the National Endowment for the Humanities.

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EXECUTIVE SUMMARY

On May 21, 2024, the digital collections at the Special Collections department at the James P. Adams Library at Rhode Island College (the Library) were assessed for planning purposes by Sam Meister, a consultant representing the Northeast Document Conservation Center. The goals of the assessment were to document the state of digital preservation at the Library, identify challenges and opportunities for improvement, and make recommendations for preserving the Library's unique digital collections. Observations and recommendations are based on a pre-visit questionnaire, a full-day site visit, and discussions with Veronica Denison, (Assistant Professor / Digital Archivist and Special Collections Librarian), Andrew Davis (Digital Initiatives / Technical Operations Coordinator), Carissa DeLizio (Adams Library Director), Kieran Ayton (Electronic Resources and Technology Librarian), Val Endress (Chair of Council), Jeanette St. Pierre (Executive Director of External Relations and Communications), Justin Wilder (Assistant Director of Communications and Photography), and Gene St Pierre (Photographer).

For over 10 years, the Library has digitized photographs, documents, audio reels, audio cassettes, and video in a variety of formats. Many of these audiovisual materials include oral histories, lectures on campus, and television programs. Born-digital materials have increasingly been acquired by the Library in recent years including student scholarship, faculty publications, photographs, documents, audio, and video files. Significant efforts have been made by a core staff team to develop policies, workflows, and local technical infrastructure to manage and preserve digital materials, and there is now an opportunity to build on these previous efforts to develop and implement a sustainable digital preservation program at the Library.

A number of activities that support the preservation of digital collections are currently underway and should be continued. These include:

- Implementing standards-based digitization activities to create preservation-ready digital objects
- Developing and implementing foundational collections management and digital preservation policies
- Establishing and maintaining local storage infrastructure for digital collections

As the Library continues to grow its digital collections and further develop its strategies to preserve them, it faces several challenges, including:

- Lack of staff capacity to coordinate and implement policies, processes, and infrastructure to support the creation, acquisition, management, and preservation of digital collections
- Lack of policy guidance and procedures related to the creation, acquisition, management, and preservation of digitized and born-digital materials
- Lack of key digital preservation technical infrastructure elements, including an implemented preservation storage solution

With these challenges in mind, efforts over the next 1-2 years should focus on:

- Investing in additional staffing support to allow the core staff team to coordinate the continued development of a digital preservation program
- Developing core digital preservation policies, including a Digital Preservation Plan

- Creating procedures and documenting workflows for digitization and the acquisition of born-digital materials
- Selecting and implementing an offsite preservation storage solution

In the long-term, efforts over the next 3-5 years should focus on:

- Engaging with key College stakeholders to establish a local records retention policy and schedule

Additional recommendations for procedural and strategic activities are made throughout this report.

I am glad to have had the opportunity to work with the Library on this project. It was a pleasure to spend time with the staff and to learn about the various collections, and I look forward to assisting Library with other initiatives. If this report has raised any questions, or if I can provide any additional information, please do not hesitate to contact me.

Respectfully submitted,

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INTRODUCTION

A. Institutional Profile

Rhode Island College (RIC), the first public institution of higher education in the state of Rhode Island, originated from the Rhode Island Normal School, which opened its doors on May 29, 1854. The eighth normal school opened in America, its goal was to provide teacher preparation to young people from Rhode Island. With an enrollment predominantly from Rhode Island and nearby Massachusetts and Connecticut, the institution historically has served as a "College of Opportunity" for first-generation college students.

The Special Collections department at the James P. Adams Library was established in 1974, and contain papers, photographs, moving images, audio, and other types of documentation (including electronic records) from individuals, organizations, and businesses in Rhode Island, with emphasis on those with a relationship to Rhode Island College and the cultural heritage of Rhode Island, including the Rhode Island Cape Verdean Community and Portuguese-Americans. Topics include education, cultural heritage, and socio-political materials. The department also maintains a College Archives collection that includes non-current records of RIC and its predecessor agencies, faculty papers and publications, student theses and dissertations, and other College-related materials. This collection documents the internal life and culture of the College community.

Digital Collections

The Digital Initiatives Unit was established in 2009 when the Library created an institutional repository on the BePress Digital Commons platform. In 2019, the Digital Initiatives Unit was moved under the Special Collections department. For over 10 years, the Library has digitized photographs, documents, audio reels, audio cassettes, and video in a variety of formats. Many of these audiovisual materials include oral histories, lectures on campus, and television programs. Born-digital materials have increasingly been acquired in recent years including student scholarship, faculty publications, photographs, documents, audio, and video files. Developments and activities such as these make an assessment of digital preservation infrastructure, staff capacity, and practices timely and appropriate for the Library as it continues to develop its collection management and stewardship practices.

B. The Digital Preservation Assessment

Definitions

For the purposes of this report, digital preservation is defined as follows: “the series of managed activities necessary to ensure continued access to digital materials for as long as necessary”[1] Digital preservation is necessary because the digital files cultural heritage institutions create, acquire, and keep face a variety of risks. If left alone, they are not likely to survive intact into the future. Digital preservation practices can be implemented to ensure successful stewardship of digital content and collections. Doing so allows institutions to document and care for their digital materials, while providing enduring access to our collective digital heritage. For more information about the risks to digital collections and the benefits of a digital preservation program, see Appendix C: *Why Digital Preservation?*.

[1] Digital Preservation, Digital Preservation Handbook Glossary, Digital Preservation Coalition, https://www.dpconline.org/handbook/glossary#D

Throughout the report, the word “staff” is used to indicate anyone responsible for collections care, whether they be professional staff, interns, volunteers, or some combination thereof.

Process

The goals of the assessment were to document the state of digital preservation at the Special Collections department at the James P. Adams Library, identify challenges and opportunities for improvement, and make recommendations for preserving the Library’s unique digital collections. The following report is based on a pre-visit questionnaire, meetings with digital preservation stakeholders during the visit, and follow-up correspondence with the following library staff:

- Veronica Denison, Assistant Professor/Digital Archivist and Special Collections Librarian
- Andrew Davis, Digital Initiatives / Technical Operations Coordinator
- Carissa DeLizio (Adams Library Director)
- Kieran Ayton (Electronic Resources and Technology Librarian)
- Val Endress (Chair of Council)
- Jeanette St. Pierre (Executive Director of External Relations and Communications)
- Justin Wilder (Assistant Director of Communications and Photography)
- Gene St Pierre (Photographer)

The objectives of the Digital Preservation Assessment are to:

- Assess current institutional policies and procedures as they apply to digital preservation;
- Evaluate roles and responsibilities of staff affecting digital preservation;
- Evaluate technical infrastructure for digital collections management and preservation;
- Understand current workflows and practices for creating, acquiring, preserving, and providing access to digital materials

Report

This report is intended for continuing reference by this institution and its staff. Each section includes observations and recommendations. Recommendations are italicized and in bold type, and may include a list of Steps outlining suggested implementation actions as well as Resources that provide additional guidance, examples, and models to assist Museum staff in moving forward with recommendations. Staff members are likely to change over time, but this report can be used for several years as a roadmap to priorities and as a foundation on which to build a digital preservation program. Over time, as digital collections evolve and preservation projects are accomplished, another assessment may be needed to identify new priorities.

I. THE ORGANIZATION

A. Mission Statement

As with all programs and services, creating an effective and sustainable digital preservation program begins with reviewing the mission of the organization. It is not a foregone conclusion that a collecting institution will commit to preservation as a central function; naming this commitment in a mission statement and other guiding documents is the best way to ensure the future of the collections no matter their format.

Observations & Recommendations

The current Library Mission, Values, and Vision documents don't include explicit statements addressing preservation, but they do include broad language describing a framework of support for preservation activities. In particular the "accessible and enduring research collections" language within the Vision statement and the User-centered, Connectedness and collaboration, and Sustainability value statements all provide a broad context of support for digital preservation activities.

1. ***Define and document how digital preservation goals and activities are aligned with the organization mission, values, and vision***

The Library is in the early stages of developing the foundation of a program to preserve and ensure continued access to its valuable digital collections. It's clear there is some awareness of the value of digital collections amongst staff and leadership in the Library and other College units, but significant effort will be needed to build a strong case for the ongoing investment of resources that will be needed to support a sustainable digital preservation program. Defining and documenting how the goals of the digital preservation program support the Library's broader mission, programs, and ongoing operations may take some time, but it is an essential initial activity. This will help to communicate the value of digital preservation to institutional leadership and help to strengthen the case that digital preservation should be seen as a core organizational program.

As the digital preservation program evolves, any new goals that are developed should also be aligned with the organization's mission. This activity of documenting and aligning goals should be one of the initial activities undertaken by the core digital preservation team. This documentation could be included as part of a future version of a digital preservation plan or potentially as a supplemental element of a future version of the organization's strategic plan. Alignment of digital preservation with the organization mission and strategic directions is a key element of an overall approach to developing a business case for digital preservation.

Resources
DPC - Digital Preservation Business Case Toolkit
DPC - Policy Template - Strategy Alignment
UNT Libraries' Digital Preservation Policy Framework - Purpose

B. Organizational Structure

Creating and caring for digital materials and collections over time poses significant challenges and requires a commitment across departments and in all levels of the organization. Having an organizational home for strategic direction is a key first step towards responsible stewardship of digital materials.

An authoritative body that can prioritize and achieve short- and medium-term goals is important for any organization-wide program; however, the special challenges posed by digital preservation make having a centralized decision-making group even more important. The inherent interdisciplinary approach required—involving input from every group of stakeholders, from IT services to end-users—and the multi-level decision making that underpins launching and managing a new program makes isolated efforts unsustainable.

Observations & Recommendations

The Library is currently structured into multiple units based on functional areas including; Electronic Resources & Technology, Access Services, Library Acquisitions, Special Collections, Reference, and Technical Services. With less than 20 full-time staff members, the Library utilizes student workers to assist in carrying out many core activities and services. Responsibility for digital preservation is built into the two staff positions that make up the Special Collections department. The Digital Archivist and Special Collections Librarian and Digital Initiatives / Technical Operations Coordinator are the primary staff members that have worked to plan, develop, and implement digital preservation policies, workflows, and local technical infrastructure. There has been limited engagement and participation in these efforts from other Library staff members, or from the larger College community of faculty, staff, and students.

1. Maintain and formalize current core digital preservation team structure

A formal group should be created to lead and coordinate the efforts to establish, develop, and implement a sustainable digital preservation program. In recognition of the current Library structure and resources, initially this group should continue to be made up of the two Special Collections department staff members, but steps should be taken to formally define the digital preservation team. This formalization process should entail articulating and documenting the purpose, function, goals, and decision-making responsibilities of the group. This group should conduct high level planning discussions, produce recommendations related to policies, workflows, and infrastructure, and monitor progress on the implementation of a digital preservation program. Communication and updates on group activities and progress towards achieving goals should be regularly shared with other Library staff members so that there is increased awareness and understanding of digital preservation activities.

The establishment of a formal digital preservation team is a fundamental action to initiate, coordinate, and sustain the early development activities of a digital preservation program at the Library. Almost all other recommended activities in this report are connected to this initial action, and without such a group it will be very challenging to make continued progress in a digital preservation endeavor.

Steps

- Formalize the creation of a core digital preservation team by documenting the purpose, goals, and responsibilities of the group
- Determine team meeting and communication frequency
- Utilize additional recommendations in this report as a framework to guide initial team activities

Resources

Better Together: A Holistic Approach to Creating a Digital Preservation Policy in an Art Museum
UTSA Libraries and Museums Digital Preservation Framework: Appendix C Digital Stewardship Governance Group
DPC Competency Framework

2. ***Expand digital preservation governance group when ready to engage with other campus stakeholders***

The initial priorities for a core digital preservation team should be establishing and improving internal Library policies, procedures, and technical infrastructure. After progress has been made in these areas, the Library should consider and explore opportunities for engaging with the larger College community in discussions and potential collaborations related to digital preservation and digital collections. These efforts could also entail expanding the membership of a digital preservation governance group to include faculty, staff, or even student representatives from the larger College community.

