



National Digital Stewardship Residency | New York
Final Report
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Host: Carnegie Hall Archives

Born-Digital Asset Management and Preservation Policies

NDSR FINAL REPORT

**Carnegie Hall Digital Archives Project:
Born-Digital Asset Management and Preservation Policies**

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Description of the Project

Project Title

Carnegie Hall Digital Archives Project: Born-Digital Asset Management and Preservation Policies

Project Overview

The scope of my project was fairly large and encompassed both higher-level preservation planning as well as “hands-on” work with born-digital materials. My project objectives were ultimately focused on developing preservation and sustainability policies for born-digital assets. However, the root issue that my NDSR project was designed to address is that there hadn’t been a streamlined process at Carnegie Hall for staff to push digital assets and their associated metadata upstream. My project sought to mitigate this issue by establishing policies and procedures that will address this situation going forward. Consequently, not only was my project intended to make an impact on the Carnegie Hall Archives (CHA) staff, but hopefully on everyone at Carnegie Hall involved in the creation or use of digital media.

My NDSR project focused on three distinct areas, the first of which was configuring and implementing Cortex, Carnegie Hall’s new Digital Asset Management System. This required working closely with CHA’s consultants, AVPreserve. It also required being in close contact with Orange Logic, Cortex’s developers, to ensure that the DAMS was tailored to fit Carnegie Hall’s unique set of needs.

The second area of focus was on designing workflows for the creation and management of born-digital assets. This entailed the creation of file naming conventions and other pre-ingest workflows, tracking down all extant born-digital assets from both vendors and internal staff, and developing a set of requirements for the long-term preservation and sustainability of digital files.

The third area of focus was on developing policies and procedures for digital preservation. This included tasks like improving CHA’s documentation practices, determining the scope of CHA’s preservation efforts, designing internal policies for the creation, storage and use of digital assets, and developing selection and acquisition criteria for the DAMS.

Project Results

It was always important to me that I had both an objective and subjective way of measuring my project’s success. At the outset of the residency I came up with two separate metrics that would allow me to evaluate my work. The first was simply whether or not I would be able to produce all of my project deliverables. This was a straightforward, objective metric that allowed me to track my progress throughout the course of the project.

The second criterion that I used was whether or not I would feel at the project’s end that it had made a lasting impact on my host institution. Admittedly this metric is less precise. Nevertheless this is designed to be a subjective metric, so I decided that allowing some room for interpretation was OK.

According to both of these criteria my project was a success.

Responsibilities and Deliverables

My NDSR project was especially broad in scope. I had 9 deliverables in total that ranged from more self-contained tasks--like making recommendations for improving file naming conventions--to much more in depth projects that required months of writing and revision. I was able to achieve all

of my project deliverables save for one, which I was unable to complete due to delays in the launch of Carnegie Hall's new DAMS (this is discussed below at greater length).

Phase 1 – Months 1-3 (Mid-September – Mid-December): Conduct interviews with stakeholders (i.e., departments that produce digital content) to evaluate current workflows and digital usage and create detailed inventories of existing born-digital assets.

Deliverables:

- Detailed inventory of born-digital assets ✓ (*NOTE: this task was altered somewhat midway through Phase 1 to make it more achievable and useful to the Digital Archives Project*)
- NDSR Interim Report Part I ✓
- Document initial workflows ✓
- Recommendations on how to improve file naming & pre-ingest workflows (First draft) ✓
- Disaster plan (First draft) ✓

Phase 2 – Months 4-6 (Mid-December – Mid-March): Analyze workflows; review inventory; use inventories of born-digital assets to inform requirements and recommendations for long-term preservation and sustainability of digital files; select assets and gather metadata for ingest; begin to draft Digital Preservation & Sustainability policy; create a workflow for ingesting born-digital assets into the DAMS; make recommendations on how to improve file naming and other pre-ingest workflows.

Deliverables:

- Recommendations on improving file naming and other pre-ingest workflows (Final) ✓
- Document workflow for ingesting born-digital assets into the DAMS (First draft) X
- Digital Preservation & Sustainability document (First draft) ✓
- Document detailing selected assets/metadata for test ingest ✓
- NDSR Interim Report -- Part 2 ✓

Phase 3 – Months 7-9 (Mid-March – Mid-May): Create a Digital Preservation & Sustainability document for the policies, procedures, best practices, and workflows for management of digital files; set selection and acquisition policies for born digital assets.

Deliverables:

- Digital Preservation & Sustainability document (Final draft) ✓
- Tested and documented workflows and best practices for the preservation and management of born-digital assets (Final draft) ✓
- Document detailing selection and acquisition policies for born digital assets (Final draft) ✓

Description of Project Partners

AVPreserve are Carnegie Hall's consultants for the Digital Archives Project. I interacted with them on a weekly basis throughout the project.

Orange Logic is the developer of Cortex, Carnegie Hall's new digital asset management system. I interacted with Orange Logic on a weekly basis throughout the project.

Additionally I also interviewed and interacted with a wide range of Carnegie Hall staff outside the Archives, including IT, Interactive Services, e-Strategy, Public Relations and WMI (the Weill Music Institute). Each of these departments is considered a Digital Archives Project stakeholder.

Project Execution

Activities Completed

Below is a list of the activities completed as part of my NDSR-NY project:

- Detailed inventory of born-digital assets ✓

This task was intended to be a prerequisite for making selection and acquisition criteria as my project was originally conceived. However, as I began this task it quickly became apparent that soon forced my mentors and I to rethink this approach.

There were several hurdles that stood in the way of accomplishing this task. The most significant of these were the amount of duplication and versionality of files at Carnegie Hall: a substantial percentage of files existed in a number of different versions, and even the files' creators had trouble distinguishing one from the next. Another challenge was the way that the file directories were set up at Carnegie Hall. Both the structure and permissions of the network directory made accessing certain files difficult.

For these reasons, as well as for the sheer number of born-digital assets within the organization, it was determined that I should shift my focus to completing an inventory of the extant removable media around the organization containing born-digital information. Limiting the scope of this task made it much easier to accomplish in the allotted time. But crucially, I was still able to use the information garnered during this task to produce selection and acquisition criteria.

- Document initial workflows ✓

To accomplish this task I scheduled a series of interviews with stakeholders from every department at Carnegie Hall that creates or uses media. During these interviews I had every stakeholder walk me through their workflows from beginning to end. I recorded these interviews and translated the recordings into workflows for each department.

- Recommendations on how to improve file naming & pre-ingest workflows ✓

This was one of the first projects I completed during my residency. In addition to creating a clear set of general guidelines for every file type, I also created a set of file naming conventions that were specific to each department. I included the file naming conventions within the Digital Preservation & Sustainability document (see below).

- Disaster plan ✓

I created a comprehensive disaster preparedness plan for the Carnegie Hall collections. The plan is aimed at the prevention, preparedness, and response to issues that may threaten the collections—both physical and digital. No disaster plan had existed prior to this at Carnegie Hall.

- Document workflow for ingesting born-digital assets into the DAMS X

Developing a workflow for ingesting born-digital assets into the DAMS was the only deliverable that I was not able to complete. The Digital Archives Project experienced several setbacks in the fall and winter that ultimately changed the timeline for the local installation of the DAMS at Carnegie Hall. So while I was able to ingest many test assets as well as discuss what these workflows would look like with my colleagues on many occasions, I was not able to document a workflow for testing these ingest procedures myself.

- Ingest selected test assets/metadata ✓

Test assets and metadata were ingested into the DAMS throughout Phase 3 of my project.

- Best practices for the preservation and management of born-digital assets ✓
This information is included in the Digital Preservation & Sustainability document (see below).
- Document detailing selection and acquisition policies for born digital assets ✓
Based on my interviews with stakeholders I was able to determine a set of recommended selection and acquisition criteria. I included the selection and acquisition criteria within the Digital Preservation & Sustainability document (see below).
- Digital Preservation & Sustainability document ✓
This document will serve as the foundation for Carnegie Hall's digital preservation policy. In addition to containing institution-wide file naming conventions and selection and acquisition criteria that detail what types of assets will be ingested into the DAMS from across the organization, this document also includes a variety of recommendations designed to increase Carnegie Hall's capacity for sustainable, long-term digital stewardship.

Significant Accomplishments

In terms of project work, there are several significant accomplishments that I feel are worth noting. The first is the creation of a Disaster Preparedness Committee. This is a standing committee charged with overseeing, updating, and administering the Disaster Preparedness Plan—including securing authorization of funds for immediate salvage and recovery efforts should a disaster occur—in order to better protect Carnegie Hall's archival collections.

The committee is comprised of five members whose appointments to the committee are based on peer nomination. These include two representatives from Archives and one representative each from I.T., Buildings Administration, and Senior Staff. The committee will meet annually to review the Disaster Preparedness Plan and coordinate training for new members of staff. In addition to increasing awareness among staff about emergency preparedness, the creation of this committee will help make my work in this area sustainable.

But the Disaster Preparedness Plan could never have been written were it not for a collaborative effort that I devised between the Archives department at Carnegie Hall and graduate students enrolled in a Master's level 'Conservation and Preservation' course at NYU's Moving Image Archiving and Preservation program. Archival collections assessment is an important component of a successful collections management program and is a pre-requisite for developing an effective disaster preparedness plan. In most institutions, however, conducting an assessment of the risks to a collection is feasible only with additional resources.

For this and a number of other reasons, collections assessment has not been a regular part of collections management practice at Carnegie Hall. This collaboration allowed Carnegie Hall to receive a comprehensive collections assessment at no cost to the institution while simultaneously ensuring that graduate students receive hands-on training preparing the report. In addition to aligning with Carnegie Hall's mission to engage with and provide educational opportunities for students, this collaboration provided a comprehensive collection assessment that ultimately provided the basis for the Disaster Preparedness Plan that I wrote.

Another important accomplishment was rewriting the Archives' mission statement to include a mandate specifically for digital preservation. Although this was not one of my project deliverables, from the outset of my residency I felt that establishing digital preservation as part of the Archive's mission in writing would be hugely beneficial. I requested permission to update the mission statement as soon as my residency began. My mentors were extremely receptive to this idea. I

worked with the entire Archives staff throughout the first two phases of my residency to update our mission statement as well as to write access and collections and acquisitions policies. These may now be viewed on Carnegie Hall's [website](#). This is an important accomplishment because having a mission statement that includes digital preservation will:

- Provide a justification for all preservation efforts in the future
- Bring the Archives in line with digital preservation standards that require this level of explicit commitment
- Provide evidence to grantmaking bodies of Carnegie Hall's institutional commitment to preserving digital information
- Raise awareness of the digital preservation program both within the organization and beyond.

Outreach or Dissemination Activities

Beyond the extensive internal outreach that my project required, in November I also attended the AMIA annual conference in Savannah, Georgia. This gave me the opportunity to discuss the project with colleagues, as well as to meet with some of our vendors.

I also attended the Preservation and Archiving Special Interest Group conference in March, which took place in San Diego, California. Vicky Steeves and I co-presented on the NDSR-NY program as well as on our respective projects. This conference provided me with an excellent platform for conducting outreach and allowed me to connect with a number of professionals in the field embarking on similar projects at their own institutions.

Another outreach opportunity was an event co-sponsored by [ARLIS/NY](#) and [Metro](#) in March at which the entire cohort had the opportunity to present about our respective projects.

Finally, another outreach opportunity worth mentioning was a presentation and demonstration I gave in June at a meeting for internal stakeholders at Carnegie Hall. This provided me with a chance to talk to Digital Archives Project Core Team members and show them the progress that I made during my residency.

Analysis and Evaluation

Project Results

Overall my accomplishments align with the intended project results.

There was only one deliverable that I was not able to achieve, and this was due to project delays beyond my control. But beyond the project deliverables themselves, I feel that my project was a success for two reasons: First, because it catalyzed a number of important conversations within Carnegie Hall about digital preservation within the organization, and second, because of how much I learned throughout my residency at Carnegie Hall.

The discussions I had with staff members throughout the organization during the interview process helped the Archives team understand in much greater detail how digital media is created, used, and stored at Carnegie Hall. This gave us a better understanding of how each department would ultimately interact with the DAMS, and allowed us to better anticipate what each department's unique set of needs would be. This helped create buy-in throughout the organization and it also helped spark a number of important conversations about the role that digital preservation would play in my colleagues month-to-month routines.

In addition to bolstering staff participation and awareness, these conversations also revealed—and ultimately improved—some of the areas in which Carnegie Hall needed to gain better intellectual control over the digital assets in its care. During my interviews with stakeholders I asked colleagues to gather any hard drives, thumb drives, optical media etc. that they thought might contain digital assets. We would review their contents together so I had a clear understanding of the kinds of material that they contained. Many (in fact, most) of the removable media I collected contained unique material that was not backed up anywhere else. After explaining to my colleagues why and how this presented a risk, I took the removable media back to Archives where I backed its contents up to an actively monitored network drive, which is in turn backed up to an off-site cloud storage facility.

This was extremely helpful for my colleagues, who in almost every case ended up discovering copies of files that they had long since assumed to be lost, thus underscoring the Digital Archives Project's value. But in addition, conducting this kind of outreach was an invaluable learning experience because it challenged me to become adept at explaining digital preservation to those outside the field, and to find new ways of conveying why this work matters. This is a skill that can be difficult to learn early on in one's career, but it is crucial to success in this field. Even in the short time that has passed since the residency's end I have already found myself employing this skill in job interviews, project proposals, and presentations.

My only regret is that the residency was not longer, since I feel that I would have been able to do more in the way of implementing policies. Many of the recommendations that I made in the Digital Preservation and Sustainability document exist merely as recommendations and not policies simply because making these decisions require participation from creators and users of digital assets at Carnegie Hall. I strongly believe that digital preservation policy decisions will not be successful if they have been made unilaterally and without the participation and support of those who will be most affected by them.

The short time period in which the residency took place meant that I did not have sufficient time to meet with colleagues, discuss all the policies I would like to implement, hear their feedback, and incorporate their concerns into the final policy document. Therefore, rather than impose a set of policies onto my colleagues, I created a series of recommendations that will—I sincerely hope—serve as a roadmap for a robust set of digital preservation policies. Had this project been year-long rather than only 9 months, this might be different, but I was limited by the time constraints under which I was working.

In addition to the heightened awareness of and broader staff participation in digital preservation that my NDSR project sparked, one of the most significant project achievements was the Digital Preservation and Sustainability document that I created. This document clearly establishes a path toward sustainable long-term stewardship and establishes a foundation upon which digital preservation policies can be created.

Unanticipated Circumstances

Although my project was ultimately extremely successful, it was not completely free of hiccups. The most significant unanticipated circumstance that created an obstacle to the project's success occurred roughly a month into my project when one of my two mentors resigned from the Archives.

Although my residency had been largely self-directed even when the Digital Project Manager, was still at work, in her absence it became even more so. Kathleen Sabogal was a wonderful mentor and she certainly made me feel supported and welcomed at Carnegie Hall. But without the Digital

Project Manager there, certain aspects of my project—like the ability to ask for input about issues and questions specifically related to digital preservation—became more trickier.

However, there was also an upside to this: it meant that I had to take charge and find out the answers to any questions that I had rather than simply asking the Digital Project Manager. Having to quickly make the transition from being actively mentored to self-driven helped me take ownership of the project and mold it into something that I am proud of.

The most significant outcome of the Digital Project Manager's absence was that after she resigned, Carnegie Hall approached me about taking over her position. After some negotiation, between Metro and Carnegie Hall, the final solution was that, effective the first week in January, I would assume the Digital Project Manager's position 2 days per week and would continue with my residency the other 3. This meant that I had less time to complete more work—that is, all my original NDSR project deliverables in addition to managing the Digital Archives Project.

Nevertheless, the experience I gained during the final 5 months of my residency has been invaluable, and I'm grateful to have had the opportunity to step into the Digital Project Manager role. It dramatically enhanced my skillset, particularly in the area of project management. It also allowed me to gain much more hands-on project experience, which in turn helped many aspects of my NDSR project. So although this was certainly was an unanticipated shift in my project, it was not necessarily worse off for it.

Another unexpected shift in my project was a delay in our DAMS project that ultimately extended the timeline beyond what had been anticipated at the project's beginning. This was due to a number of factors including the extensive changes that needed to be made to the underlying data structure of the DAMS throughout the project. This unforeseen delay meant that I was unable to develop ingest workflows for born-digital assets because for the majority of my project the DAMS simply wasn't at a point where it made sense for me to do this. I did have the opportunity to test the ingest process for a number of selected test assets/metadata, but I did not have enough time to develop these for each department/asset type.

Impact

This project has made a substantial impact on Carnegie Hall. Prior to my arrival, there was no disaster preparedness plan in place and no clearly articulated set of digital preservation policies. I created both of these documents over the course of my residency, and the policies I was able to put into place will make a substantial difference on a month-to-month basis. These will contribute to a much more robust digital preservation program and will measurably increase Carnegie Hall's capacity for digital stewardship.

Before my project began, many of my colleagues would regularly store their unique media assets on removable media that often sat in their desk drawers for many months—sometimes even years—on end. As a part of the interview process I made it a priority to gather this media, bring it back to Archives, and make sure that it was backed up to an actively monitored server that is regularly backed up to the cloud.

Not only that, but over the course of my residency I was able to successfully educate my colleagues about the risks involved in this practice. Now, instead of storing their media in this manner staff members from across the organization regularly bring their media to Archives so that it can be backed up and stored appropriately. This represents a substantial paradigm shift within the organization. In this vein, my NDSR project has been hugely influential, and its effects will continue to resonate long after my residency ends.

Another area where my project had an impact is the mission statement, access, and collections and acquisition policies that I created for the Archives. Before I arrived there was no official access, and collections and acquisition policies. Although the Archives did have a mission statement in place before I arrived, it was not available to the public and had not been updated in 20 years and did not mention digital preservation at all. Over the course of my residency I worked with the Archives team to write these policies (or re-write, in the case of the mission statement), and suggested that all three be put online. The final, complete versions of these policies are now publicly available on our website.

Not only did creating these policies help bring the Archives in line with international standards and best practices for digital preservation, it also strengthened our digital preservation program by encouraging us to examine our collections and ambitions in the digital realm and articulate a set of policies that we can responsibly and sustainably support.

As a result of the interviews I conducted, the policies and recommendations I made, and the outreach I did both internally and externally, my project will have dramatic impact on the DAMS project and Carnegie Hall at large for years to come.

What's Next

As of this fall I will begin a new position at the UCLA Libraries Special Collections as their Digital Archivist. I will be responsible for facilitating the discovery of and access to digital materials, and for developing and implementing policies and procedures that facilitate the acquisition, preservation, arrangement, description, and access to born-digital materials.

This residency has convinced me beyond any shadow of a doubt that my career will be devoted to digital preservation, which was not necessarily my assumption at the residency's outset. Being completely immersed in digital preservation for the length of my residency was a transformative experience. Without question being a part of the NDSR-NY program has changed the trajectory of my career, and for that I am extremely grateful.

Digital Preservation and Sustainability at Carnegie Hall

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Introduction

In July 2012 Carnegie Hall began the Digital Archives Project. This 3 year-long undertaking, which was jointly funded by the Carnegie Corporation, The Susan and Elihu Rose Foundation, and the Andrew W. Mellon Foundation, is a comprehensive initiative to digitize extensive paper and audio-visual holdings documenting the Hall's 120-year history.

The Digital Archives Project (DAP) has three main objectives: to conserve and preserve Carnegie Hall Archives' (CHA) physical collections, to increase access to archival material online, and to create a central, sustainable repository of our digital assets. To meet the latter objective CHA has embarked on a project to develop policies and procedures for digital preservation. These are outlined in the below document alongside a series of recommendations that will strengthen CHA's digital preservation program, and help guide the transition from a 3 year-long project to a sustainable long-term project.

Purpose and Scope

The DAP is an ambitious project that has ushered in a new era at Carnegie Hall. Going forward, CHA will play a central role in managing and preserving Carnegie Hall's digital assets. As the DAP transitions into a permanent and sustainable long-term digital preservation program, CHA must have a solid understanding of the policies currently in place. They must also have firm grasp of what lies ahead.

The purpose of this document is twofold: it records all the digital preservation policies that CHA has developed throughout the course of the DAP, as well as containing a variety of recommendations pertaining to digital archives standards and best practices that will strengthen CHA's digital archives program.

The policies contained within this document are indicated by **fuschia** text. It should be noted that just as technology changes and adapts over time, so too does the field of digital preservation. Therefore, the policies outlined in this document must be reviewed and updated regularly by Carnegie Hall Archives staff.

The series of recommendations contained within this document all pertain to digital archives standards and best practices. These have been highlighted in **orange** text and appear at the end of most sections. They are also summarized at the end of this report, where they have been categorized as either short-term or long-term projects. These recommendations all focus on extending the current preservation program to bring CHA in line with these standards. In particular, all recommendations made have been based on the Reference Model for an Open Archival Information System (OAIS) ([ISO 14721:2012](#)), which is the current international standard for what is required for an archive to provide permanent or indefinite long-term preservation of digital information, and the Audit and Certification of Trustworthy Digital Repositories (TDR) ([ISO 16363:2012](#)), which was developed to be used in conjunction with the former. All policies and/or recommendations that are OAIS/TDR requirements have been indicated in **red** text.