C. Designated Community

The concept of the Designated Community was developed and refined in the OAIS reference model and has become an important facet of planning for preservation, whether of digital or physical collections.[2] Drafting a Designated Community Statement that describes users by their knowledge, interest, location, demographics, or other characteristics provides an underpinning for collection management, selection, and access decisions and supports a consistent approach to resolving new problems as they arise. Knowing whom an institution serves is just as important as knowing what objects and programs it manages for its users.

Observations & Recommendations

Special Collections staff currently have a solid high-level understanding of the audiences that are seeking to find and use Special Collections materials, including digital collections. Not surprisingly most of these users consist of faculty, staff, and students from the Rhode Island College community. Statistical reports from the Digital Commons institutional repository indicate that download and use of digital collections, including materials digitized from Special Collections, have continued to increase over time. Site visit discussions with key campus stakeholders, including College Council leadership and staff from the Communications department, also illustrated an interest and need for guidance and support from the Library in managing digital assets that are regularly being created in RIC departments and administrative units This high-level understanding of users provides a foundation for future planning, but there is an opportunity to engage in a more intentional effort to gather more detailed information about audiences and what they need in relation to digital collections.

1. ***Conduct an information gathering project with audiences to learn more about their needs related to digital collections***

Continued access and use are primary drivers for digital preservation efforts. Understanding the specific needs of high priority audiences and users is key to developing a digital preservation strategy that is customized for those audiences. It's clear that RIC faculty, staff, and students are the priority audience for Library digital collections, and there is preliminary understanding about their needs related to access and use of these materials. This baseline understanding should be strengthened by planning and carrying out a comprehensive project to collect more detailed information about these audiences and what they need in relation to digital collections. This activity will likely require significant staff time and resources, so it is recommended that this type of campus engagement take place after progress is made on other internal focus recommendations, such as policy development and technical infrastructure implementation. A

[2] *ISO 14721:2012 Space data and information transfer systems -- Open archival information system (OAIS) -- Reference model*, International Organization for Standardization, https://www.iso.org/standard/57284.html

combination of methods could be used to collect information and engage with audiences, including surveys, interviews, and focus groups. The collected data should then be used to create profiles for audiences to characterize their current workflows, needs, and pain points. These audience profiles should then be used to inform planning and decision-making related to the continued development of a digital preservation program including future digitization activities, metadata creation and management, and access systems and platforms.

Steps

- Determine methods that will be used to collect information from internal staff members
- Collect information via surveys, interview, and focus groups
- Summarize and analyze collected information
- Draft audience profiles based on collected information

Resources
Project Electron: User Stories and Personas
Understanding User Needs

II. STAFF AND RESOURCES

A. Staffing and Roles

Digital preservation doesn't happen without people. Staff, the people doing the work of digital preservation, are arguably the most important resource that an organization needs to invest in to be successful in their digital preservation endeavors. A sustainable digital preservation program requires staff to perform digital preservation activities as a part of their everyday work. In practical terms, this means formalizing those obligations in staff job descriptions and work plans, as well as giving adequate time to do this work and implement inevitable changes.

It is common for staff at a variety of types of institutions to adopt digital preservation activities in an ad hoc manner as digital collections grow, both leaving gaps as well as creating areas of overlap. At times it can be difficult to determine whether certain responsibilities should be managed by collections staff or IT services. Centralizing core responsibilities for digital preservation in a single dedicated digital preservation manager is one approach to consider when determining an appropriate staffing strategy. This approach clarifies who in the organization is primarily responsible for leading digital preservation efforts and enables the person in the position to focus their efforts. There can be downsides to this approach, where other staff members perceive digital preservation not as a shared and collective endeavor, but as something they don't need to think about or participate in because someone else is taking care of it. Especially in the early stages of establishing a digital collections and preservation program, a team-based approach where multiple staff members are involved and contributing can serve to build a wider sense of ownership, creating a solid and resilient foundation for future implementation activities.

Observations & Recommendations

The primary staff positions focused on digital preservation activities, the Digital Archivist and Special Collections Librarian and Digital Initiatives / Technical Operations Coordinator, have made significant progress in developing workflows and maintaining infrastructure to support basic preservation of digital collections. Acquisition and preservation of digital collections is explicitly stated within job descriptions for these two roles. Currently, the Library has an overall

staffing shortage which has impacted its ability to conduct activities such as policy development, long-term strategic planning, and to continuously engage and collaborate with campus stakeholders. These staffing shortages have also impacted Archives and Special Collections department staff. The Digital Archivist and Special Collections Librarian has significant administrative responsibilities and as a result has had limited time to develop and implement digital preservation program elements such as policies and procedural documentation, as well as experiment with new software tools and research other technical infrastructure elements. The Digital Initiatives/Technical Operations Coordinator often has to pause regular digitization workflows to work on special projects such as implementing and migrating data to a new digital repository system. Student workers do a significant amount of digitization and collections processing tasks, but training and management of these workers requires substantial staff time and effort. It will be challenging to make continued progress in developing a digital preservation program unless investments in additional staffing resources are made.

1. ***Hire additional staff to focus on processing physical collections and digitization activities***

Many of the initial activities outlined in recommendations in this report to establish and build a digital preservation program will entail gathering and analyzing detailed information about current workflows and needs, developing initial policy and procedures documents, and developing criteria and requirements for infrastructure investments. With a backlog of physical archival collections in need of processing, along with many other responsibilities including providing reference and research consultation services, and administrative activities, it will continue to be challenging for the Digital Archivist and Special Collections Librarian to make progress on these fronts. The Digital Initiatives / Technical Operations Coordinator role has made significant progress in digitizing collections, but these workflows are regularly interrupted with other needs.

Efforts should be made to hire additional staff members to support physical collections processing and implement regular digitization workflows. These roles could potentially be part-time or project-based to provide more time for the Digital Archivist and Digital Initiatives / Technical Operations Coordinator to focus on developing core digital preservation policies and procedures, and implementing technical infrastructure improvements. If internal funding resources are not currently available, then external grant funding should be pursued to support temporary and/or project-based positions. If successful, implementing these additional staff positions will demonstrate the value that such positions will bring to continued digital preservation program development, especially if future activities involve expanded engagement with other College stakeholders.

B. Staff Training and Community of Practice

Digital preservation is an ever-evolving and relatively new area of expertise for institutions collecting cultural heritage material. As newer technologies develop, staff at these institutions must stay current with the latest developments in digital preservation. General conferences and continuing education courses can be helpful for benchmarking programmatic progress or learning about emerging trends. In order to gain practical skills and learn approaches that will work locally, attending more focused conferences, tools-based workshops, and user group meetings might be most useful. Professional development should not be seen as a privilege for individual staff members but rather as a rational approach to closing skills gaps in order to meet an institution’s strategic goals.

Not only is advocacy across an institution vital to digital preservation success, but finding and creating communities of practice has also been proven to be a successful tool for digital preservation planning.[3] A community of practice is a group of institutions that collaboratively works towards furthering its digital preservation knowledge and practices. Developing these peer networks can help staff collaboratively solve and strategize about common problems in different environments; collaboration may offer opportunities to review the success and challenges of implementing certain digital preservation or content management tools and to connect with staff in similar roles in different types of organizations.

Observations & Recommendations

Both the Digital Archivist and Digital Initiatives/Technical Operations Coordinator have solid background education and training in digital preservation and are regularly pursuing training opportunities in specialized areas. The Digital Archivist has annual professional development funding available to pursue training opportunities, but the Digital Initiatives/Technical Operations Coordinator position doesn't include regular annual funding for training.

1. Increase baseline digital preservation knowledge and skills for key staff members

It is essential that staff who are going to engage in the process of building a digital preservation program at the Library have a shared baseline knowledge of what is involved in planning and doing the work of digital preservation. Having a shared vocabulary and understanding of core concepts, standards, practices and benefits of digital preservation is a key element in enabling and empowering staff, especially those that will participate in a digital preservation governance group, to craft a unique and customized vision for digital preservation at the Library.

Even with their current background knowledge and experience, it is recommended that the core digital preservation team staff refresh their knowledge by identifying training opportunities that would provide an introduction and overview to digital preservation core concepts, strategies, and practices. This could include short courses, workshops, and webinars. Core staff members should select and attend one of these introductory training opportunities within a designated time frame (e.g. the first 6-12 months of the group formation). Additionally, other Library staff members should also be encouraged to engage in similar training to increase shared understanding across the organization.

Steps

- Research, identify, and assess current training opportunities providing an introduction to digital preservation (see Resources for starting point options)
- Research and investigate external funding sources (see below DPOE funding opportunity in Resources)
- Select initial digital preservation training opportunities for staff members

Resources

Digital Preservation Outreach and Education Network - Professional Development Funding
Digital Preservation Outreach and Education Network - Training Opportunities
Digital Preservation Coalition - Novice to Know-How: Digital Preservation for Beginners

2. Increase and enhance core digital preservation staff knowledge and skills in specific areas

[3] "From Theory to Action: Good Enough Digital Preservation for Under-Resourced Cultural Heritage Institutions," https://huskiecommons.lib.niu.edu/allfaculty-peerpub/1056/

Beyond investing in training opportunities to increase baseline knowledge of staff members, more advanced and topic-based training resources should be identified for core digital preservation team staff members. These training opportunities should be identified and selected based on initial program development priorities, but should potentially include topics such as:

- Digital forensics tools and methods
- Web archiving methods, tools, and ethical considerations
- Records management
- Digital preservation software tools

Steps

- Identify and prioritize a list of training opportunities for core staff members
- Map out training opportunities on a timeline over the next two years

Resources

Digital POWRR Institutes
Society of American Archivists - Web Archiving Fundamentals
Society of American Archivists - Digital Forensics Fundamentals

3. ***Join and participate in a digital collections and/or digital preservation focused community of practice***

Sometimes it can feel daunting and overwhelming to be taking on the challenge of digital preservation, especially if it is a new arena for staff members. Even when there is strong support and engagement within an organization, it can be very beneficial to connect with others outside who are engaged in their own digital preservation efforts. Fortunately, there are a range of communities made up of practitioners that are wrestling with similar challenges and working together to develop solutions. Identifying and joining one or more communities of practice focused on digital collections and/or preservation is highly recommended. It may seem that an organization should wait until their digital preservation program is more established before participating in an external community of practice, but often such communities have just the experience, expertise, resources, and models that can directly benefit an organization that is in the early stages of developing a local digital preservation program.

Resources

National Digital Stewardship Alliance
BitCurator Consortium
Digital Library Federation Born-Digital Access Working Group

C. Budgeting and Resources

Storage, access, and other ongoing digital preservation activities require budgetary support. Expenditures for software, hardware, and services are a consideration for both the near-term, beginning phase of establishing a digital preservation strategy, and for the long-term, ongoing maintenance of a digital preservation program. Because digital preservation costs, such as subscription services or cloud storage, are ongoing, it is difficult to support digital preservation activities with one-time grant funding, making an ongoing commitment through operating funds vital. A regular budget allocation for digital preservation costs helps sustain digital preservation efforts by providing a known funding source for maintenance, hardware upgrades, and a digital asset management system to access collections. Often, in an institution with digital collections, significant expenditure is already present but is hidden in IT or other budget lines that have

grown without specific planning for digital preservation. Identifying these costs can help provide a realistic budget for the current program and plan for growth.

Observations & Recommendations

Currently, there is not a dedicated Library budget line for digital preservation program activities. Funding for digital preservation activities is supported from other budget areas such as faculty and staff positions, library student workers, and technology and supplies. To date, grant-funding has not been extensively pursued to support digitization or digital preservation activities.

1. ***Draft an annual budget for digital preservation program based on current cost categories and estimates for future activities***

Current data on annual spending to support digital preservation activities should be analyzed and compiled as a budget foundation. If digital preservation costs are distributed across different sections of the current institutional budget, or in different department budgets, then this activity may entail gathering and compiling this information into a digital preservation related report and/or view of the overall budget. Additional cost categories and estimates should be added as they are identified. For example, as the core digital preservation team makes progress on specific activities, such as identifying and selecting staff training options, continued digitization of audiovisual materials, developing requirements for preservation storage in policy documents, and recommendations for preservation storage services, then estimates for ongoing costs should be updated and refined. Staff members with current responsibilities for drafting and managing budgets could play a significant role in this activity. Cost categories in an annual budget should include items such as:

- Staffing
- Staff training
- Hardware and software purchases, maintenance, and upgrades
- External storage services

Steps

- Document current cost categories for digital preservation
- Determine additional cost categories and estimates for ongoing resource investments

Resources

Digitization Cost Calculator
Curation Costs Exchange

2. ***Pursue grant funding to support digitization and collections processing activities***

As described above in Section II-A-1, grant-based funding could be used to support project-based and/or temporary staff positions focused on carrying out digitization workflows and processing of physical collections. Public and private grant-based funding opportunities should be researched and pursued where appropriate to supplement internal budget resources in support of digital preservation activities.

Resources

NEH - Humanities and Collections and Reference Resources
CLIR - Digitizing Hidden Special Collections and Archives: Amplifying Unheard Voices
CLIR - Recordings at Risk
National Historical Publications and Records Commission - Archival Projects
NEDCC - Fundraising and Grant Writing Tips

III. POLICY INFRASTRUCTURE

A. Strategic Planning

In addition to a strong mission statement, a strategic plan for digital collections ensures that projects follow a cohesive direction and that the program builds on success over time. Whether a plan for digital preservation is included in an institution-wide strategic plan or as a standalone plan just for the collections, it should describe the organization's vision and goals for digital collections. As with all strategic planning, the process should be transparent, include all the stakeholders within the institution, and be reviewed at a regular interval.

Observations & Recommendations

Currently, Rhode Island College is in a moment of transition, with new leadership in the early stages of setting new strategic directions. The Library is monitoring this process and seeking to engage and participate. At the moment, there is not an established strategic plan guiding the Library's current activities, but there is an opportunity to define where and how digital preservation can fit into the future direction of the Library and Rhode Island College as a whole.

1. ***Define and document a vision and set of shared goals for digital preservation***

Often figuring out the "what" and "how" of digital preservation seem to be the most pressing priorities, such as determining what software tools and services are needed to prepare digital objects for preservation storage, and how technical metadata will be captured and managed. But focusing on these more granular issues without spending time on the bigger question of "why" can be detrimental to continued progress. Defining why an organization is committing to the preservation of and future access to its digital collections is a fundamental activity.

This activity should be a priority because such a document will serve as a foundation that will inform future decisions and the development of additional policies and procedures documents. It will function as a guide that can be referenced by staff as they continue to develop and implement more granular parts of a digital preservation program, and also as a mechanism to communicate with external stakeholders.

The core digital preservation team should conduct discussions with an objective of developing and documenting a shared vision and set of goals for digital collections and preservation, to be able to have a clear answer to the question of why the Library is committing time, energy, and resources to ensuring future access to its digital collections. Such discussions should be one of the first activities that a digital preservation team engages in. A documented version of a vision and goals for digital preservation should be incorporated into an overall policy framework for digital preservation.

Steps

- Review resources and identify approach for conducting discussions on shared vision for a digital preservation program
- Conduct discussions to develop and document a shared vision and set of goals, that would come from continuing to develop a digital preservation program

Resources

Digital Preservation Business Case Toolkit - Benefits
Community Tool Box - Strategic Planning

B. Digital Preservation Policies

Digital preservation is best guided by a policy document, or set of documents, drafted and adopted at the administrative level. These policies provide consistency across an organization over time; communicate decisions and procedures for ongoing activities, and serve as an important record of decision-making for future stakeholders. The following policy areas are important but do not make up an exhaustive list. Organizational planning and staff professional development will reveal other areas that require policy development.

1. Collection Development

Physical collections are best acquired by relying on a written collection development policy, and digital collections are no different. A digital collection development policy specifies what subject, formats, or other areas of focus an institution primarily collects. An important corollary to the digital collection development policy is a deed of gift form that transfers ownership and intellectual property rights from donors to the institution. In addition to serving as a guiding document for staff, digital collection development policies also constitute a mandate for digital preservation when approved by an organization's administration. As with other policies that support digital collections, this policy may approach digitization priorities and born-digital acquisition separately or in a single document. Basing a collecting focus on the mission and community needs of the organization will ensure that the collections remain a priority for investment into the future.

Observations & Recommendations

It's clear that Special Collections department staff have worked extensively to create a foundational policy framework to guide the acquisition of a broad range of collection materials. These policy documents include:

- An Acquisitions and Donations Policy that outlines collecting areas and acquisitions criteria;
- A Faculty Papers Collecting policy describing what types of faculty materials will be considered for acquisition;
- And a Deed of Gift agreement and College Archives Transfer Form to document the transfer of materials.

Digital collections and/or born-digital materials are not explicitly addressed in these policy documents, but there is language within them that provides a broad framework for assessing and evaluating digital materials. Specifically, the acceptance criteria for materials in the Acquisitions and Donations Policy includes elements that state, "The materials must be in such a condition that the cost of preservation and conservation will not be excessive in relation to the materials' intrinsic or historical value" and "Special Collections must be able to house and care for the materials according to professional standards". This language offers a foundation where determinations about digital file formats, or potential technical infrastructure needs can be evaluated before deciding whether a set of digital materials should be acquired.

Current State of Rhode Island records laws mandate responsibility for collecting and preserving official College records, but Special Collections hasn't been designated as the official college archive. A draft records retention schedules from the State of Rhode Island exists that could provide a starting point for developing a local records management policy and retention schedules in the future.

1. ***Update the Collecting policy documents to address digital materials***

In their current form the Collecting policy documents provide a clear framework to guide decisions about what, how, and why physical items will be considered for acquisition into the Library's collections. This framework should be strengthened by including text addressing the acquisition, care, preservation, and access to digital materials within updated versions of the policy documents. There is a benefit to this approach of integrating language related to digital materials into the existing policy documents, in that it illustrates that digital collections are valued and cared for in an equal manner to physical collections, even if different strategies are employed to ensure their preservation and access. Details about the specific technical considerations and preservation and access strategies related to digital materials can and should be maintained with other policy documents, such as the Digital Preservation Plan. Including text addressing digital materials in the Collecting policy documents will clarify that such materials have been and will continue to be a part of the collecting scope of the Library.

Steps

- Review and discuss potential edits to current Collecting policy documents including:
    - Adding language about digital formats to the Collecting Areas section of the Acquisition and Donations Policy
    - Adding language about digital materials to the "Materials we will consider" section of the Faculty Papers Collecting Policy
- Integrate and approve proposed updates

Resources
Born Digital: Guidance for Donors, Dealers, and Archival Repositories
Brooklyn Historical Society - Collection Development Policy

2. ***Develop a records retention policy to guide the transfer of materials to the Special Collections from other College departments***

Rhode Island College faculty and staff have been and will continue to produce increasing amounts of born-digital materials. Not all of these materials necessarily need to be kept and preserved over the long term. Developing and putting into practice the policy framework and guidance to identify and select the subset of born-digital materials that are defined as institutional records is fundamental to ensuring accountability and transparency as well as a strategic investment of resources to enable continued access to valuable institutional knowledge.

As Special Collections has not been officially designated as the repository for College archives, this activity shouldn't be considered as high of a priority as other recommendations outlined in the report. Once progress has been made on other higher priority recommendations related to policy development, workflows, and infrastructure, then the Library will be in a much better place to engage collaboratively with other key stakeholders from strategic College units in the development of a records retention policy for college records.

Going forward, after an initial draft retention schedule is developed, additional next steps should include:

- Conducting interviews with staff members (virtually all administrative staff) to survey the records in their care
- Updating the records retention schedule to fit department needs and practices
- Developing guidance that empower staff to identify records, and follow records management guidance for the retention or disposal of records at the appropriate time

Steps

- Draft initial records retention policy and schedule
- Identify key staff members to interview
- Conduct interviews with key staff members to gather information about current practices and needs related to institutional records
- Update and expand records retention schedule to incorporate new record types

Resources
SAA Museum Archives Section - Records Management Resources
State of Alaska - Records Management Metadata
Vermont State Archives and Records Administration - Recordkeeping Metadata Guideline

2. Selection

Because digital preservation requires planning and investment over time, it is important to be selective about the digital objects that are brought into the collections that are designated for long-term preservation. The volume of born-digital and digitized materials only continues to grow, and making informed decisions about what to accession into digital collections is important for maintaining long-term access. While digital storage has become less expensive over time, there are long-term costs for storing and maintaining digital materials.

Born-digital collections require specific considerations for selection. It is important to consider the item's value to the collection, as well as the technical resources at hand for preservation. A selection policy that addresses born-digital materials can be amended over time, as the organization and staff gain capacity.

Selection policies should address *digital surrogates* as well. Individual scans created at a reference desk may not be worth maintaining in a preservation environment, but digital images created to serve as a faithful representation of the analog original as well as reformatted audiovisual materials are usually worthy of long-term preservation.

Observations & Recommendations
The current "Selection Policy for Digitization of Collections" provides a clear and concise guide to selecting physical collection materials for digitization. The requirements, criteria, and other considerations outline the various factors that should be taken into account when making selection decisions. In its current form, the policy document doesn't include technical specifications for digitization of different material formats. At this time, a similar policy document for evaluation and selection of born-digital materials has not been created.

1. ***Conduct annual review of selection for digitization policy***

While the core elements of the current selection for digitization policy are in alignment with best practices, the policy should be reviewed and evaluated on a regular basis. This review process will help to ensure continued alignment with local strategic objectives as well as broader digitization best practices and standards.

2. ***Define assessment criteria for born-digital acquisitions***

Born-digital materials can be more complicated and complex than those created through a defined and controlled digitization process. It's often not clear where, when, and how the digital objects were "born," i.e. created. The digital objects may be stored on legacy physical media that requires specialized equipment to read before staff can understand the content and other technical details. The selection of born-digital objects that can be acquired, accessioned, processed, and preserved within the Library's current technical infrastructure and resources

should be a starting point for defining priorities. As new or different types of media or file formats are considered for acquisition, these should be dealt with on a case-by-case basis.

The current Collecting policy documents include broad language that provide a solid foundation for evaluating born-digital materials for acquisition. The next step should be to create a set of local selection criteria that can guide the process of gathering technical and contextual information about born-digital materials and that can then be used to assess if a specific set of born-digital materials can be responsibly and feasibly acquired. Currently, the Special Collections department doesn't appear to be seeing a large number of potential acquisitions of born-digital materials, but developing an initial selection framework will help when these potential acquisitions inevitably increase.

Based on the Library's current capacity and infrastructure the following elements are recommended as a starting point for a set of assessment criteria for born-digital materials:

- **Alignment with collection development scope:** As a baseline, digital materials should be evaluated through the same lens as physical materials in relation to whether the digital materials fit within the collecting scope of the Special Collections department.
- **Technical feasibility for transfer:** Digital materials may be stored on various types of legacy media. The technical infrastructure that would be required to initially assess and potentially transfer digital files to contemporary storage media needs to be considered. It is recommended that the Library focus initially on acquisitions of new born-digital materials on media formats it can connect to, read, and conduct transfer tasks with its current infrastructure. Additionally, transfers of digital media over networks (e.g. emails, file sharing platforms like Google Drive and Dropbox) should be prioritized.
- **Storage expansion costs:** In some cases, a potential acquisition of born-digital materials would require significant expansion of existing storage infrastructure, especially for large volumes of digital files, or large data size files such as digital audio and video. Since storage infrastructure costs are ongoing, new acquisitions that would require expansion of storage beyond limits already planned and budgeted for may not be possible. For example, if acquiring a set of digital files will require immediately doubling or tripling of the current storage footprint, then such an acquisition should likely not take place without additional funding to support the needed storage expansion.

The assessment criteria for born-digital acquisitions should be documented and incorporated into either the Collecting policy documents or a new Digital Preservation Plan.