Mandate

Policy / OAIS/TDR Requirement

CHA's mandate for digital preservation is drawn from the following areas of responsibility:

Preservation of Digital Assets

CHA supports the acquisition and preservation of assets that relate to the origins, history, activities, growth, and development of Carnegie Hall. In addition, CHA serves as the official and permanent repository of historical and inactive records of the Carnegie Hall Corporation. CHA is responsible for identifying and preserving, and making these assets accessible to both Carnegie Hall staff and the public alike.

Organizational Commitment

The Digital Archives Project is a large and multi-faceted project that has involved intradepartmental collaboration. The DAP Core Team, which encompasses staff members from I.T., P.R., e-Strategy, and WMI, has been a key component of the Digital Archives Project from its inception. CHA, with the support and input of the DAP Core Team, should work to establish policies for the preservation of digital assets.

Scope

Policy / OAIS/TDR Requirement

This policy addresses the preservation of digital materials for which CHA is the primary steward. This includes:

- Digital surrogates of legacy archival material created (either internally or via outsourcing) by the CHA that are deemed to be of enduring value
- Unique born-digital materials that have been created by Carnegie Hall staff whose stewardship falls under CHA's mission to preserve

This document will also contain a series of recommendations for CHA that are designed to strengthen their current digital preservation activities, and to guide them toward a framework for a digital preservation program that is sustainable in the long-term.

Objective

Policy / OAIS/TDR Requirement

Digital preservation encompasses a series of activities and processes necessary to ensure continued access to authentic digital materials into the long-term. This includes stabilizing and monitoring digital materials to ensure access to them beyond the limits of media failure or technological change. The objectives in this policy define a framework to:

- Establish and communicate an institutional commitment for digital preservation to the CHA user community, which includes both Carnegie Hall staff and the public at large
- Identify and select digital assets to be preserved, and clarify the levels of preservation the CHA is able to provide for this material

- Maintain a minimum of bit-level preservation for all objects entering the preservation system
- Adhere to best practices for the preservation, acquisition, access, and ongoing management of CHA's digital materials so that they remain readable, meaningful, and understandable
- Clarify the roles and responsibilities for those engaged with ensuring the sustainability of the digital preservation program at CHA
- Recognize that digital preservation is a core function of the archive, and that preserving this material will require a significant amount of resources, organization, infrastructure, and planning across all levels of Carnegie Hall
- Develop and maintain in-house expertise for responsible stewardship of digital materials.
- Comply with the Open Archival Information System (OAIS) Reference Model standard and other digital preservation standards and practices as they evolve.
- Seek to conform to certification requirements for the Audit and Certification of Trustworthy Digital Repositories (TDR).

Mandatory Responsibilities

OAIS/TDR requirement

There are six mandatory responsibilities that an organization must discharge in order to operate an OAIS Archive. They are as follows.

The OAIS shall:

1. **Negotiate for and accept appropriate information from information Producers.**

Before Cortex is implemented throughout the organization, CHA must first establish some criteria to determine what constitutes "appropriate information", and should consider how to manage the process of negotiating for this information. These criteria may include, among others, subject matter, information source, degree of uniqueness or originality, and the nature of the techniques used to represent the information (e.g., physical media, digital media, format).

2. **Obtain sufficient control of the information provided to the level needed to ensure Long-Term Preservation.**

To be a responsible steward, CHA must (1) be fully aware of all legal and/or intellectual property restrictions that may impact an asset's use, and, (2) have the authority to modify an asset (e.g., migrating a videotape's content to digital). If CHA has created the assets being ingested into the DAMS and is its legal owner, then CHA already has the independence to do what is required to preserve the assets and make them available. However, if the assets being ingested were created by anyone else then CHA must ensure that there is a legally valid transfer agreement. This will either transfer the intellectual property rights of the asset to the CHA, or clearly specify the rights granted to the CHA in addition to any limitations imposed by the rightsholder(s).

3. **Determine which communities should become the Designated Community and, therefore, should be able to understand the information provided, thereby defining its Knowledge Base.**

As stated previously in this document, for CHA the Designated Community is broad and consists of both members of the Carnegie Hall staff and the general public.

4. **Ensure that the information to be preserved is Independently Understandable to the Designated Community.**

In particular, the Designated Community should be able to understand the information without needing special resources such as the assistance of the experts who produced the information. If CHA has any assets that may require additional context or information to be rendered independently understandable to the general public, then CHA must take responsibility for recording this contextual information and preserving it alongside the asset that it describes.

5. **Follow documented policies and procedures which ensure that the information is preserved against all reasonable contingencies, ensuring that it is never deleted unless allowed as part of an approved strategy.**

There should never be any ad-hoc deletion of assets, and CHA should implement policies and procedures to ensure that this rule is strictly followed.

6. **Make the preserved information available to the Designated Community and enable the information to be disseminated as copies of, or as traceable to, the asset as it was originally submitted, with evidence supporting its Authenticity.**

This will require CHA to have a Long Term technology usage plan in place, which should be updated as technology evolves. Additionally, CHA must develop a formal Succession Plan, contingency plans, and/or escrow arrangements in case the Carnegie Hall and/or CHA ceases to operate, loses its funding, or changes the scope of its mission. See 'Succession Planning' section below.

Challenges and Incentives

Like all digital preservation programs, the DAP faces challenges alongside incentives. These include:

Challenges

- **Technology** – Identifying and keeping pace with developments and changes in technology.
- **Costs** – Accounting for and addressing staffing, equipment, software, infrastructure, and other costs associated with the long-term stewardship of digital media.
- **Developing and sustaining a network of relationships** – A central component to the success of the DAP will be developing and maintaining a framework of communication that can adequately identify and address changing needs, practices, and values of DAP stakeholders, administrators, and users.
- **Maintaining a focus on preservation** – preservation planning must be an essential component of the DAP, and will require attention throughout the data management process.

Incentives

- **Improving CHA collections** – digital preservation is a process of active decision-making and intervention. Not everything can (or should) be preserved. Preservation planning will allow CHA to determine from the outset which digital materials should be preserved, and detail the steps necessary to steward these assets throughout their lifecycle.
- **Making digital preservation an economically sustainable activity** – the DAMS will help generate revenue (which may then be used in turn for future preservation initiatives) by streamlining the process of licensing archival material for publication and use.
- **Establishing an agreed upon outcome** – digital content often embodies a degree of structural complexity not found in physical materials, and having a set of well-defined and implemented preservation policies will set expectations for preservation outcomes for all kinds of digital media in Carnegie Hall’s care.
- **Sharing the responsibility of asset management** – the responsibility for preservation must be shared by the creators of digital media and by CHA staff alike. Having preservation policies in place coupled with a well maintained DAMS will allow CH staff to make considerations for the long-term persistence of digital materials from the moment an asset is created. This will measurably improve preservation outcomes as well as the richness of CHA’s collections.

Digital Preservation Policy

OAIS/TDR Requirement

The cornerstone of any sustainable digital preservation program is a high-level digital preservation policy framework. A digital preservation policy will: establish a set of pre-ingest conventions that staff must observe when creating digital files; provide a detailed ingest procedure that outlines how these files will be ingested into the repository once the archive becomes their steward; a methodology for preserving digital files; and a procedure that outlines how these files are to be retrieved for access.

The rules established within this document will affect or influence key creative choices and budget decisions made within production-oriented departments as well as I.T. Therefore, the creation of a digital preservation policy should ideally be a responsibility that is shared across these departments. The DAP Core Team should play an active role in shaping this document, and work to develop a process for approving the policy. This will entail creating a Digital Preservation Policy Committee, which should have at least one member from I.T., e-Strategy and/or WMI, and Creative Services. The Digital Preservation Policy Committee will be responsible for reviewing sample policies, discussing the current status of preservation at Carnegie Hall, assessing institutional commitment, soliciting feedback from various departments and/or archives users, and scheduling and implementing a periodic review of the resulting digital preservation policy.

This Digital Preservation and Sustainability document contains a clear set of guidelines about what the Digital Preservation Policy Committee should include in its policy, and the recommendations it contains are designed to be translated into action items that the Committee should address.

Recommendation: A Digital Preservation Policy Committee should be formed. This standing committee should be headed by a member of the Archives Department and should include at least one member from I.T., e-Strategy and/or WMI, and Creative Services.

Recommendation: Upon or prior to the Digital Preservation Policy Committee's formation, the committee should use this document to establish policy goals along with a timeline for achieving these.

Recommendation: After a digital preservation policy has been formally adopted, the Committee should schedule an annual meeting during which the digital preservation policy will be reviewed and updated, should there be a need to do so.

Policy Review

OAIS/TDR Requirement

Digital preservation has no end; by definition it is an ever-changing discipline that requires its practitioners to modify and adapt their preservation strategies in response to new technologies, problems, and solutions. For that reason alone, it is necessary for all digital preservation policies to be periodically reviewed, assessed, and revised. Furthermore, being able to show evidence that preservation policies are periodically reviewed is a requirement for any repository that is striving to be OAIS/TDR-compliant.

This Digital Preservation and Sustainability document will form the basis of CHA's digital preservation policies. Therefore, it is by definition a living document. Although the policies contained within this document should be revised during the year on an as-needed basis, CHA should establish a thorough annual review process during which all digital preservation and sustainability policies are assessed and updated. An appropriate time for this review to take place would be during the summer when workloads at Carnegie Hall tend to be lighter than during the Season. The responsibility for maintaining and reviewing these policies on an annual basis should be assigned within this document along with clear set of guidelines for review procedures.

Recommendation: CHA should establish a thorough annual review process during which all digital preservation and sustainability policies are assessed and updated.

Digital Content Review

OAIS/TDR Requirement

Effective preservation planning requires current, comprehensive, and cumulative information about digital content that an organization is currently managing. It will also take into account the digital content that an organization anticipates managing in the future. To complete a digital content review, the digital preservation team gathers information and iteratively accumulates as part of a structured process. This serves to create a snapshot of the collection's scope that is regularly updated to account for growth.

The results of ongoing digital content reviews produce a digital content review dataset that enables an archive to anticipate technological change and plan accordingly in both the near- and long-term.

There is an excellent set of examples, tools, and resources available to help with this task on the Digital Preservation Management Workshops website.¹ After a Digital Preservation Committee has been established plans should be made to conduct a comprehensive digital content review.

Recommendation: The Digital Preservation Committee should conduct a comprehensive digital content review using the Digital Preservation Management toolset as its guide.

Archives Policy Review

History

Carnegie Hall established its first archives in 1986. Since no formal repository existed prior to that time, the majority of Carnegie Hall's documented history had disappeared. What did remain was scattered throughout the building with no organization or protection. Original musical autographs and musician's photos signed "To Carnegie Hall" hung without security along highly trafficked corridors. The priority became to collect, acquire, house, and secure any material that would document Carnegie Hall's history: the theaters and events, the tenants, and building.