Steps

- Research and consult models provided in the Resources below for developing a set of assessment criteria
- Draft assessment criteria for born-digital acquisitions

Resources
Digital Preservation Decision Tree Model
Guidelines and Criteria to Select for Digital Preservation
NDSA - Digital Curation Decision Guide
UNESCO/PERSIST Guidelines for the selection of digital heritage for long-term preservation
Documenting the Now Ethics White Paper
DPC - Decision Tree
Legal and Ethical Considerations for Born-Digital Access

3. Preservation Plans

Just as understanding the vulnerabilities of physical formats leads to specific preservation planning for analog collections, a growing understanding of the vulnerabilities of digital collections should lead to specific preservation planning for digital materials that goes beyond a one-size-fits-all data backup approach. Preservation plans describe the specific strategies implemented to ensure long-term access to different formats in the institution's care. Redundant copying, storage architectures, and metadata are just some of the strategies used to preserve different types of digital objects according to their specific needs. Born-digital objects and video content may require different long-term approaches than other, simpler materials. Normalization and migration are practices that might be appropriate for certain digital objects.

Not every organization needs or has the ability to create preservation plans for all collections in their care at once. Expertise and policy adoption will develop over time, and the goal should be to get all items selected for permanent digital collections into a preservation environment managed at the institutional level.

Observations & Recommendations

The most significant and substantial gap in the current set of policy documents that needs to be addressed is the lack of a dedicated Digital Preservation Plan. Currently, the "Digital Initiatives Local Collections System – file management" document serves as a preservation plan for digital collections. This document provides a high-level outline of the systems and technical procedures that are conducted for basic storage, backup and access management for digital files within local on-site storage. No other high-level preservation plan document exists to guide decision-making for technical infrastructure and preservation actions.

1. Develop an initial Digital Preservation Plan

An initial Digital Preservation Plan should be developed to provide guidance and outline requirements for ensuring long-term preservation of and access to the increasing amount of digitized and born-digital materials that the Library is creating and will be acquiring going forward.

The specific recommendations for developing a Digital Preservation Plan outlined below are based in part on sections described in the Digital Preservation Policy Toolkit from the Digital Preservation Coalition (see Resources list below for details):

- Purpose and Goals: As described above, in Section III-A-1, a vision and set of shared goals for digital preservation should be developed as an initial activity of a digital preservation team. The results of this activity should be integrated into these sections.
- Organizational Commitment: This section should include language that illustrates alignment with current strategic objectives and/or a broader statement of organizational commitment that is more directly tied to the Library's mission and purpose.
- Governance: A section should be created that describes the role and responsibilities of a digital preservation team in the continued development, implementation, and maintenance of a digital preservation program. This section should include a description of the staff members that will participate in a digital preservation team.
- Scope: A Scope section should be created to define the range of digital materials that are to be included in long-term preservation and access. A relation should be made between this section and relevant sections of the other Collecting policy documents.
- Standards and Models: This section should include text describing requirements for preservation file formats, technical specifications for digitization of different physical materials, and any specific metadata standards and/or schemas that are used to create

or generate descriptive, technical, and preservation metadata. Additionally, any other digital preservation standards, models, or best practices (e.g. NDSA Levels of Preservation) should be described in this section.

- Principles: A Principles section should be created that describes the high-level principles that will be adhered to related to acquisition, ingest, metadata, storage, and access. This initial version should focus on the baseline preservation actions that will be carried out to ensure bit-level preservation of both digitized and born-digital objects.
    - Use the NDSA Levels of Preservation as a guide to establish these baseline preservation actions. The Assessment Tool version of the Levels of Preservation should be used to evaluate the current status of the Library in relation to the different levels and functional areas. Documenting the current status in relation to these levels provides a useful benchmark to then measure progress as the Library continues to advance its digital preservation practice over time. As described in the Levels of Preservation, the initial focus should be on including the following actions in an initial preservation strategy:
        - At least 3 copies of digital objects in stable storage
        - Generate or verify fixity information (checksums) for all digital objects
        - Document file formats and other content characteristics

Other sections to consider creating include Related Documents, Sustainability, and Document Control, but the above sections should be prioritized initially. An initial version of the Digital Preservation Plan will serve as an essential foundational policy to inform the development of workflows, selection of software tools, and updates to digital storage infrastructure.

Steps

- Use the Digital Preservation Policy Toolkit and other resources listed below as a lens to develop an initial Digital Preservation Plan

Resources
DPC - Digital Preservation Policy Toolkit
NDSA Levels of Preservation
Digital Preservation Step by Step
DPC - Getting Started - First Steps to Securing Your Data
Northern Illinois University Digital Preservation Policy

2. *Define and document technical specifications for digitization of different content types*

Ensuring that the digitization of physical materials is conducted in a consistent manner is a key element for long-term preservation and access. The Library has developed its own set of technical specifications informed by standards and best practices. The next step should be to formally document these specifications in policy documents. The resulting Digitization Technical Specifications should be included in the Standards and Models section of a Digital Preservation Plan, as described above. Once defined and documented, these technical specifications can also be shared with any future digitization vendors.

Steps

- Gather any existing documentation on technical specifications for digitization of physical materials
- Consult examples of technical specifications documentation in Resources below
- Draft Digitization Technical Specifications

Resources
Northern Illinois University - Digitization Guidelines
Smithsonian Institution Archives - Digitizing Collections
FADGI Technical Guidelines for Digitizing Cultural Heritage Materials
Library of Congress - Recommended Formats Statement
NISO Data Dictionary – Technical Metadata for Digital Still Images
The NINCH Guide to Good Practice in the Digital Representation and Management of Cultural Heritage Materials
Capture Your Collections: A Guide for Managers Who Are Planning and Implementing Digitization Projects

3. Define and document metadata standards and requirements for digitized materials

Consistently creating and capturing standards-based metadata is an essential element in an overall preservation strategy for digital objects. Since it is likely that a significant volume of new digital objects will be created through digitization activities, the initial focus should be on defining the metadata requirements and standards that will be used during these activities. To date, the Dublin Core Metadata Standard has been used to create local descriptive metadata for digitized materials. It would also be worth investigating other descriptive metadata standards before making an initial decision about which standard to implement, but continuing to use Dublin Core should be strongly considered. As audiovisual materials are also currently being digitized then additional descriptive and technical metadata standards for these materials should be also be considered. These metadata standards should be formally documented with the Standards and Models section of a Digital Preservation Plan.

Steps

- Utilize the Dublin Core Metadata Standard as the foundation for local descriptive metadata requirements
- Identify additional metadata standards that should be used for specific content types
- Draft metadata standards and requirements for digitized materials

Resources
Dublin Core Metadata Standard
Digital Toolbox Metadata
Digital Commonwealth Metadata Requirements
Digital Collection Project Best Practices
PBCore - What is PBCore?

IV. PROCESSES AND WORKFLOWS

As discussed in the Introduction, digital preservation requires active management of assets to ensure their longevity and authenticity. Various models have been developed to articulate the complete lifecycle of digital materials. One such model is the Digital Curation Centre's (DCC) Curation Lifecycle Model, which illustrates data management workflows and actions necessary to sustain long-term preservation and access to digital assets. While originally developed for use in the research data management sector, the Model reflects the same phases and workflow used in the digital preservation field. The model can also be used to clarify roles and responsibilities associated with each phase. Essential functions within the Model (such as storage, preservation planning, and management activities) are highlighted within this report, and referring to the Model may help staff to conceptualize the processes and workflows described below.

A. Content Creation

Digital collections may be created through digital reformatting, or through regular business or artistic creation. Digitizing or collecting digital materials for access, however, may not involve the thoughtful selection and long-term preservation practices necessary for digital preservation. As in preservation of physical collections, knowing how a digital file was created and understanding its risks helps inform preservation decisions throughout its lifetime. Oftentimes a collecting institution can determine or advise in the creation of digital objects in order to make it easier to preserve them in the future. These determinations should be guided by standards informed by best practices to ensure that policies are implemented consistently and serve the institution's goals for preservation.

1. Reformatting

Observations & Recommendations

Special Collections staff have made significant progress building local technical infrastructure and establishing workflows to digitize a wide range of materials, including audiovisual materials, as part of an in-house digitization program. This has allowed staff to incrementally adjust and expand as needed to support digitization of different physical formats. The technical specifications used to digitize materials appear to be alignment with recommended best practices, but these are not clearly documented in policy or procedure documents. Informal guides have been created to train student workers on digitization equipment and workflows.

1. ***Document local digitization procedures and ensure alignment with digitization and digital preservation best practices***

To build on the progress that has been made in digitizing collection materials, the next step should be develop a robust set of procedures and workflow documentation materials. Documenting current workflows will provide a baseline that can then be used to evaluate current practices against recommended standards and best practices. The following areas should be included in documentation for digitization workflows and procedures:

- Digital capture / conversion of physical materials
    - Utilize best practices in capturing and creating digital versions of physical materials, either when working with external vendors or via in-house workflows. Review resources such as the FADGI Technical Guidelines for Digitizing Cultural Heritage Materials to determine if any changes should be made to the capture process for different material types.

- File Naming protocols
    - Ensure a designated file naming convention is used for digital files created either by vendors or in-house. Review resources such as the FADGI Technical Guidelines for Digitizing Cultural Heritage Materials to determine if any changes should be made to local file naming conventions.
- File formats for preservation and access copies
    - Create digital files in standard file formats for preservation and access versions
    - For still images, TIFF or JPEG2000 are preferred formats within the Library of Congress - Recommended Formats Statement so either could be used, depending on local needs.
- Metadata capture and creation (technical, administrative, descriptive)
    - At minimum, create basic descriptive metadata for all digital files
    - Consider creating and/or generating embedded metadata for preservation files. Review the NISO Data Dictionary – Technical Metadata for Digital Still Images and FADGI - Guidelines for Embedding Metadata in Broadcast WAVE Files resources to determine the basic technical metadata about the digitization process that should be captured and managed.
- Generation of fixity information
    - Checksums should be generated for **all preservation versions of digital objects** before they are transferred into different storage locations, including local and offsite locations.
- Quality control
    - Review the Resources below to determine if changes should be made with current quality control procedures to improve local practices.

Particular attention should be paid to including quality control steps and actions within digitization workflows. Especially when working with external vendors, quality control is very important. Including steps to confirm that digital objects are conforming to the required technical specifications, and that errors or issues are discovered and resolved, will help to ensure that high quality preservation-ready digital objects are being produced.

A documented and updated digitization workflow based on digitization and digital preservation best practices can then be used to identify and select additional tools and systems that will be needed to implement new workflow steps and actions. Also, this workflow can be used to identify additional training that staff will need to implement new tools, systems, or processes.

Steps
- Document current local digitization procedures and workflows
- Review standards and models in Resources list and update local workflows to align with recommended best practices

Resources
Wisconsin Historical Society - Digitization Workflow
Wisconsin Historical Society - Quality Control for Digitization Projects
Scan and Deliver: Managing User-initiated Digitization in Special Collections and Archives
FADGI - Guidelines for Embedding Metadata in Broadcast WAVE Files
Library of Congress - audioMD, videoMD, and AES Schemas and Documentation
Capture Your Collections: A Guide for Managers Who Are Planning and Implementing Digitization Projects
NYPL AMI Project Administration and Handling
Guidelines on the Production and Preservation of Digital Audio Objects

2. Born-digital Objects

Observations & Recommendations

In recent years born-digital objects have started to be acquired by Special Collections, but to date these have not been in large amounts. Born-digital materials are often acquired on various formats of electronic media as part of hybrid collections with other physical materials formats. Hardware and software infrastructure has been established and a set of procedures has been developed to transfer born-digital objects from a range of electronic media including floppy disks, CDs, DVDs, and Zip disks. These procedures include utilizing digital forensics practices such as creating and saving disk images of electronic media items before extracting and transferring individual born-digital files. The recent acquisition of born-digital materials from Congressman James Langevin has also provided an opportunity to consider the types of discussions that should happen with donors / creators to understand and assess these materials during acquisition and transfer. Other born-digital objects are acquired through the Digital Commons institutionally repository platform, where faculty and students directly submit their content. A relatively small amount of web archives have been acquired by Special Collections via the Internet Archive's Archive-It service. Additionally, born-digital records are regularly being created by staff in College departments, but to date these have not been regularly transferred to Special Collections.

The details of the infrastructure and procedures for transferring and initially processing born-digital materials has not yet been formally documented. A Processing Manual for Archival and Manuscripts Collections exists that provides a very useful and detailed set of procedures and guidelines for accessioning, processing, and describing archival collections. The current version of this manual is primarily focused on the processing of physical materials, and doesn't include specific procedures or guidance for acquiring and processing born-digital materials.

1. ***Establish and document a workflow and procedures to stabilize born-digital materials acquired from external donors***

Even if the Library is not faced with the challenge of regular donations of large amounts of born-digital materials, there is a need to establish a basic workflow to ensure that the born-digital materials acquired from external donors are stabilized and basic information gathered to inform future preservation decisions and actions. The development of this workflow should proceed in relation to the types of born-digital objects currently in archival collections, and be based on best practices where feasible and possible. Such a workflow should involve steps such as:

- Collecting information about born-digital materials from donors and/or creators
- Documenting details about removable media
- Transferring digital objects from removable media to local storage
- Conducting an initial assessment of the digital objects (e.g. data size, content types, dates)
- Documenting technical information such as file formats and software dependencies
- Generating initial checksums (for both disk images and individual extracted digital files)
- Moving born-digital objects to secure storage

Fortunately, there are a range of resources available (see Resources list below) that could be used as models to inform the development of an initial local workflow for born-digital materials. Such a workflow should be seen as a starting point that will likely need to be updated, revised, or expanded if and when new types of born-digital content or removable media are acquired. A basic draft workflow will also be helpful in determining the technical infrastructure (including

hardware and software) needed to support the acquisition and stabilization of born-digital materials. After this draft workflow is tested and refined, the procedures should be integrated into an updated version of the Processing Manual for Archival and Manuscripts Collections.

Steps

- Review Resources below to increase understanding of common workflow steps and activities
- Draft initial workflow and procedures for the acquisition and processing of born-digital materials
- Test and refine initial procedures
- Update Processing Manual for Archival and Manuscripts Collections with procedures to acquire and process born-digital materials

Resources
Digital Processing Framework
Born Digital: Guidance for Donors, Dealers, and Archival Repositories
NYPL - Acquiring Born-Digital Material
Agreement Elements for Outsourcing Transfer of Born Digital Content
Scalable Born Digital Ingest Workflows for Limited Resources: A Case Study for First Steps in Digital Preservation
OSSArcFlow Guide to Documenting Born-Digital Archival Workflows
Accessioning Workflow for Born-Digital Archives
Austin Public Library - Born-Digital Processing Manual

B. Metadata

Metadata is information that assists in the discovery and preservation of digital objects. While many cultural heritage institutions have focused on providing good descriptive metadata to ensure access to digital materials, it is also important to include technical, administrative, and preservation metadata. Following standards set by the library, archives, and museum fields regarding these types of metadata demonstrates authenticity and transparency and follows best practices.

Metadata is also maintained as a digital object. It may be stored in the form of an XML document, within a collection management system, as a spreadsheet, or in other formats. Preserving this information and its connection to the digital files will help people in the future understand the digital collections. Institutions frequently invest significant time and effort in creating descriptive metadata for digital collections, and that investment should be valued and protected by maintaining the metadata itself along with the digital collections.

Observations & Recommendations

Metadata is regularly being created by Library staff and student workers as part of digitization workflows. This primarily descriptive metadata is loosely based on the Dublin Core Metadata Standard and is initially entered into a local metadata management software tool that includes a web-based front-end on top of a MySQL database. Local backups of metadata are maintained and versions of metadata are exported and uploaded into public access systems, such as the Digital Commons platform. Descriptive metadata for archival collections is created and managed within the ArchivesSpace collection management system. No formal procedures to guide metadata creation and management have been created and documented.

1. ***Establish guidelines to create, manage, and preserve standards-based metadata for all digital objects***

Metadata creation and management should be addressed at multiple levels of a digital preservation program, from high-level policies down to step-by-step workflows. Recommendations for specific metadata-related actions are included in multiple sections of this report. These are summarized below to illustrate how these elements connect together to ensure consistent and quality metadata is created and maintained for all digital objects needing long-term preservation and access. The focus should be on developing procedures to clarify the what, when, and where of metadata.

- What metadata is created or captured
  - Metadata standards and requirements in policies (See sections III-B-1-2)
- When metadata is created or captured
  - Digitization workflows (See section IV-A-1-1)
  - Born-digital workflow steps (See sections IV-A-2-1)
- Where metadata is created, managed, and stored
  - Systems and Tools (See section V-C-1)
  - Storage locations (See section V-D-2)

A high priority need is related to the "where" element, ensuring that local copies of metadata are being managed and preserved alongside the associated digital objects. Creating descriptive metadata is often one of the most resource-intensive tasks in an overall digital preservation workflow, so reducing the risk that such metadata is lost is very important.

Resources
Digital Collections Workflow and Metadata Guidelines

2. ***Develop procedures to guide the creation of descriptive metadata for born-digital materials in archival collections***

Determining how to go about describing born-digital materials can be a challenging task, especially in relation to the volume, scale, and complexity of these materials. There is not the same level of consensus on best practices for description of born-digital materials as there is for physical materials in archives. That said, the Library should move forward in advancing its local practices by developing an initial set of procedures to guide the process of creating descriptive metadata for born-digital materials that are acquired as part of archival collections. The UC Guidelines for Born-Digital Archival Description is an excellent resource to utilize as a starting point for creating local procedures. These guidelines should be integrated into the existing Processing Manual for Archival and Manuscripts Collections to enhance and expand the current descriptive practices.

Steps

- Review guidance from the UC Guidelines for Born-Digital Archival Description
- Update Processing Manual for Archival and Manuscripts Collections with instructions and guidance on describing born-digital materials

Resources
UC Guidelines Born-Digital Archival Description

C. Documentation

Several areas in this report reference developing written drafts of policies and procedures. Documentation -- the internal recording of decisions, commitments, procedures, and practices in a work setting -- is one of the most critical activities stewards of digital collections engage in. Regardless of what particular decisions are made in the course of preservation, documenting procedures and decision-making processes will help future employees take the correct preservation actions when they are required.

Observations & Recommendations

Special Collections staff has created quality documentation primarily in the form of policy documents that provide helpful guidance for staff implementing archival processing and digitization and workflows. Going forward, there is a strong need and opportunity to create additional policy and procedural documentation to fill in gaps related to specific activities and workflows including:

- Digital Preservation Plan
- Digitization workflows
- Born-digital acquisition workflows
- Metadata creation and management workflows

1. Create documentation for high priority workflows and procedures

The initial focus should be on creating comprehensive documentation for high priority workflows and procedures. The goal should be to produce documentation that captures the details of the multiple steps involved from start to finish. The resulting documentation can be seen as a benchmark and reference point to assess what additional steps and actions should be integrated into workflows to better prepare digital objects for preservation and future access

Steps

- Review current workflows and activities
- Review recommendations throughout this report to identify high priority workflows to develop first
- Use resources to guide the process of creating workflow and procedures documentation
- Identify a centralized location to make documentation available to other staff members

Resources

Digital Preservation Documentation: a guide

OSSArcFlow Guide to Documenting Born-Digital Archival Workflows

V. TECHNOLOGICAL RESOURCES

A. IT Support

Support for digital preservation requires collaboration from collections staff to identify materials to preserve and from IT to provide some of the storage support required to monitor materials over time. This relationship is similar to physical storage environments. Physical collections need specialized knowledge from collections staff to implement best practices for storage, care, and handling, but also require facilities staff's expertise to monitor and service the HVAC or other controls for the physical environment. Digital materials still need the specialized knowledge to select, store, and monitor materials from collections staff, and IT staff's expertise to contribute to the design and implementation of the approaches.

While both large and small organizations can achieve digital preservation goals, technological resources play an important role in determining the level of care and scale of collections an organization can preserve and provide access to. Institutions should cultivate support among IT staff and contractors to develop digital infrastructure that supports preservation. This may include implementing tailored storage solutions to meet digital preservation needs, as well as applying IT security strategies to protect digital materials from accidental alteration and malicious attacks. IT staff may also help facilitate the institution's data management strategy by supporting tools that provide control over and access to collections and their associated metadata.

Observations & Recommendations

Currently, IT support for digital preservation is provided primarily by the Digital Initiatives / Technical Operations Coordinator role, including: managing and maintaining the local file server when all digital files are currently stored; maintaining regular backup schedule to secondary onsite storage; maintaining the local web server; installing and managing local software applications; and maintaining and upgrading digitization equipment. Very limited support is provided by Rhode Island College Information Technology Services, focused primarily on software installation and upgrades. Some documentation of current hardware and software infrastructure, as well as a high-level overview of network access protocols and backup procedures has been created. No formal procedures describing regular IT support tasks such as system monitoring, hardware refresh cycles, and security protocols have been documented and regularly updated.

1. ***Develop and document formal procedures to describe ongoing IT support activities***

The concentration of IT support for digital preservation within the role of the Digital Initiatives / Technical Operations Coordinator position has allowed flexibility in selecting and implementing technical infrastructure elements as digitization and digital preservation activities have been established within the Library. This scenario has also supported the growth of local infrastructure for digital collections, which otherwise would have been challenging in relation to limited IT support from centralized College IT services. But with only one role and individual providing primary IT support responsibilities, there is potential range of risks that may occur in the current scenario. At a minimum, steps should be taken to create procedures and robust documentation of current IT support processes and practices. This documentation should be detailed enough so that if needed other staff members, or temporary IT service providers, could understand the current system, conduct regular tasks, and/or troubleshoot issues. Such documentation should be considered as a baseline to ensure continuity of operations in the

case of the Digital Initiatives / Technical Operations Coordinator not being available to conduct regular IT support activities.

Resources
Digital Preservation Documentation: a guide

B. Legacy Media

Legacy carriers are media that are no longer widely used, but were once popular for sharing or storing digital content. This includes CDs, flash drives, zip drives, floppy disks, and more. Legacy media present specific risks to the digital collections they carry. As these media become obsolete, institutions will find it increasingly difficult to extract their contents and move them to more stable storage solutions. Additionally, materials on legacy media are difficult to monitor, backup, and manage given that they need to be manually connected to a computer to be accessed. This makes the collections on legacy media at an increased risk of loss. Given these shortcomings, institutions should work quickly to identify and transfer materials on legacy media for incorporation into a higher quality storage environment.

Observations & Recommendations

A wide range of legacy media formats have been identified as part of larger archival collections including floppy disks, CDs, DVDs, USB drives, hard drives, data tapes, and zip disks. When identified, these media items are separated and born-digital objects are transferred to contemporary digital storage. It is likely that there are additional legacy media items contained within unprocessed collections, but the volume and range of these items is not currently known. No formal inventory of legacy media items has been established and maintained.

1. ***Conduct an inventory of existing digital materials including those on legacy electronic media***

Steps should be taken to collect information about previously acquired legacy electronic media currently stored in physical collections. If legacy electronic media is stored in multiple locations, including mixed in with other physical collection formats, then it may necessitate more time and effort to identify, document, and separate removable media. Additionally, digital materials, including digitized materials, in other storage locations such as the local storage server and external hard drives should be documented in a basic inventory. Such an inventory should include elements such as number of files, total data size, types of file formats, dates of files, etc. This inventory will provide baseline information that can be used to inform decisions about infrastructure investments such as expanded storage, or software to transfer, analyze, and potentially migrate / normalize legacy file formats.

Steps
- Identify information needed to document in a born-digital inventory
- Draft born-digital inventory template
- Conduct born-digital inventory

Resources
DPC - Digital Asset Registers
Digital Preservation Webinar Series - Identify
Digital preservation inventory template for cultural heritage institutions

2. ***Maintain a dedicated computer workstation to conduct digital preservation tasks***

To support the types of digital preservation tasks and actions recommended to be included in policy documents and workflows, a dedicated computer workstation will be needed. The Library has acquired hardware and other equipment to establish basic infrastructure to support digital preservation tasks. This machine can continue to be used to assist in born-digital workflow tasks as well as quality control steps for digitization workflows. Requirements for a dedicated workstation should be based on the baseline bit-level preservation strategy elements outlined in an updated version of the Digital Preservation Plan (See section III-B-3-1). This policy guidance should be developed before proceeding with drafting workstation requirements. As a next step the Library should evaluate the current hardware and software setup for the existing workstation to determine what additional improvements should be made. A good starting point could be installing and experimenting with digital forensics software tools to conduct assessment and analysis tasks of born-digital files received on legacy media. As with other technical infrastructure, a dedicated machine can be upgraded and expanded as needed in relation to changing content types and needs.