Memos were sent department-wide announcing the formalization of an archives and records management program with the directive that the paper trail for non-current administrative files ended in the archives. Appeals for Carnegie Hall-related material were made to collectors, musicians, and the public at large through the media and by advertising. Items soon began arriving from all over the world. One magazine article alone resulted in more than 15,000 pieces sent from all over the United States. Visits to flea markets, antique shows, and collectors became weekly routine.

A software program was purchased in 1988 to begin documenting every event in each of the three theaters. Random entries on a temporary basis led to an employee dedicated full-time to this task. To date more than 52,000 events have been catalogued. It has become the foundation of our collective events history and will become the cornerstone of our online digital access. The donation of one of Benny Goodman's clarinets by his daughters led to a \$1.5 million gift from the Susan and Elihu Rose Foundation to create the Rose Museum, which opened in April 1991, as part of Carnegie Hall's 100th anniversary celebration. The Rose Museum showcases items from the Carnegie Hall Archives in addition to presenting exhibitions of loaned materials.

In July 2012, the Carnegie Hall Archives embarked upon an exciting new chapter with the start of its Digital Archives Project, a multi-year initiative that will preserve and digitize

¹ <http://dpworkshop.org/workshops/management-tools/process-results>

most of the Hall's historic collections. Many of Carnegie Hall's archival materials—including photographs, program books, fliers, posters, correspondence, and recordings—are currently available only on paper or in media formats that are likely to become obsolete. This project will ensure that the Hall's legacy is preserved for future generations while also providing ways to capture new materials developed by Carnegie Hall in support of its artistic and educational programs.

Repository Mission Statement

Policy / OAIS/TDR Requirement

The Carnegie Hall Archives has a deep commitment to ensuring the safety, security and endurance of materials in its collections. The Archives' Mission is to acquire, preserve, and make publicly accessible documents—physical and digital—relating to the origins, history, activities, growth, and development of Carnegie Hall. This mission is accomplished by the conservation and preservation of objects in its care; by supporting research and scholarly use of the collections; and by presenting exhibitions within the Rose Museum.

Collections Policy

Policy / OAIS/TDR Requirement

In accordance with its mission, the Carnegie Hall Archives actively seeks to identify, acquire, preserve, and make available material that is of enduring informational value and historical significance to Carnegie Hall.

The Archives serves as the official and permanent repository of historical and inactive records of the Carnegie Hall Corporation. These records include, but are not limited to: correspondence, memos, minutes, financial records, contracts, reports, photographs, publications, programs, posters, audiovisual recordings, architectural drawings and subject files, as well as documents relating to administrative bodies previously associated with it, including Carnegie Hall Incorporated and the Music Hall Company of New York, Limited.

Access Policy

Policy / OAIS/TDR Requirement

The collections of the Carnegie Hall Archives are open for research by appointment to all members of the Carnegie Hall staff and to the general public. The collections do not circulate and all research must be done on-site under the supervision of the Archives staff. The Carnegie Hall Archives has an ethical obligation to ensure the preservation of these collections, to guarantee the privacy of donors, and to protect items of a legally sensitive or confidential nature, and in some cases sensitive materials are restricted.

If you would like to access Carnegie Hall Archives' collections or have questions about our holdings, please contact archives@carnegiehall.org.

Designated Community

Policy / OAIS/TDR Requirement

An Open Archival Information System (OAIS) is defined as an archive that has accepted the responsibility to preserve information and make it available to a Designated Community. The Designated Community is defined as an identified group of potential Consumers who should be able to understand a particular set of information. The determination of one or more Designated Communities is important for a preservation repository, because the repository must assure that archived digital information is independently understandable to that group.

For the Carnegie Hall Archives, the Designated Community is broad and consists of both members of the Carnegie Hall staff and the general public. It is the responsibility of the Carnegie Hall Archives to ensure that collections are presented to the Designated Community in understandable form. This may require the Archives to reformat objects, but it will not require extraordinary efforts, such as digital archeology or the acquisition of obsolete software or hardware.

Selections and Acquisitions

Policy / OAIS/TDR Requirement

Having a well-established, clearly defined selections and acquisitions policy is central to any sustainable preservation plan. Up to now there have not been wholly clear or consistent selections and acquisitions criteria for the Archives' collections. This has been due, in part, to the nature of the Archives' genesis; building a collection from scratch meant that Carnegie Hall was, at least in theory, interested in any item that a donor had to offer. However, given the changes that the Digital Archives Project will usher in surrounding the ease with which material can be uploaded to the DAMS, it is now more important than ever to have selections and acquisitions criteria firmly in place.

The suggested guidelines outlined below are intended to provide a solid foundation for a selections and acquisitions policy for the DAMS. These recommendations are the result of a series of interviews with stakeholders throughout the organization about their use of digital assets on a day-to-day basis, and—given the finite resources that are currently allocated for storing digital assets—are deliberately limited in their scope: they have been designed according to the precept that it will be easier to gradually widen a narrow policy than vice versa. Therefore, these guidelines should be reassessed regularly (particularly during the years directly following the DAP's launch) and expanded as appropriate.²

Going forward, it is recommended that CHA select and acquire the following categories of material are selected for long-term preservation:

² The decision to broaden existing selection and acquisition policies should not be taken prior to the allocation of all necessary funds for this expansion. This may require CHA to perform a detailed cost analysis of the additional infrastructure and storage that this will entail.

Webcasts, Telecasts, and Radio Broadcasts

CHA will acquire all audiovisual recordings of webcasts, telecasts, and radio recordings that take place in Carnegie Hall, regardless of their copyright status.

Having recordings of these events for both research purposes and as a reference for staff is essential. In the past, no staff member has been made explicitly responsible for requesting copies of the webcasts, telecasts, and radio broadcasts once they occur. This must change going forward. Because Hall Operations is responsible for most other aspects of these events when they take place, it is logical that they should assume responsibility for following up with the broadcasters after the event takes place to ensure that a recording of the event has been sent, received, and uploaded to the DAMS.

Recordings and Images of the Academy/Ensemble ACJW Performances

Currently all Academy/Ensemble ACJW Performances are recorded regardless of whether they take place on- or off-site. These recordings provide a useful reference for Academy/Ensemble ACJW fellows. Both current fellows and alumni may request a copy of these performances and photographs as a reference and/or for the purpose of research, provided that they sign a release for these recordings. Moreover, many of these events are educational, and may therefore provide a useful reference for future fellows, teachers, etc.

Final Versions of All e-Strategy and WMI-Produced Audiovisual Material

CHA should acquire the final (i.e., edited and approved) version of all audiovisual material produced by and/or for the Weill Music Institute. The material produced by WMI and e-Strategy is central to Carnegie Hall's mission, and has enduring value for educators, historians, and artists alike.

While the uncut interviews and raw footage filmed for these productions are historically valuable, educational, and has potential for re-use, the reality is that these files are extremely large; given the finite amount of storage currently available for Carnegie Hall's digital assets (as well as the large quantity of media produced by WMI and e-Strategy), raw/uncut assets should not be ingested into the DAMS at this time.

Selects of Professionally Photographed Events

When Carnegie Hall hires a photographer to take pictures at a concert or an event, he or she typically submits "selects" from the event within 24 hours. The photographer chooses these images, which can range in number between 3 and around 20, based on their quality as well as on how representative they are of the event itself. For this reason, it is recommended that CHA acquire the selects of all events that have been professionally photographed.

Slideshows of Professionally Photographed Events

After an event takes place and the photographer has delivered the images from it, someone from Development will review the full set of photos and select several shots for the slideshow. The slideshow typically contains photos of trustees, VIPS, celebs, etc. These

images are likely to be re-used in marketing material and/or by Development for future fundraising initiatives. Therefore CHA should acquire all the photographs contained within a slideshow.

Final Versions of High Priority Digital Assets Designed by Creative Services

It is difficult to precisely define what constitutes a “digital asset”. A broad definition of this term is “content that provides your organization with some recognized value.”³ Creative Services is responsible for creating upward of 1,600 digital assets per year. Many of these assets are low priority, meaning that they can be easily re-created and/or add little recognized value to Carnegie Hall. Some examples of assets that fit this description would be signage for the office and program inserts that are not germane to a particular performance. Low priority assets should not be ingested into the DAMS at this time.

Instead, CHA should ingest Creative Service’s high priority digital assets, which may include, for example, an annual report or a fundraising brochure announcing Carnegie Hall’s 125th anniversary. Determining what constitutes a high vs. low priority asset is an inherently qualitative task that will require Creative Services staff members to exercise their judgment. However, this will become easier over time as staff become accustomed to making this distinction, and as departmental needs are elucidated with regard to this material.

In the meantime, staff members should refer to the following set of criteria when categorizing an asset as low or high priority:

- How long will it take to recreate the asset?
- Does the asset add value to the organization?
- Who will need to access this asset again in the future?
- How often will this asset be accessed?

All Archival Study Recordings

The performances that take place inside the Hall may be either Carnegie Hall Presentations or a presentation by an outside licensee. Each season archival study recordings are made if the presenter requests and pays for a recording. Because they constitute an official record of the performances that take place at Carnegie Hall, CHA should select and acquire all archival study recordings for long-term preservation.

Recommendation: After a selection and acquisition policy has been established, it should be reassessed regularly (particularly during the years directly following the DAP’s launch) and expanded as appropriate.

Digital Assets Not Selected for Long-Term Preservation in DAMS

It is important that CHA, in collaboration with the I.T. and Digital Media departments, work to develop a longer-term ‘cold storage’ solution for all assets that have not been selected

³ <https://picturepark.com/digital-asset-management/what-is-digital-asset-management/>

for preservation within the DAMS. Currently these assets are stored on the M: shared network drive, which is backed up to AWS Glacier. There is likely a cheaper and more effective method for storing assets—particularly large assets like uncompressed video files—that staff may not need to access for years to come.

Also see ‘Develop Long-Term Preservation Strategy for Original Video Footage’ below in the Strategy Review section of this report.

Recommendation: CHA, I.T., and Digital Media should collaborate to investigate a cheaper and more effective method for longer-term storing of large video and audio assets that do not need to be accessed on a regular basis.

Digital Preservation Management Principles

OAIS/TDR requirement

For organizations that are committed to becoming trusted digital repositories, a formative step for developing a sustainable digital preservation program is to adapt and adopt a set of standards-based principles as a foundation. The principles provide a framework for your program.