The planning process should involve the Digital Initiatives / Technical Operations Coordinator, as a priority requirement will be the ability to install, configure, and use specialized software tools to conduct digital preservation actions such as identifying and documenting file formats. Such tools, especially if they are open source, may entail a different level of IT support and experimentation to get up and running.

Steps

- Review information about current media types and formats from born-digital inventory (see Section V-B-1)
- Review examples of workstation elements and setups in Resources list
- Draft initial requirements for a computer workstation to acquire, transfer, process, and prepare digital objects for long-term storage
- Evaluate and determine changes or upgrades to make with existing computer workstation setup

Resources

You've Got to Walk Before You Can Run: First Steps for Managing Born-Digital Content Received on Physical Media
Walk This Way: Detailed Steps for Transferring Born-Digital Content from Media You Can Read In-house
Digital Media Transfer Workflow
What's Your Setup Blog Series

C. Data Management Tools

When preserving digital collections, software tools are necessary to manage the digital objects being stored. The ultimate goal should be a set of tools and configurations that automates preservation activities as much as possible and does not cause undue burden on staff time. Depending on the tools used, these software tools help keep metadata associated with their objects, add or remove metadata, keep track of master files, automatically generate access files, run reports on objects or collections, make and store redundant copies of master files, and other preservation tasks. There are many approaches to configuring a computing setup that achieves organizational goals, and one size does not fit all.

Observations & Recommendations

A number of different software tools are currently utilized to create and conduct quality control of digital files as part of digitization workflows. Metadata is created and managed within a locally managed software tool built on a MySQL database. A hosted instance of the BePress Digital Commons software is currently implemented as an institutional repository, but a project has been initiated to move to the TIND digital repository platform. Additionally, ArchivesSpace is used as a collection management system for archival collections. All together these different software tools function as a solid foundation for managing administrative and descriptive metadata about digital collections.

1. ***Research, explore, select, and implement software tools to support baseline digital preservation tasks***

Often, there can be a strong desire within organizations to find the one software tool or system that will do all of the things that need to be done to acquire, process, describe, preserve, and provide access to digital objects. This is understandable, but especially when an organization like the Library is in the early stages of establishing a digital preservation program it is recommended to start with identifying and selecting simple tools to implement basic preservation actions. Using such tools will help staff to gain experience and understanding on how these tools work, what the results look like, and how to interpret results. This process helps to demystify the work of digital preservation and maintain a good level of transparency. Once a baseline preservation workflow is implemented and operational, then more advanced tools and processes that automate and integrate multiple preservation tasks can be researched and considered. It is also often more cost effective to focus on supporting high priority needs rather than implementing higher cost tools and systems that have more features than are initially needed.

Steps

- Identify and develop tool specifications based on requirements for preservation actions described in a Digital Preservation Plan
    - Start by exploring tools such as digital forensics software (e.g. BitCurator software environment), and file format identification toolsl
- Assess and document current software tools against requirements for preservation actions (See example list of preservation actions and software tools in Appendix B)
- Research and identify initial tools to explore and test
- Assess and select initial tools to support requirements for preservation actions
- Install, configure, and test selected software tools

Resources
Digital Preservation Handbook - Tools
Community Owned digital Preservation Tool Registry (COPTR)
DANNNG Tool Selection Factors
Digital POWRR Webinar Series - Module 2

D. Digital Storage

Digital storage for preservation involves more than just identifying space on a server and performing regular backups. Storing digital materials marked for preservation involves redundant, managed storage, where copies are isolated from each other and regularly monitored for fixity and file integrity. Simple backups are insufficient for preservation, because they involve disk images that copy mistakes and data corruption without detecting these issues.

When files are managed in a preservation storage environment, these files are regularly monitored for such mistakes and ideally stored in many locations to minimize risk.

Digital collections do not need to be collocated onto a single type of storage device, or a in a single storage arrangement. But the devices used should be able to be connected to software tools that can help manage their integrity over time, including authentication of staff who should have access to original objects.

Observations & Recommendations

All digital collections files, including those from digitization activities, as well as born-digital materials that have been acquired, are currently stored on local storage infrastructure within the Digital Initiatives room in the Adams Library building. This storage infrastructure includes a primary server, a secondary server where daily backups are stored, and offline external hard drives where monthly backups are stored. While a solid level of redundancy has been established with the current infrastructure, these local copies are still at risk of loss if a local disaster occurs within the room or larger building. Additionally, faculty and student scholarship stored in Digital Commons are maintained within the BePress storage infrastructure system, and web archives created via the Internet Archive ArchiveIT service are stored and maintained within the Internet Archive storage infrastructure. No local copies of institutional repository content or web archives are maintained.

1. Define and document preservation storage criteria

A high priority action should be to take steps to implement a preservation storage solution that includes offsite storage. This will assist in mitigating the risk of data loss should a disaster event occur with the local storage infrastructure. The process for selecting and implementing an initial preservation storage solution should start with the development of a set of criteria for preservation storage. Taking the time to define and document local criteria for preservation storage will help to clarify and prioritize needs and can then be used as the basis to evaluate currently available options. A set of local preservation storage criteria will function as a more granular description of preservation storage commitments outlined in a Digital Preservation Plan document. Two resources provided in the Resource list should be used to inform the development of local preservation storage criteria. The NDSA Levels of Preservation outlines some high-level criteria for Storage and Integrity and provides a good starting point. The Digital Preservation Storage Criteria resource includes a more granular set of criteria that should also be reviewed and considered. Including some of these more detailed elements would help to create a more customized set of preservation storage criteria that fits the current context and needs of the Library. As the Library continues to develop and implement its digital preservation program, the preservation storage criteria should be updated to reflect any change in local needs. A draft template and suggested set of initial preservation storage criteria is included in Appendix C.

Steps

- Review the NDSA Levels of Preservation and Digital Preservation Storage Criteria resources
- Use the preservation storage criteria template to draft an initial set of local preservation storage criteria

Resources
NDSA Levels of Preservation
Digital Preservation Storage Criteria

2. *Evaluate, select, and implement a preservation storage solution*

The Library needs to select and implement a dedicated preservation storage solution. The focus of this digital preservation infrastructure element should be:

- To ensure that copies of digital objects designated for long-term preservation are stored in a secure, geographically distributed location.
- To limit access to these preservation copies to designated staff.
- To only access digital objects in case of disaster or loss of local copies.
- To regularly monitor and verify fixity information of stored digital objects.

The local preservation storage criteria (See recommendation V-D-1) should be used to evaluate and assess preservation storage service providers. Information collected about the data size of digital materials during the digital materials inventory activity (See recommendation V-B-2) should be used to estimate the initial costs of storage with different service providers. The "Getting to the Bottom Line" resource provided in the Resources list below provides a useful set of questions to consider when gathering information about costs from service providers. Once a service provider is selected it is recommended that initial transfers focus on digital materials that have already been designated for long-term preservation.

Steps

- Use local preservation storage criteria to evaluate preservation storage service providers
- Request estimates from service providers to include cost information in evaluation
- Select preservation storage solution
- Implement and test with an initial transfer of digital objects

Resources

MetaArchive Cooperative: Getting to the Bottom Line - 20 Cost Questions for Digital Preservation
Storage is a Strategic Issue: Digital Preservation in the Cloud
DSHR Blog - Cloud For Preservation
RAC: Keeping Our Heads in the Cloud: Building a Cloud-based Infrastructure for Digitized Audiovisual Files
AVP: Feet On The Ground: A Practical Approach To The Cloud Nine Things To Consider When Assessing Cloud Storage

E. Security and Authenticity of Collections

Authenticity is the "quality of being genuine, not a counterfeit, and free of tampering."[4] Ensuring the authenticity of materials has been identified as part of the Core Values of Archivists, as adopted by the Society of American Archivists.[5] Unlike analog materials, it is not obvious when a change to a digital object has occurred, so it is important to adopt a risk management strategy that takes this fact into account. Tightly controlling access to master files, logging that access, and recording any intentional changes to objects (such as any movements or preservation actions taken) are good ways to manage the risk of inadvertent changes or deletions.

Generating and reviewing checksums, a process also known as fixity checking, is a standard way to verify whether an item has changed during transfer or storage. A checksum is a unique

[4] *SAA Dictionary of Archives Terminology, https://dictionary.archivists.org/entry/authenticity.html.*

[5] *SAA Core Values Statement and Code of Ethics*, Society of American Archivists, *https://www2.archivists.org/statements/saa-core-values-statement-and-code-of-ethics*

string of characters that is associated with the file in its exact iteration at the time of the checksum's creation. If the file changes at all, and a checksum is generated again, then the original checksum and the new checksum will not match. If a file stays the same, the checksum generated will remain the same. Running checksums and storing them with files is an important part of risk management, but it is not a replacement for well-thought-out access and permissions policies. Developing these policies is often a higher priority than instituting technical fixity workflows.

Observations & Recommendations

A basic level of security has been established to protect digital collections. Basic access controls have been established to limit access to preservation versions of digital files to selected staff, but logs documenting access have not created or maintained. Local storage infrastructure is maintained in a room with locked doors, but this room also serves as a workspace for staff. The creation of checksums has been implemented, but not consistently for all digital files. Checksums are created for preservation versions of digital files as part of digitization workflows before they are moved into local storage. Checksums are also created for disk images of born-digital materials received on legacy media, but not currently for preservation versions of digital files extracted from disk images. Additionally, checksums are not regularly verified while at rest in local storage, only upon access and/or use. These actions provide a solid foundation to ensure the security and authenticity of digital collections, but improvements can and should be made to fill in the above identified gaps.

1. Conduct systematic fixity checks of digital objects in storage

One of the main elements that distinguishes preservation storage from regular IT backups is the implementation of fixity checks (checksums) to monitor and verify the integrity of stored digital objects at the bitstream level. Combined with selecting and implementing a preservation storage solution, ensuring a scenario where all preservation versions of digital objects are located within storage environments where fixity checks are regularly performed and errors are reported should be considered a high priority. These checks can and should be automated to be carried out on a regular schedule in both local and offsite storage locations. The focus initially should be on implementing regular fixity checks in local storage environments, as these can be customized to meet specific requirements. Going forward, as preservation storage service providers are evaluated, the ability to schedule and view reports of the results of regular fixity checks should be prioritized in the overall set of preservation storage criteria. The cost details related to the frequency of fixity checks can be variable so it will be important to ask direct questions about fixity checks features when interacting with potential service providers.

Steps

- Review storage locations of current digital objects (reference digital objects inventory if already completed)
- Determine options for implementing fixity checks in local storage environment
- Select and implement initial method and/or tool to conduct regular fixity checks in local storage environment
- Review and assess options for implementing fixity checks in offsite / external storage service providers

Resources

NDSA - Checking Your Digital Content
Which checksum algorithm should I use?
COPTR - Fixity

2. ***Start maintaining access logs for digital materials in preservation storage***

The Library has implemented a good practice of implementing access controls for preservation copies of digital files. As a next step, access logs documenting details of when staff users access preservation copies of digital files should be maintained. This would be in alignment with Level 3 of the "Control" functional area in the NDSA Levels of Preservation (see Section III-B-3-1). Creating and maintaining these logs for designated periods will provide the opportunity to demonstrate transparency and illustrate that information security policies are being consistently practiced.

3. ***Document and identify gaps in current information security policies and practices***

A good next step for the Library is to document current information security policies and practices, and then identify gaps where additional measures can be taken to ensure preservation copies of digital objects are protected. The "Control" functional area of the NDSA Levels (see Section III-B-3-1) provides a useful lens to initially assess how information is being secured, and should be utilized along with additional resources listed below.