These may include, for example:

- 1. Identify the digital content within our scope of responsibility**
The repository is producing a high-level inventory of its existing and anticipated digital content.
- 2. Specify the digital content we intend to preserve**
The repository will continually evaluate to prioritize the portion of its content to preserve.
- 3. Establish requirements for storing files in preservation formats**
The repository will identify preservation requirements specific to each digital content type.
- 4. Determine (and review) our best option(s) for storing our digital content**
The repository will actively maintain storage that is appropriate to its content and affordable.
- 5. Verify that our digital content is secure during day-to-day activities**
The repository will address the rights, confidentiality, and security requirements for its content.
- 6. Ensure that our digital content is prepared for an emergency**
The repository will extend its disaster planning program to explicitly include digital content.
- 7. Develop (and review) plans for managing digital content over time**
The repository will establish and sustain effective preservation planning for its digital content.
- 8. Define a standards-based framework to develop and manage our DCP program**

The repository will define and maintain a compliant curation and preservation framework.

9. **Demonstrate that long-term access is the purpose of digital preservation**
The repository will take steps to enable long-term access, as needed, to its digital collections.
10. **Stipulate that the means to deliver digital content to users will remain current**
The repository will leverage contemporaneous technologies to provide access to its content.⁴

Recommendation: after the Digital Preservation Policy Committee has been formed, establish an agreed upon set of digital preservation management principles.

Audit

OAIS/TDR requirement

In order to become a trusted digital repository an archive must demonstrate its ability to perform regular self-audits using tools like the Trusted Repository Audit and Checklist (TRAC).⁵ Self-assessment is an essential step because it helps an organization to achieve its objectives, including aligning with standards and demonstrating good practice. It will also provide an organization with the opportunity to leverage the results of the self-assessment to prioritize next steps for developing the digital preservation program.

Peer Review Audit

While performing routine self-audits is an important exercise for any archive, relying *only* on self-audits can cause certain details to be overlooked. Ideally an organization should be assessed by an outside party.

At present, the best option for Carnegie Hall would be to embark on a peer review audit process: This is a two year-long process that would require Carnegie Hall to partner with another institution that has a similar mandate and preservation agenda. During the first year, each institution would agree to go through the process of a complete, year-long TRAC self-audit independently.

After these are complete, Carnegie Hall would then perform a complete TRAC audit on the partner institution, and the partner institution would perform a TRAC audit on Carnegie Hall. After both the self-audit and the peer audit have been completed, comparing the two reports will highlight any gaps that should be addressed.

Recommendation: Partner with a similar organization and embark on two year-long peer review audit based on TRAC.

⁴ These guiding principles were adapted from the [Digital Preservation Outreach and Education \(DPOE\): Operating Principles \(ver. 2.0\)](http://www.dpworkshop.org/workshops/management-tools/principles/dp-principles-example) developed in 2011 by Nancy McGovern for the DPOE program sponsored by the Library of Congress. They can be found online at: <http://dpworkshop.org/workshops/management-tools/principles/dp-principles-example>

⁵ http://www.crl.edu/sites/default/files/d6/attachments/pages/trac_0.pdf

Disaster Preparedness

Policy / OAIS/TDR Requirement

Being able to demonstrate sufficient disaster preparedness is a fundamental requirement for becoming a trusted digital repository. CHA has established a robust disaster preparedness plan that is overseen, updated, and administered by a standing committee. The Archival Collections Preparedness Plan is designed to minimize the loss of or damage to CHA assets—both physical and digital—in the event of a disaster, whether small-scale or large.

Please refer to the Archival Collections Preparedness Plan for additional information.

Metadata and Documentation

OAIS/TDR Requirement

A key function of an OAIS-compliant repository is to develop preservation strategies and standards. Ensuring that the digital objects in CHA’s care will be findable, understandable, or usable throughout their lifecycles requires the consistent capture and maintenance of standards-based metadata. This includes information about the content, context, and structure of these objects. This metadata must be recorded and preserved alongside the objects themselves, which will require the implementation of both metadata and documentation policies (see “Documentation” section for additional information).

Metadata Schemas

As the volume of information born or stored digitally increases, concern also increases over the ability to ensure that records will continue to be accessible throughout their life cycle. To accomplish this end, information about the content, context, and structure of records must be recorded and managed. Many experts believe metadata is the key to meeting this challenge.

Selecting a metadata schema will require that CHA think about the goals for CHA’s collections in a real and practical way. Some questions to consider when selecting a metadata schema include:

- Who will be using the collection?
- Who is the collection cataloger?
- How much time/money do you have?
- How will your collection be accessed?
- How is your collection related to other collections?
- What is the scope of your collection?
- Will your metadata be harvested?
- Do you want your collection to work with other collections?
- How much maintenance and quality control do you wish?

Recommendation: Establish metadata policies and procedures for gathering, recording, and storing metadata over time, including technical, descriptive, administrative, and preservation metadata.

Recommendation: select and implement a metadata schema that will be used to record and maintain metadata according to CHA's metadata policies.

Documentation Standards

OAIS/TDR requirement

It is essential for a trusted digital repository to develop documentation standards. This is because it is a preservation requirement that the repository is able during the ingest process to ensure that information received from Producers conforms to the repository's documentation standards.

Documentation assures stakeholders that the repository is meeting its requirements and fully performing its role as a trustworthy digital repository. Archives engaging in high-level digital preservation must create documentation that reflects its Mission Statement and Strategic Plan and that captures preservation activities to ensure that repository policies and procedures are carried out in approved, consistent ways. This entails documenting all repository processes, decision-making, and goal setting.

Recommendation: Establish a documentation strategy that will bring CHA in line with the requirements for documentation practices established in the OAIS reference model.

File Naming Conventions

The consistency with which files are organized and named has a big impact on one's ability to find those files later and to understand what they contain. Historically, there has not been strict adherence to any set of naming conventions at Carnegie Hall; each department and/or member of staff at Carnegie Hall has been left to his own devices, and has consequently developed an individual system of file naming and organization suited to his/its particular needs. Although some departments have developed sophisticated methods of organizing their digital files, many members of staff have expressed frustration that they cannot easily locate the files that they need.

To help increase files' organization and discoverability, CHA should implement a systematized, organization-wide practice of file naming conventions based on the recommendations within this document. (Please refer to the *File Naming Best Practices & Guidelines* addendum for these guidelines). CHA should also conduct outreach to staff to raise awareness of these guidelines and explain why they should be used. The file naming conventions in this document will provide some guidelines designed to help Carnegie Hall staff name and organize files so that it is obvious where to locate and how to decipher the files on which their departments rely.

Recommendation: Adopt the *File Naming Best Practices & Guidelines* addendum in this document as policy.

Recommendation: Develop training/outreach tools to educate staff about the importance of establishing and adhering to file naming conventions.

Staffing

OAIS/TDR requirement

A Trusted Digital Repository must have the appropriate number of staff to support all functions and services. This is necessary in order to ensure repository staffing levels are adequate for preserving the digital content and providing a secure, quality repository. Comparing CHA's staff levels to the levels that are common throughout the industry demonstrates that CHA does not have the requisite level of staff that the scope of their digital preservation program demands.

Recommendation: In order to expand their digital preservation program CHA must hire an additional member of staff that will support the Digital Repository Manager.

Strategy Review

Policy / OAIS/TDR Requirement

CHA employs a number of strategies to ensure the long-term integrity of deposited materials. These include:

- Engagement in high-level preservation planning
- Reliance on standards for repository design and trustworthiness such as OAIS and TDR
- Use of standard content formats that meet community-accepted digital preservation standards, and that we are confident can be preserved and migrated forward to new preservation formats over time
 - CHA is committed to bit-level preservation and format migration of materials created according to these specifications as technology, standards, and best practices in the archives community evolve.
- Rigorous validation of content on ingest into DAMS
- Regular checks on the integrity of stored content through
 - Automated system checks that verify the integrity of digital objects with their ingested versions. These are performed on all files on an annual schedule
 - User access, and
 - Repository processes such as running scripts that automatically generate a list of all files contained within a drive in addition to their corresponding checksums and file paths.

Best Practice: Policies and Procedures

Establish Policies Governing the Compression of Born-Digital Video

The capacity to record high quality digital video has increased exponentially over the past decade, and digital video production routinely yields much larger files than any other born-digital works. Consequently, one of the primary concerns when preserving born-digital video is the substantial storage space that these files often require. Due to the extremely large file size of raw digital video footage, an unofficial practice has developed at Carnegie Hall whereby only the finished, compressed, web-ready version (typically an MP4) of a video file will be transferred to the V: drive (the shared network drive reserved for video) and ultimately put online; the project files, a higher resolution version of the finished film (typically a [lossy] H.264), and the original raw video footage remain indefinitely on an external hard drive.

This raises a concern regarding resolution: because these videos are only ever intended to be seen online (and therefore compressed), typically the final deliverables requested from production companies do not include an uncompressed version of the final (i.e., edited and approved) video file. Best practices for video preservation universally favor preserving a video file at the highest possible resolution;⁶ codecs that employ lossy data compression should not be used for preservation because they may compromise the integrity of the material during subsequent copying and regeneration.

Going forward, all departments that work with video production companies should revise their guidelines/contracts to include the delivery of an uncompressed mathematically lossless version of the final video file in addition to the lossy H.264 file that has traditionally been requested. Similarly, if digital video is being shot by an in-house crew, Carnegie Hall staff should ensure that the video is being captured uncompressed, and that an uncompressed version of the final, edited video file is being ingested into the DAMS.

Recommendation: CHA should work with digital asset producers to construct guidelines regarding the delivery of uncompressed mathematically lossless versions of all final video files.

Develop Long-Term Preservation Strategy for Original Video Footage

A perennial problem for staff relating to the above concern has been the fact that while the final version of most videos produced for Carnegie Hall are still accessible online (via either YouTube and/or Ektron, Content Management System), the original footage remains on the external hard drives on which it was delivered. This is, as mentioned above, due to both the extremely large file size of raw digital video footage and Carnegie Hall's limited storage capacity. But it is also due to the absence of both a central repository for digital assets and a firmly established policy outlining a preservation strategy for this original video footage.

⁶ The exceptions to this are cases, such as DV, where the digital video is born natively compressed. In these instances, best practices favor preserving the file using its native codec.

Now that CHA has begun the process of implementing the former, CHA must devote the time and resources to developing the latter.

The realities of file management storage costs will likely preclude the possibility of ingesting all original unedited video material into the DAMS. However, in most cases this footage is valuable, and has a high potential for re-use at a later date. In short, this footage is a valuable asset that should not be discarded, and yet its large size makes it a less-than-ideal candidate for ingestion into the DAMS as a matter of course. CHA should develop a preservation strategy and a long-term storage solution for material that fits into this category. Linear Tape-Open (LTO), an open-format tape storage technology, provides a cost-effective option for the long-term data management of these files. Regardless of the storage solution ultimately chosen, CHA should develop a clear set of policies governing the preservation of this material, and should begin to implement these procedures as soon as possible.