Steps

- Document current information security policies and practices
- Identify gaps in current information security practices
- Discuss and determine options for making progress to fill gaps with IT support services staff

Resources
DPC Handbook - Information Security
Digital Preservation Storage Criteria

CONCLUSION

Staff in the Special Collections department at the James P. Adams Library at Rhode Island College clearly demonstrate a passion and a drive to steward digital collections moving forward. Staff have worked hard to formalize practices where possible and to develop local storage solutions for growing digital collections. Staff in the Library also recognize their challenges going forward. In a medium-sized organization where digital preservation is a relatively new endeavor, core staff have struggled to prioritize making continued progress with digital preservation in relation to a range of other responsibilities and duties. Staff understand that, moving forward, it will be necessary to allocate more time to key staff positions to focus on coordinating the continued development and implementation of a digital preservation program.

The decision to pursue a digital preservation assessment attests to an interest in improving the long-term outlook for digital collections, and if this report spurs the development of a robust preservation program to support the needs of the Rhode Island College community, the Library's digital collections will be much more sustainable into the future.

As the Library continues to grow its digital collections and further develop its strategies to preserve them, it faces several challenges, including:

- Lack of staff capacity to coordinate and implement policies, processes, and infrastructure to support the creation, acquisition, management, and preservation of digital collections

- Lack of policy guidance and procedures related to the creation, acquisition, management, and preservation of digitized and born-digital materials
- Lack of key digital preservation technical infrastructure elements, including an implemented preservation storage solution

With these challenges in mind, efforts over the next several years should focus on:

- Investing in additional staffing support to allow the core staff team to coordinate the continued development of a digital preservation program
- Developing core digital preservation policies, including a Digital Preservation Plan
- Creating procedures and documenting workflows for digitization and the acquisition of born-digital materials
- Selecting and implementing an offsite preservation storage solution

I am glad to have had the opportunity to work with the Library on this project. It was a pleasure to spend time with the staff and to learn about the various collections, and I look forward to assisting Library with other initiatives. If this report has raised any questions, or if I can provide any additional information, please do not hesitate to contact me.

Respectfully submitted,

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APPENDICES

A. Implementation Roadmap

All of the recommendations in this report are compiled below and organized as short, medium, and long-term goals. Recommendations within the short, medium, and long-term categories are listed as they appear in the report. This organization of the recommendations is based on the consultant's observations and understanding of the Library's current needs and goals. The timeframes are intended to be starting points for activities, not a suggestion that all activities should be completed within the listed periods. This list should be reviewed and adjusted as needs or priorities change in the coming months.

Short-term (6 - 12 months)

The Organization

- Define and document how digital preservation goals and activities are aligned with the organization mission, values, and vision
- Maintain and formalize current core digital preservation team structure

Staff and Resources

- Hire additional staff to focus on processing physical collections and digitization activities
- Increase baseline digital preservation knowledge and skills for key staff members

Policy Infrastructure

- Define and document a vision and set of shared goals for digital preservation
- Define and document technical specifications for digitization of different content types

Processes and Workflows

- Document local digitization procedures and ensure alignment with digitization and digital preservation best practices
- Create documentation for high priority workflows and procedures

Technological Resources

- Develop and document formal procedures to describe ongoing IT support activities
- Define and document preservation storage criteria
- Document and identify gaps in current information security policies and practices

Medium-term (12 - 24 months)

The Organization

- Conduct an information gathering project with audiences to learn more about their needs related to digital collections

Staff and Resources

- Increase and enhance core digital preservation staff knowledge and skills in specific areas
- Join and participate in a digital collections and/or digital preservation focused community of practice
- Draft an annual budget for digital preservation program based on current cost categories and estimates for future activities
- Pursue grant funding to support digitization and collections processing activities

Policy Infrastructure

- Update the Collecting policy documents to address digital materials
- Define assessment criteria for born-digital acquisitions
- Develop an initial Digital Preservation Plan
- Define and document metadata standards and requirements for digitized materials

Processes and Workflows
- Establish and document a workflow and procedures to stabilize born-digital materials acquired from external donors
- Establish guidelines to create, manage, and preserve standards-based metadata for all digital objects
- Develop procedures to guide the creation of descriptive metadata for born-digital materials in archival collections

Technological Resources
- Conduct an inventory of existing digital materials including those on legacy electronic media
- Maintain a dedicated computer workstation to conduct digital preservation tasks
- Research, explore, select, and implement software tools to support baseline digital preservation tasks
- Evaluate, select, and implement a preservation storage solution
- Conduct systematic fixity checks of digital objects in storage
- Start maintaining access logs for digital materials in preservation storage

Long-term (3 - 5 years)
The Organization
- Expand digital preservation governance group when ready to engage with other campus stakeholders

Policy Infrastructure
- Develop a records retention policy to guide the transfer of materials to the Special Collections from other College departments
- Conduct annual review of selection for digitization policy

B. Example Preservation Actions and Tools

Preservation Actions	Tool Options
Transfer content over network	Bagger
Transfer content from removable media	BitCurator, Data Accessioner
Virus check all content; isolate content for quarantine as needed	ClamAV
Document file formats and other essential content characteristics including how and when these were identified	DROID

Generate integrity information if not provided with the content	Fixity Pro
Create preservation packages	Bagger

C. Example Preservation Storage Criteria

Criteria Name	Description	Category
Integrity checking	Performs verifiable and/or auditable checks to detect changes or loss in or across copies (e.g. checksum recalculation, fixity checking, identifying missing files)	Content integrity
Cost-efficient	Costs relatively less overall than other comparable solutions, by being designed with cost efficiencies, for example, has resource pooling and sharing, multi-tenancy (multiple users share the same applications)	Cost considerations
Replication	Has documented ability to create redundant, distributed copies of content in reasonable timeframes	Information security
Geographical independence	Stores multiple redundant copies in geographically-separate locations,at sufficient distances apart, that are not prone to the same natural and human-made disasters and risks	Information security
Access controls	Provides role-based, access controls for storage infrastructure, e.g. user, staff, admin, to ensure only the appropriate people have the appropriate levels of access	Information security
Security protocols	Includes protective measures, controls,and documented procedures to prevent security incidents related to hardware, software, personnel, and physical structures, areas and devices.	Information security
Virus/malware detection	Includes software that regularly runs virus checks and malware detection.	Information security
Recovery and repair	Reviews and replaces or repairs missing or corrupt files in acceptable time frames, in a manner that does not propagate errors; or provides ability and tools to perform these actions independently, e.g. by the content-owning institution	Resilience
Complete exports	Supports the bulk exporting of content and metadata for any reason, at an acceptable rate,	Scalability & performance

	for example, as part of an exit strategy	
Scalable to large data sizes	Able to support very large amounts of content, in terms of number and size of files, and overall volume	Scalability & performance
Supports expansion	Can increase storage capacity over time as needed in accordance with any SLAs	Scalability & performance
Data error notification	Notifies content-owners of all data errors, remediation actions and issues in reasonable/expected/negotiated timeframes	Transparency
Content reporting	Provides reports about content in the storage infrastructure (e.g. number of objects/files/formats, average file size, types of objects, size of storage in use)	Transparency

D. Resources and Vendors

Throughout the report, I have included examples of resources and vendor-supplied items in order to provide guidance and to show examples of equipment and software that may be helpful to the digital preservation program. Equipment and software tools are available from multiple vendors and technology changes quickly, so this list should not be considered exhaustive. Examples of particular items are intended as illustrations, not recommendations of one supplier over another. The listed resources and other further reading include the following:

Foundational Information

- Yakel, Elizabeth. *Starting an Archive.* https://babel.hathitrust.org/cgi/pt?id=mdp.39015032709209&view=1up&seq=1.
- NEDCC offers training through workshops, and webinars www.nedcc.org/prestr and an annual digital preservation training conference called Digital Directions https://www.nedcc.org/preservation-training/dd23.

Policy

- Association of Research Libraries. 2012. Research Library Issues (no.279). http://publications.arl.org/rli279/.
- Dartmouth College Library. 2015. “Digital Preservation Policy.” https://www.dartmouth.edu/~library/preservation/docs/dartmouth_digital_preservation_policy.pdf.
- Digital POWRR. 2014. “From Theory to Action: Good Enough Digital Preservation for Under-Resourced Cultural Heritage Institutions.” https://powrr-wiki.lib.niu.edu/images/a/a5/FromTheoryToAction_POWRR_WhitePaper.pdf.
- Digital Preservation Business Case Toolkit. 2014. http://wiki.dpconline.org/index.php?title=Digital_Preservation_Business_Case_Toolkit
- National Archives. *Developing a Digital Preservation Strategy and Policy*. https://bit.ly/2NB97a2.

- Noonan, Daniel W. 2014. “Digital Preservation Policy Framework: A Case Study.” http://er.educause.edu/articles/2014/7/digital-preservation-policy-framework-a-case-study.
- The Odum Institute for Research in Social Science. 2017. Policies and Guidelines. https://odum.unc.edu/archive/about/.
- Purdue University Research Repository. “PURR Collection Policy.” https://purr.purdue.edu/legal/collection-policy.
- Research Libraries of Illinois (CARLI). “Digital Collection Development Policy.” https://www.carli.illinois.edu/products-services/contentdm/dig-coll-colldevpolicy.
- Redwine, Gabriela et al. 2013. “Born Digital: Guidance for Donors, Dealers, and Archival Repositories.” https://www.clir.org/wp-content/uploads/sites/6/pub159.pdf.
- Rinehart, Amanda Kay et al. 2014. “Overwhelmed to Action: Digital Preservation Challenges at the Under-resourced Institution.” https://digitalpowrr.niu.edu/wp-content/uploads/2014/05/Overwhelmed-to-action.rinehart_prudhomme_huot_2014.pdf.
- Rollins College. 2017. “Special Collections and Archives Four-Year Strategic Plan.” https://www.rollins.edu/library/docs/planning/ArchivesPlan2017-2020.pdf.
- Society of American Archivists. 2013. *A Guide to Deeds of Gift.* https://www2.archivists.org/publications/brochures/deeds-of-gift.

Staffing & Professional Development

- Cornell University and Massachusetts Institute of Technology Digital Preservation Management Workshops. http://www.dpworkshop.org/workshops/fiveday.html.
- DgCCurr Professional Institute: http://ils.unc.edu/digccurr/institute.html. See CurateGear event through this group.
- NDSA Standards and Practices Working Group. 2013. Staffing for Effective Digital Preservation: An NDSA Report. http://www.digitalpreservation.gov/documents/NDSA-Staffing-Survey-Report-Final122013.pdf.
- Preservation and Archiving Special Interest Group. http://www.preservationandarchivingsig.org/.
- Preserving Digital Objects with Restricted Resources (POWRR). http://digitalpowrr.niu.edu/news/.

Reformatting & Selection

- Cornell Library. “Moving Theory into Practice: Digital Imaging Tutorial.” http://preservationtutorial.library.cornell.edu/quality/quality-02.html.
- Dartmouth College Library. “Selection Policy for Digitization Projects.” https://www.dartmouth.edu/~library/digital/about/policies/selection.html?mswitch-redir=classic.
- Digital Preservation Coalition. “Legacy Media.” https://www.dpconline.org/handbook/organisational-activities/legacy-media.
- Digital Intelligence. USB Write Blocker. https://digitalintelligence.com/products/ultrablock.
- Federal Agency Guidelines for Digitization Initiative (FADGI). 2016. *Technical Guidelines for Digitizing Cultural Heritage Materials*. http://digitizationguidelines.gov/guidelines/FADGI%20Federal%20%20Agencies%20Digital%20Guidelines%20Initiative-2016%20Final_rev1.pdf.

- Library of Congress. “Sustainability of Digital Formats: Planning for Library of Congress Collections.” http://www.loc.gov/preservation/digital/formats/.
- Library of Congress. 2019. “Recommended Formats Statement.” http://www.loc.gov/preservation/resources/rfs/TOC.html.
- Minnesota Historical Society. 2016. *Digital Imaging for the Small Organization*. https://www.mnhs.org/sites/default/files/preservation/grants/guidelines_digital_for_small_organizations.pdf
- NDSA. “Levels of Preservation V2.0.” https://ndsa.org/activities/levels-of-digital-preservation/.
- Smithsonian Institution Archives. “Digital Video Preservation.” https://siarchives.si.edu/what-we-do/digital-curation/digital-video-preservation.
- Sustainable Heritage Network. “Copystand Equipment and Setup [Tutorial].” https://sustainableheritagenetwork.org/digital-heritage/copystand-equipment-and-setup-tutorial.

Technological Infrastructure

- Community-Owned Digital Preservation Tool Registry (COPTR). http://coptr.digipres.org/Main_Page.
- Digital Preservation Coalition. “Storage.” https://www.dpconline.org/handbook/organisational-activities/storage.
- Digital Public Library of America. 2014. Metadata Application Profile. https://pro.dp.la/hubs/metadata-application-profile.
- Duracloud storage. http://www.duracloud.org/.
- Internet Archive Vault. https://webservices.archive.org/pages/vault
- Digital Bedrock. https://www.digitalbedrock.com/
- Library of Congress. “Understanding Premis.” https://www.loc.gov/standards/premis/understanding-premis.pdf.
- “Outfitting a Born-Digital Archives Program,” *Practical Technology for Archives*, Issue No. 2 (June 2014): https://ecommons.cornell.edu/server/api/core/bitstreams/84876361-2d1a-449d-a83a-96153727441c/content.
- Phillips, Megan, Bailey, Jefferson, Goethals, Andrea and Owens, Trevor. “The NDSA Levels of Digital Preservation: An Explanation and Uses.” http://www.digitalpreservation.gov/documents/NDSA_Levels_Archiving_2013.pdf.
- Van Malssen, Kara. “Implementation of systems for Media/Digital Asset Management in 10 Steps.” http://www.slideshare.net/kvanmalssen/implementation-mam-10steps/.

E. Glossary

Access File: A compressed version of a digital object intended for access and use by patrons.

Access Point: A means through which collections are accessed. In the case of digital collections, this may be a URL.

Analog Object: An object that is made of physical material. This term is often used in contrast to the term “digital object.”

Authenticity Check: The process of ensuring that a file is what it is expected to be and has not been altered, corrupted, or damaged in any way. Also known as “fixity check.” See: Fixity.

Backup: A complete copy of a file that is stored and preserved for the purpose of replacing the master file in the case of data loss.

Born-Digital: Describes an object originating in electronic form as opposed to an object originating in an analog, or physical, form.

Checksum: An alphanumeric value that is generated and assigned to a digital object and used to validate the object’s integrity.

Compression: The reduction of file size for processing, storage, and transmission. Image and sound quality may be affected by the compression technique or the amount of compression. There are two types of compression, lossless and lossy.

Compression, Lossless: This type of file compression reduces the storage space needed without loss of data. For example, an image compressed by lossless compression is identical to the original image.

Compression, Lossy: This type of file compression reduces the storage space needed by discarding information that is considered redundant. This loss of data is often not perceptible to the human eye at normal resolution.

Consortial Website: An internet site through which associated or partnered institutions collaboratively provide access to digital content.

Collection Management System: A software or platform intended to facilitate the management of and access to digital files. Common examples include, but are not limited to, CONTENTdm and ArchivesSpace. Sometimes referred to as a Content Management System.

Cloud Storage: A service model in which digital content is managed, backed up remotely, and made available to users over the internet.

Database: A structured data set designed to facilitate the organization of and ease of access to information.

Dedicated Workstation: In the context of digital preservation, this is a local computer or laptop station through which users are given access to digital content that is typically stored on an internally shared drive or external hard drive.

Digital Collection: A grouping of electronic objects. Digital Collection may refer to an institution's entire repository of electronic files or to a subset of files.

Digital Resource: This is an item existing in electronic form that may contain any variety of content such as simple text, still image, video, or audio. Also referred to as a digital file, digital asset, digital object, or digital material.

Digital Preservation: The practices involved in stewarding electronic content, such as files, for future access.

Digitization: The act of reformatting an analog object into a digital object.

External Media: Peripheral storage devices that are not housed within the computer and that can be removed or added to the computer as needed to access the stored content. Examples include floppy disks, optical discs, and USB drives.

Emulation: The alteration of a computer so that it can run software in a way that appears as if the software were running on the original hardware for which it was designed.

File Format: A particular way that data is arranged in a file so that it can be read by computer software. Examples include JPEGs, TIFFs, and Word DOCs.

Fixity: The state of remaining unaltered. This term is used to characterize the ideal, unchanged state of digital objects. See: Authenticity Check.

Information Technology (IT): The use of computer systems for storing, retrieving, and sending electronic data.

Legacy Carrier: Storage media that is considered obsolete. Examples include floppy disks, some magnetic tape formats, and optical discs.

Master File: A complete version of a digital object intended for long-term storage and preservation.

Metadata: Structured information that helps to describe, manage, preserve, retrieve, and deliver a digital object.

Metadata Schema: A standardized series of fields used to characterize a digital object. Metadata may be generated in-house or copied from external standards, which include, but are not limited to, Dublin Core, PBCore, and MODS.

Metadata, Administrative: Metadata created for the purpose of the internal management of digital resources.

Metadata, Descriptive: Metadata created for the purpose of identification, searching, and retrieval. It is the equivalent of cataloging for digital collections.

Metadata, Structural: Metadata created for the purpose of describing relationships between different components of a digital object. It enables display and navigation.

Metadata, Technical: Metadata created for the purpose of describing the attributes of a digital file.

Migration: The practice of transferring digital content from one piece of hardware to another, or from one format to another, typically to avoid damage or loss due to obsolescence.

Open Source: Denotes software whose source code is available to the public for free. This term is often used in contrast to "Proprietary" software, whose source code is privately owned.

Physical Carrier: The hardware used to store digital content. Examples include solid state drives, CD's and DVD's, DAT Tape, and spinning disk hard drives.

Quality Control: A review intended to ensure that items and procedures meet predetermined standards.

Recovery: The restoration of lost data from failed hardware.

Reformatting: The act of digitizing an analog object into a digital object.

User Permissions: The privileges given to users that allow them to conduct a number of operations effecting digital files. Permissions may include the ability to view, edit, move, or download content.

Sources:
https://www.nps.gov/museum/publications/conserveogram/22-06.pdf
https://www2.archivists.org/glossary
https://dptp.london.ac.uk/mod/glossary/view.php?id=2322

F. Why Digital Preservation?

Increasingly, historically and institutionally significant collections at libraries, archives, and museums include digital content. As with physical collections, these institutions are responsible not only for collecting and interpreting these materials, but also for their long-term preservation, security, and access. Digital preservation encompasses the practices involved in the successful stewardship of this electronic content. These practices can be applied to any digital object, whether it is born-digital or digitized, and across a range of complexities, from a simple text document to a relational database.

i. Digital Preservation Challenges

Digital preservation is necessary because the files cultural heritage institutions keep face a variety of risks. If left alone, they are not likely to survive intact into the future.

Key risks include:

- **Media obsolescence** – This is when storage media, such as tape, floppy disks or CDs become obsolete and the hardware necessary to read them is no longer readily available. For example, while CDs were once ubiquitous, most new laptops are not equipped with a disc drive.
- **Media failure** – Storage media is a commodity product and tends to have a reasonably short lifespan. Hard disk drives begin to fail more frequently after 3–5 years, and like all physical materials, poor environmental conditions and mishandling can damage storage media. This can lead to the data on a device becoming corrupted or making the whole device inaccessible without advanced recovery techniques. When a series of non-critical failures occur, and bits in the data are "flipped" from 1 to 0 or vice versa, this can lead to the gradual corruption of files known as "bit rot," which can be difficult to detect without carefully managing and monitoring files on storage media.
- **Disasters** – Disasters that damage digital data can come in many forms including fire, flood, and other natural disasters, as well as human-engineered issues such as computer viruses and malicious attacks.
- **Format obsolescence** – File formats can become obsolete as newer generations of software are introduced or as software is discontinued altogether. While backwards compatibility allowing newer software to interpret legacy materials may be available for commonly used programs, this is not always the case for less widely adopted programs or proprietary software—particularly from smaller companies.
- **Loss of context** – As collections of digital files grow, it becomes more difficult to recall the history of each file or group of files without a system for describing them in place. This issue can be exacerbated as more time passes, staff turnover occurs, or the collection of digital files is transferred from one organization or person to another.
- **Loss of authenticity** – Data may cease to be an accurate representation of its original self through data loss or alteration of the file. This can occur when the file's content is manipulated or the metadata embedded within is erased or changed, and a person may do this willfully or unknowingly. Alterations or loss of data can occur as files are transferred, but may not be entirely clear to the casual observer. In fact, it may require massive manual effort to determine if any data within a digital collection has been damaged, unless some care is taken to manage and preserve the data properly.

It is important to remember that the risks described above are always present, but that additional problems may arise whenever a digital collection is moved, processed, curated, or altered in some way.

These problems may include:

- **Network dropouts** – Network dropouts may occur at critical times, such as in the middle of moving a large number of files. This can damage files or result in an incomplete transfer of data.
- **Lack of storage capacity** – Without careful planning, storage disks can get full and any subsequent data copied there can be lost.
- **Software bugs** – Bugs in software can lead to unexpected results, including changes to files and data copied to unknown locations.
- **Human error** – Oftentimes, the biggest danger is human error. A simple loss of concentration can lead to problems like the accidental deletion of files.

It is also important to remember that these problems can be multiplied many times over when doing things at scale, such as when migrating existing data to a new storage solution.

Fortunately, steps can be taken to mitigate these risks and ensure the safe stewardship of digital collections, such as through the appropriate management of digital storage solutions, maintaining backups of data, and monitoring for file fixity.

ii. Digital Preservation Benefits

Organizations that address the need to care for their digital collections can expect several benefits for their organization, including:

- **Protecting investments** – This is true for digitized material and born-digital files. When content is digitized under the care of a digital preservation program, files are made at a high quality and to standards that support their preservation. These factors—and the strategies used to address the challenges above—mean that an organization will be less likely to need to digitize materials again, saving themselves time and resources. For born-digital content, caring for files still on legacy media like floppy disks also means that the initial time spent cataloging or storing these materials will not go to waste.

- **Preserving content on unstable physical materials** – For some particularly vulnerable objects, like audiocassettes, VHS tapes, and newspapers, the only way to ensure long-term access to their content is to digitize the materials and care for the resulting digital files. Preserving and providing access to digital copies of these materials will also reduce the need to provide access to the physical original, which poses its own preservation risks for these fragile objects.

- **Gaining the ability to care for "today's history" before it is too late** – Since 1997, information scientists have warned that we are living in what may come to be known as "the digital dark age," a time in which great quantities of historical materials will be lost because the organizations of our time were unequipped to care for them.[6] Establishing a digital preservation program now will mean that the emails written today remain available

[6] Kuny, Terry. "A Digital Dark Age? Challenges in the Preservation of Electronic Information." 1997. http://archive.ifla.org/IV/ifla63/63kuny1.pdf.

long enough to be studied in the future, just as the letters written hundreds of years ago are studied today.

- **Efficient use of resources** – Organizations with a mature digital preservation program will more easily retrieve and utilize digital content, whether this is for researchers, an auditor, another department within their organization, or an inter-organizational project that involves the use of digital objects from many organizations. Having a system in which digital content is centralized and backed up according to a plan also means that digital storage space will be used optimally, and fewer, irrelevant versions of a single file will be stored.

- **Wider Access to Content** – Digital preservation programs empower organizations to serve a broader audience, whether this includes individuals who are unable to travel for research or the organization's building is closed during a crisis. Stewarding accessible digital content increases an organization's reach and provides an alternative means of access when in-person research is impossible.

CONCLUSION

While there are many challenges associated with the preservation of digital materials, digital preservation practices can be implemented to ensure successful stewardship of digital content and collections. Doing so allows institutions to document and care for their digital materials, while providing enduring access to our collective digital heritage.