Also see ‘Digital Assets Not Selected for Long-Term Preservation in DAMS’ section above.

Recommendation: CHA, in collaboration with the Digital Preservation Policy Committee and the I.T. and Digital Media departments, should establish a cost-effective storage system for the long-term storage of assets—particularly large audiovisual files—that have not been selected for ingest in the DAMS.

Best Practice: Pre-Ingest

Determine Supported File Formats

OAIS/TDR Requirement

All archives, regardless of format, benefit from low variability in their holdings. Ideally all holdings would be uniform, but realistically this is not possible. Nevertheless, CHA should strive to reduce, to some degree, the range of file formats in its collection. This can be achieved by developing guidelines that include a list of acceptable file formats whose preservation CHA can support. Placing a limit on the number of supported file formats will diminish the need for format migration due to obsolescence of the encoding and wrapper.

The Sustainability of Digital Formats project at the Library of Congress is a helpful resource for this project.⁷

Recommendation: Using the Library of Congress’ Sustainability of Digital Formats tools as a guide, CHA, in collaboration with the Digital Preservation Policy Committee, should commit to investigating whether they should limit the variety of file formats within its collection.

⁷ <http://www.digitalpreservation.gov/formats/fdd/descriptions.shtml>

Preservation Action Plans

OAIS/TDR requirement

After CHA has made a determination about the file formats it will support, CHA should draft Preservation Action Plans for every kind of content in CHA's care. Media obsolescence and technological change are inevitable, and developing these plans is an essential part of the long-term management of digital material. Having a well-defined methodology for the preservation of each kind of material in CHA's collection is important because it will both promote the consistent management of these materials and allow for increased preparedness and organization when changes to the policy must be made.

Two good examples of policies that achieve this may be seen on the [Florida Digital Archive's website](#), which provides Action Plans on a format-by-format basis, and in the York University Library's [Digital Preservation Plan](#).

Recommendation: CHA, in collaboration with the Digital Preservation Policy Committee, should develop a Preservation Action Plan for every kind of content in its care.

Best Practice: Ingest

Removable Media Best Practices

All removable media has a limited shelf life. Currently the two most commonly used storage media within Carnegie Hall are hard drives and CD/DVDs, both of which have associated risks: Although estimates vary, commercially produced hard drives are not expected to function properly more than seven years after they were initially produced; the lifespan of optical media can vary dramatically even when manufactured at the same time, and the lack of optical drives in newer computers put both these storage formats at risk of becoming obsolete. If digital assets remain on removable storage media that become inaccessible due to either failure or obsolescence, it will be impossible to backup and audit this material. All best practices point to the ability to backup and geographically separate digital files as the single most basic criterion of digital preservation. Therefore, CHA should migrate any files stored on removable media to a more secure environment and ingest these files into the DAMS as soon as possible.

The more time that passes between an asset's creation and its ingest into a DAMS, the easier it becomes to lose critical metadata associated with the digital asset. In order to both mitigate this potential loss of information and to avoid creating a backlog, it is best practice to ingest material off removable media as soon as possible.

Rigorously Validate Content on Ingest

Policy / OAIS/TDR Requirement

Along with the ability to backup and geographically separate digital files, validating a file to ensure its fixity is a basic requirement of digital preservation. CHA ensures the fixity of its digitized legacy assets by running MD5 checksums on all digital assets that are ingested

into the DAMS. These are validated at least once annually by Cortex to ensure that the files do not become corrupt.

Best Practice: Long-Term Preservation Strategies

Sharing the Responsibility of Asset Management

OAIS/TDR Requirement

The responsibility for preservation must be shared by the creators of digital media and by CHA staff alike. In order for staff to become engaged in this task, CHA must educate all media creators about the roles that they will be expected to play in preserving Carnegie Hall's born-digital assets.

Having preservation policies in place coupled with a well maintained DAMS will allow CH staff to make considerations for the long-term persistence of digital materials from the moment an asset is created. This will measurably improve preservation outcomes as well as the richness of CHA's collections.

See also 'Rights and Metadata' section and 'Rights Metadata Best Practices and Guidelines' addendum below.

Recommendation: Develop and conduct outreach about the role that Carnegie Hall staff members will be expected to play in the preservation of born-digital assets.

Maintain Version Control

Version control is the management of changes to documents over time. Changes to the Digital Preservation and Sustainability policies will be inevitable, and it is important to record and track these changes behind the scenes as they are made. Doing so will promote transparency since it will enable all changes made to the policy to be visible both throughout and beyond the revision process. Furthermore, maintaining version control will provide a way to view the differences between the newest and older version of the Digital Preservation and Sustainability policies, thereby enabling a clear understanding of the genesis and evolution of current policies and practices.

There are different version control software applications that are available free of charge, but one that is currently being used with success for precisely this purpose is [Git](#),⁸ which is an open-sourced website hosted on [Github](#). CHA should host the public and canonical version of its Digital Preservation and Sustainability document on its website, and should use Git to maintain version control when these policies are updated.

⁸ York University Libraries currently uses Github to host Git version-controlled drafts of their digital preservation policy and all related documentation. It may be accessed here: https://github.com/yorkulibraries/preservation_documentation

Recommendation: In the spirit of the open information movement and also transparency, CHA should put its Digital Preservation and Sustainability policies up online and make it available for reference and/or re-use via Github.

Recommendation: CHA should keep track of and document all changes that are made to the Digital Preservation and Sustainability policies by using Git.

Copyright Information

OAIS/TDR Requirement

This may be accomplished by making the statement of rights information a requirement at the time of a file's ingest into Cortex. Not only will this enrich CHA's collections metadata, it will also provide a programmatic solution to the challenge of gaining intellectual control over copyright.

See also 'Rights and Metadata' section and 'Rights Metadata Best Practices and Guidelines' addendum below.

Preservation Strategy

Normalization

This is a strategy that entails adopting a particular set of preservation actions for all digital objects of a particular type (e.g., color images, structured text): upon ingest they are converted into a single chosen file format that is thought to embody the best overall compromise amongst characteristics such as functionality, longevity, and preservability.

Recommendation: CHA, in consultation with the Digital Preservation Policy Committee, should consider whether normalization should be a part of CHA's preservation strategy, and if so to what file types this policy should apply.

Migration

This is a preservation strategy that entails copying, or in some cases converting, data from one technology to another in order to preserve the essential characteristics of the data and to avoid obsolescence.

Recommendation: CHA, in consultation with the Digital Preservation Policy Committee, should consider how migration will fit into CHA's preservation strategy.

Preservation Implementation Plan

OAIS/TDR requirement

This is a written statement that has been authorized by the management of the repository that describes the services to be offered by the repository for preserving objects accessioned into the repository in accordance with the Preservation Policy. This often

contains the framework or context for carrying out established goals and priorities in a logical, efficient, and effective manner, and is a working tool for achieving agreed-upon priorities over a set period of time. Having a Preservation Implementation Plan in is OAIIS/TDR requirement, and CHA should work with the Digital Preservation Policy Committee to develop one.

Recommendation: CHA, in consultation with the Digital Preservation Policy Committee, should develop a Preservation Implementation Plan.

Preservation Planning

Strategic Plan

OAIIS/TDR requirement

This is a written statement that has been authorized by the management of the repository that states the goals and objectives for achieving that part of the mission of the repository concerned with preservation. Preservation Strategic Plans may include long-term and short-term plans. Having a Preservation Implementation Plan in is OAIIS/TDR requirement, and CHA should work with the Digital Preservation Policy Committee to develop one.

Recommendation: CHA, in consultation with the Digital Preservation Policy Committee, should develop a Strategic Plan.

Rights Metadata and Management

OAIIS/TDR requirement

Rights metadata is not just about compliance with intellectual property laws; it is impossible to responsibly steward digital assets without the relevant rights information. It is for this reason that obtaining sufficient control of digital assets is one of the Mandatory Responsibilities for preserving information in the long-term.

Copyright issues affect nearly every single department within Carnegie Hall. However, currently there is no unified system for recording and tracking rights-related information pertaining to born-digital. As a result, every department has developed its own system to cope with and manage the rights issues that it faces.

One common approach has been to address rights issues by inserting rights clauses into the contracts or releases signed by performers and participants. However, these documents are stored separately from the resulting media, which ultimately disassociates the rights information from the media on which it is stored.

Even in cases where the rights status of a particular asset may be known at the time of its creation, that information is not typically recorded. The presumption tends to be that the asset's rights information can always be looked up after the fact if necessary. However, while this practice may save time in the short-term, the long-term consequences of failing

to record this information are significant. In both cases the inevitable result is the gradual loss of this information.

These facts notwithstanding, Carnegie Hall generally has a high level of awareness about rights issues, and due to the caution Carnegie Hall exercises in this arena, historically no major rights-related incidents or disputes have arisen.

Nevertheless, as a best practice Carnegie Hall should develop and implement stringent institution-wise guidelines that establish the capture of copyright information for all born-digital objects. This should be made a routine, organization-wide practice activity with structured data rules and an established work flow. Ideally rights information should be embedded within the digital object itself prior to the launch of Cortex. When the DAMS is fully implemented, this policy can be programmatically enforced by making the inclusion of rights information a mandatory field upon ingest of any digital file, whether it is a digitized legacy asset or a born-digital object. Please refer to the Rights Metadata Best Practices & Guidelines addendum for guidance.

Recommendation: establish a routine, organization-wide practice of recording copyright information upon the creation of a digital asset based on the “Rights Metadata Best Practices & Guidelines” addendum in this document.

Recommendation: rights information should be embedded within the digital object itself to ensure that it does not become separated.

Recommendation: educate all Carnegie Hall staff that create digital assets about the importance of rights metadata, and provide training for staff members about how to record/embed this information.

Recommendation: programmatically enforce the gathering and recording of rights information via Cortex by making the inclusion this metadata a requirement upon ingest into the DAMS.

Roles and Responsibilities

Security Management

Building Security

Policy

There are several building security measures in place at Carnegie Hall to protect its digital infrastructure.

Security at Carnegie Hall is tightly regulated, . Only Building Engineers, Archives and IT staff have access to the locations in which CHA collections are stored. Access is controlled via card-key and is logged in the building-wide Siemens access control system.

Additionally, both the data center and the Archives' on-site storage are equipped with security cameras.

Cybersecurity

Policy

Cybersecurity refers to computer and network security. Carnegie Hall has robust security measures in place to protect its digital assets, including but not limited to the following:

- All firewalls are configured to block all traffic by default, with only limited and key traffic allowed through.
- Firewall administrative access is highly restricted, and all changes are logged.
- Unused data jacks throughout the building are disabled by default.
- All data closets are physically locked, restricted, and access is logged.
- Wireless networks are not connected in any way to the Carnegie Hall administrative network, with the sole and highly restricted exception of the ticket scanning network.
- All web-browsing on the administrative network is routed through a proxy server as well as an HP TippingPoint web browsing firewall.
- Datapipe provides Intrusion Detection Services (IDS), Nexpose vulnerability scanning with reports, and DDOS protections.
- External access to any resources on the Carnegie Hall administrative network can only be accomplished via VPN, with the exception of web-based email access, which is encrypted over https with an SSL certificate from GeoTrust.
- GeoTrust certificates also protect our VPN, Tessitura API, and web site.

Storage, Duplication, and Backup

Policy / OAIS/TDR Requirement

CHA is committed to ensuring that all digital assets in its care are stored, duplicated, and rigorously backed up, with copies of all assets in CHA's care being stored in geographically disparate locations.

In adherence with archival and I.T. systems storage best practices, multiple copies of the Cortex DAMS application and assets will be stored in geographically separate locations with full synchronization of all content on a 15-minute schedule. This full synchronization will include the entire DAMS application, including databases, code, indexes and assets. Each copy will be configured to serve as the live (or primary) system in case either is unavailable for any reason. The primary asset storage will be located at Carnegie Hall's Data Center at its administrative offices in New York City on EMC Isilon arrays in fully redundant configuration. The synchronized storage location will be at Datapipe, which is located in Somerset, NJ.

A third, non-mirrored incremental back up copy of the entire DAMS system will be stored in a low-tier storage environment such as Amazon Glacier, to be used only in disaster recovery scenarios where both the primary and secondary copy have been lost, or if there is a need to recover data from a particular moment in time. This data cannot be deleted.

All digital assets that are not ingested into the DAMS will be stored on shared network drives at Carnegie Hall. Network drives are backed up to Amazon Glacier.

Sustainability Planning

Trust Frameworks

Background

A trust framework is a digital preservation planning tool that clearly defines the characteristics and responsibilities of a sustainable digital repository. Trust frameworks typically lay out the organizational and technical infrastructure required for an institution to be considered trustworthy and capable of storing digital information over the long-term. Simply put, a trust framework provides organizations with a way to measure—and thereby demonstrate to potential donors, clients, or auditors—its trustworthiness as a steward of digital information.

Some trust frameworks, like the [Global LOCKSS Network](#), [Meta Archive](#), [Data Preservation Alliance for the Social Sciences \(Data-PASS\)](#), and the [Digital Preservation Network \(DPN\)](#), work on the principle of redundancy and broad-based collaborative institutional mechanisms as a strategy for mitigating single-points-of-failure within a given institution. In this system, multiple organizations that may not be able to individually provide all the elements necessary for a sustainable, end-to-end digital repository enter into an agreement to become collaborative stewards of digital information.

Other trust frameworks, like the [NESTOR Catalogue of Criteria for Trusted Digital Repositories](#), [DRAMBORA](#), and the [Trustworthy Repositories Audit & Certification \(TRAC\)](#) criteria, take the form of auditing tools. These trust frameworks are intended to allow organizations to determine their capability, reliability, commitment, and readiness to assume long-term preservation responsibilities. While some of these tools offer organizations the possibility of performing a self-audit, others offer repositories the possibility of being evaluated and ultimately certified as a trustworthy digital repository by an outside auditor.

Perhaps the most relevant trust framework is the Audit and Certification of Trustworthy Digital Repositories ([ISO 16363:2012](#), or just “TDR” for short). Intended for use in combination with the OAIS Reference Model ([ISO 14721:2003](#)), TDR lays out the organizational and technical infrastructure that an institution must have in order to be considered trustworthy and capable of ensuring the stewardship of digital objects over the long-term by outlining 109 distinct criteria designed to measure a repository’s trustworthiness as a steward of digital information.

Importance of Trust Frameworks

Trust frameworks matter when it comes to sustainable digital preservation because in order to provide reliable, long-term access to managed digital resources, archives must assume high-level responsibility for this material. This requires a significant amount of resources, organization, infrastructure, and planning across all levels of an organization. Attempting to steward digital material over the long-term on an ad-hoc basis or without the appropriate resources and infrastructure in place is dangerous, and will ultimately put the material they are tasked with caring for at risk. In order to do this effectively, archives must have some metric by which they can evaluate their progress. Trust frameworks provide this.

Additionally, trust frameworks are designed to take into account a number of criteria beyond merely an organization's digital preservation infrastructure. These include, for example, the degree of fiscal responsibility an institution is able to demonstrate, and whether or not the institution of an appropriate succession plan, contingency plans, and/or escrow arrangements in place in case the repository ceases to operate. In spite of the fact that both of these criteria are critical to an organization's ability to provide long-term access to digital resources, they might be easily overlooked. Being evaluated according to set of established standards—whether vis-à-vis a self-audit or by an external auditor—can highlight holes in a repository's operation that may not be apparent in the course of normal, day-to-day business.

Finally, as TDR states in its introduction, "Claims of trustworthiness are easy to make but are thus far difficult to justify or objectively prove." On a very basic level, trust frameworks provide institutions with a metric that allows them to compare their own systems and procedures against an established, high profile standard in order to evaluate their trustworthiness. Employing a trust framework will allow archives to provide evidence to potential grantmaking bodies, donors, or board members that they are responsible and trustworthy digital stewards committed to practicing sustainable digital preservation.

Barriers and Roadblocks

While the importance of trust frameworks is undeniable from a theoretical standpoint, the reality of implementing a trust framework can be much more complex. One significant roadblock is the high cost. For example, undergoing a formal audit process in order to become officially certified as a Trusted Digital Repository can cost tens of thousands of dollars.⁹ This is cost-prohibitive and unnecessary for most organizations, Carnegie Hall included.

Recommendation: Incorporate trust frameworks where appropriate into CHA's high-level preservation plan.

⁹ It is also worth noting that this certification expires and organizations must be re-certified every 3 years.

Succession Planning

Devise an Exit Strategy

OAIS/TDR requirement

One of TDR's essential criteria for sustainable preservation is that the repository in question has an appropriate, formalized succession plan, contingency plan, and/or escrow arrangements in place. Taking the time to make provisions for these events is crucial because should the repository cease to operate, experience crippling budget cuts, or should the scope of its mission change, its collections would become endangered. Having arrangements in place with another organization—for instance, the Library of Congress, or the New York Public Library—to assume custody of CHA's collections is essential in order to protect them from loss and neglect should any of these unfortunate circumstances be met. Therefore, CHA should devise an exit strategy for their collections whereby their care is guaranteed in the long-term. This will likely require seeking out a partnership with another institution that will agree to assume high-level responsibility for CHA's collections if CHA is no longer able to guarantee their stewardship.

Recommendation: Seek out a partnership with an appropriate cultural heritage organization that can assume high-level responsibility for CHA's digital assets and guarantee their stewardship should CHA be unable to care for these assets in the future.

Summary of Recommendations

Overall the digital preservation effort at CHA is good. The digital assets in its care are stable, and crucially, the staff understands the preservation challenges facing their collection and is aware of the areas in their preservation policies that could be improved. Implementing the recommendations made throughout this report will substantially strength CHA's digital archiving program by bringing CHA closer in line with standards like OAIS and TDR.

They are as follows:

Short Term

These recommendations can all be accomplished without any additional funding or staffing. Implementing these suggestions will aid CHA's digital preservation efforts and will have an immediate impact on the collections.

- **Formation of a Digital Preservation Policy Committee**—This standing committee should be headed by a member of the Archives Department and should include at least one member from I.T., e-Strategy and/or WMI, and Creative Services.
- **Make Goals and a Timeline for Establishment of a Digital Preservation Policy**—Upon or prior to the Digital Preservation Policy Committee's formation, the

committee should use this document to establish policy goals along with a timeline for achieving these.

- **Establish Regular Meeting Schedule**—At the Digital Preservation Policy Committee’s first meeting, the Committee should agree upon and schedule an annual meeting during which the digital preservation policy will be reviewed and updated, should there be a need to do so.
- **Establish Annual Review of Digital Preservation Policies**—The Digital Preservation Policy Committee should establish a thorough annual review process during which all digital preservation and sustainability policies (including selection and acquisition policies) are re-assessed and updated, if necessary.
- **Agree upon Digital Preservation Management Principles**—after the Digital Preservation Policy Committee has been formed, establish an agreed upon set of digital preservation management principles that will be a guide for all future digital preservation initiatives.
- **Establish Policies to Govern Resolution of Preservation Masters**—CHA and the Digital Preservation Policy Committee should work with digital asset producers at Carnegie Hall to construct guidelines regarding the delivery of uncompressed mathematically lossless versions of all final video files.
- **Make Digital Preservation and Sustainability Policy Available Online**—In the spirit of the open information movement and also transparency, CHA should put its Digital Preservation and Sustainability policies up online and make it available for reference and/or re-use via Github.
- **Maintain Version Control**—CHA should keep track of and document all changes that are made to the Digital Preservation and Sustainability policies by using Git.
- **Design Preservation Strategy**—CHA and the Digital Preservation Policy Committee should work with digital asset producers at Carnegie Hall to establish a preservation strategy for all born-digital material being preserved via the DAMS. These ingest workflows should take into consideration strategies like normalization and migration, and should be expressed in comprehensive Preservation Implementation and Preservation Strategic Plans.

Medium-Term

Although these recommendations can all be accomplished without any additional funding or staffing, they will take a longer period of time—perhaps several years—to achieve.

- **Conduct a Thorough Digital Content Review**—The Digital Preservation Committee should conduct a comprehensive digital content review using the Digital

Preservation Management toolset as its guide.

- **Perform a Peer Audit**—Partner with a similar organization and embark on two year-long peer review audit based on the Trusted Repository Audit and Checklist tool. This will allow CHA to assess its own trustworthiness as a digital repository without the burdensome cost that can be associated with this task.
- **Establish Metadata Policies**—The Digital Preservation Policy Committee should establish more stable procedures for gathering, recording, and storing metadata over time, including technical, descriptive, administrative, and preservation metadata.
- **Select and Implement a Metadata Schema**—After the Digital Preservation Policy Committee has established metadata policies, the Committee should select and implement a well-documented metadata schema that will be used to record and maintain metadata over time.
- **Establish a Documentation Strategy**—The Digital Preservation Policy Committee should work toward establishing a documentation strategy that will bring CHA in line with the requirements for documentation practices established in the OAIS reference model.
- **Implement File Naming Conventions**—CHA and the Digital Preservation Policy Committee should implement the File Naming Conventions and Best Practices addendum in this document as policy on an institution-wide level. An important step in this process will be to develop training/outreach tools that CHA can use to educate staff about the importance of establishing and adhering to file naming conventions.
- **Determine Supported File Formats**—Using the Library of Congress’ Sustainability of Digital Formats tools as a guide, CHA, in collaboration with the Digital Preservation Policy Committee, should commit to investigating whether they should limit the variety of file formats within its collection. This will entail performing a cost-benefit analysis of the effort it would take to preserve the proprietary software required to playback all the various file formats in CHA’s care, such as PhotoShop and InDesign.
- **Develop Preservation Action Plans**—After a Digital Content Review has been conducted CHA should develop a Preservation Action Plan for every kind of content in its care.
- **Develop Requirements for Creation of Rights Metadata**—CHA, in collaboration with the Digital Preservation Policy Committee, should work with digital content producers to develop rules about the creation of rights-related metadata (i.e., embedding rights information upon an asset’s creation into the asset itself). Once

these rules have been agreed upon, CHA should develop outreach and training materials for all Carnegie Hall staff involved in the creation of digital assets so that they understand the role that they will be expected to play in the preservation of born-digital assets.

Long-Term

These recommendations cannot be achieved without additional (and in some cases, significant) funding and staffing. Implementing these suggestions will have a long-lasting effect on the condition of the collection, and will bring CHA significantly closer to being OAIS/TDR-compliant.

- **Invest in Alternative Long-Term Storage Solution**—CHA, I.T., and the Digital Media departments, in collaboration with The Digital Preservation Committee, should invest in a cheaper and more effective method for longer-term storing of large video and audio assets that do not need to be accessed on a regular basis.
- **Hire Additional Staff**—CHA should hire additional staff with a background in digital preservation to support the Digital Repository Manager.
- **Incorporate a Trust Framework into CHA's Preservation Strategy**—Trust frameworks can provide a wonderful opportunity to strengthen an existing preservation plan. After a preservation strategy has been established, CHA should investigate whether there is an appropriate trust framework that could be incorporated.
- **Devise an Exit Strategy**—Eventually CHA should seek out a partnership with an appropriate cultural heritage organization that can assume high-level responsibility for CHA's digital assets and guarantee their stewardship should CHA be unable to care for these assets in the future.

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Addenda

File Naming Best Practices & Guidelines

How you organize and name your files will have a big impact on your ability to find those files later and to understand what they contain. The file naming conventions in this document will provide some guidelines designed to help Carnegie Hall staff name and organize files so that it is obvious where to find specific data and what the files contain. Carnegie Hall staff should adhere to the following file naming conventions to consistently name documents, spreadsheets, photographs, audio, video, print media, and all other types of digital files. Using consistent file naming conventions will save Carnegie Hall staff time and also help facilitate digital archiving and cross-platform compatibility.

Based on international standards (ISO 9660:1999) and digital asset management best practices, here are a few basic rules to keep in mind:

1. File names should be ***unique, human readable*** and ***descriptive***. Your file names should make it obvious where to find specific data and what the files contain. A descriptive filename is made up of actual words, abbreviations or numbers that bear some relation to the content, name or accession number of the asset itself. Think of a future Carnegie Hall staff member trying to locate and discern the content of your digital files based on the file name alone.
2. File names should be ***specific, brief,*** and ***consistent***. File names that are too general (e.g., contract.doc) will make it difficult to discern its content, as will file names that are too long (in general, more than 32 characters is too long)¹⁰. Consistent naming structures are crucial to file identification.
3. File names should contain ***no spaces***. Some programming languages use spaces to signify the end of a character string, and many software applications don't recognize file names that contain spaces. On the web, spaces are typically replaced with "%20" in URLs, and some browsers will 'throw away' anything after a space. Use the underscore symbol (_) or dash (-) in between words to

¹⁰ It is important to keep in mind that the Windows operating system puts a limit of 260 characters for any file's complete name (i.e., its file path, which includes the names of any folders and sub-folders that contain the file).

represent a space, or use CamelCase¹¹ and omit spaces from your file names altogether.

4. File names should only contain letters, numbers, underscores, or dashes. **Do not use special characters** such as * . " / \ [] : ; | = , < ? > & \$ # ! ' { } () Special characters are often reserved for functions in scripting and programming languages, and using these characters in file names can cause problems.

5. Dates should be expressed using ISO standard 8601:2004, which states that **dates should be expressed as YYYYMMDD**. Expressing the date in this format is important because 1) this will sort files in chronological order for files that have the same prefix or suffix, and 2) the date stored with a file on your computer may be changed if the file is moved to another computer. Having a date as part of the file name prevents confusion and misinformation surrounding a file's creation.

Example: 19560415_ISA_Trotta_ArchStudyRec.mp3

6. Only use abbreviations if they are common knowledge and staff in other departments will easily understand the abbreviation. The following are examples of abbreviations common to Carnegie Hall administrative staff:
 - CHC = Carnegie Hall Corporation
 - WMI = Weill Music Institute
 - ACJW = The Academy
 - NYO = National Youth Orchestra
 - ISA = Isaac Stern Auditorium
 - ZH = Zankel Hall
 - WRH = Weill Recital Hall

7. Please refer to the latest Carnegie Hall Taxonomy document for proper usage of commonly used terms for venue and content type.

8. Include the edit or version number (if applicable). This rule is especially important for audiovisual projects.

¹¹ CamelCase is a naming convention in which a name is formed of multiple words that are joined together as a single word with the first letter of each of the multiple words capitalized so that each word that makes up the name can easily be read

9. It is often necessary to produce multiple variants of a single file, such as a black & white or CMYK version of a particular image, or a web version of a video clip. Being able to distinguish these files from one another at a glance will not only save staff time in the near-term, but will also make it easier for the correct version of a file to be identified and retrieved by a different member of staff in the future. Carnegie Hall staff should add a suffix to each file name that identifies it as a variant and indicates which version of the file it is.

Example: MKT_20140915_CHCBrochure14-15_CMYK.tif

10. Apply file naming guidelines to all folders and sub-folders in the file’s hierarchy. Since these folder names will become part of the file path, it is important to consistently and meaningfully name all folders and sub-folders that contain a given file. Carnegie Hall staff should develop folder and sub-folder naming conventions that relate the electronic records that they house to an item in a file plan.

For instance, folders are often named for the major functions or activities to which the records relate. Sub-folders are frequently named by year or month. Folder names should be easy to interpret and unique and should contain no more than eight levels.

11. If you have questions about naming digital files, please contact Archives (archives@carnegiehall.org)

Text, Data, and Spreadsheet Files

These files include Microsoft Word documents, Excel spreadsheets, CSV files, PowerPoint files, and other text files. Includes page layout files such as PDF (for textual information).

- Commons file extensions are .doc, .txt, .rtf, .pdf, .xls, .ppt, .csv

Use the following components for the file name. An underscore or a dash should separate each component except for the file format extension at the end.

File name component	Description and example	Requirement
Performance Date	Date using standard format <i>YYYYMMDD</i> If not related to a performance, creation date of the file can be used. <i>e.g., 20140624</i>	Required

Performance Venue / Location	Indicate the CHC venue by using the following hall abbreviations: <ul style="list-style-type: none"> ▪ Isaac Stern Auditorium = ISA ▪ Zankel Hall = ZH ▪ Weill Recital Hall = WRH ▪ *For general CH business that has nothing to do with performances, use the prefix 'CHC' followed by the date that the document was created. 	Required, if applicable
Rental Client/CHC Performer	Name of rental client or name of performer For names, use LastNameFirstName format. Do not use spaces in between names. <i>e.g., CostelloElvis, or ViennaPhilharmonic</i>	Required, if applicable
Content Type	Use taxonomy content type list to briefly describe the content type. If it is not included in the taxonomy content type list, please let Archives know and they will add it. <i>e.g., agreement or stageplot</i>	Required
Version Number	If the document is a revised/edited version of a previous document, indicate the version number. <i>e.g., v01, v02, v03</i>	Required, if applicable
File format extension	<i>e.g., .doc, or .pdf</i>	Required

EXAMPLES: *20140624_ISA_CostelloElvis_agreement_v03.pdf*
 20140226_ISA_ViennaPhilharmonic_stageplot.doc
 20140624_ISA_CostelloElvis_SalesReport.xls

Photograph Files

For photograph files including JPEG, TIFF, PNG, and PDF file formats, use the following components for the file name. An underscore or a dash should separate each component except for the file format extension at the end.

File name component	Description and example	Requirement
Performance Venue	Indicate the CHC venue by using the following hall abbreviations: <ul style="list-style-type: none"> ▪ Isaac Stern Auditorium = ISA 	Required, if applicable

	<ul style="list-style-type: none"> ▪ Zankel Hall = ZH ▪ Weill Recital Hall = WRH 	
Performance Date	<p>Date using standard format <i>YYYYMMDD</i></p> <p>If not related to a performance, creation date of the file can be used.</p> <p><i>e.g., 20140624</i></p>	Required
Rental Client/CHC Performer	<p>Name of rental client or name of performer</p> <p>For names, use LastNameFirstName format. Do not use spaces in between names.</p> <p><i>e.g., CostelloElvis, or ViennaPhilharmonic</i></p>	Required, if applicable
Unique Number from the Camera	<p>Use the unique number of the image generated from the camera.</p>	Required, if applicable. If not applicable, see next component
Description	<p>Only use this component if there is no unique number reference from the camera. A brief description should be less than 10-15 characters.</p>	Required, if no unique number from the camera
File format extension	<i>e.g., .tif or .jpg</i>	Required

EXAMPLES:

- a contracted photographer’s photo from Elvis Costello’s performance:
20140624_ISA_CostelloElvis_0499.jpg
- a photo of flowers on stage on opening night, taken by a staff person’s cell phone (no unique number generated from camera):
- *20131002_ISA_PhiladelphiaOrch_flowers.tif*
(If there are two or more pictures of flowers, make sure the description is unique):
20131002_ISA_PhiladelphiaOrch_flowers2.tif,
20131002_ISA_PhiladelphiaOrch_flowers3.tif

Print Media Files

Creating files for print media often requires multiple variants of a single file to be made. These can include black and white versions, web versions, CMYK versions, etc. Being able to distinguish these files from one another at a glance will not only save staff time in the near-term, but will also make it easier for the correct version of a file to be identified and retrieved by a different member of staff in the future.

For print media files, including .jpg, .tif, .pdf, .png, and .psd Carnegie Hall staff should add a suffix to each file name that identifies it as a variant and indicates which version of the file it is.

The American Society of Media Photographers recommends the following suffices:



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File name component	Description and example	Requirement
Department or Client	<p>Indicate for which department or client the file has been created.</p> <p>Indicate the CHC Department by using the following hall abbreviations:</p> <ul style="list-style-type: none"> ▪ Artistic Programming = AP ▪ WMI = WMI ▪ eStrategy = ESTR ▪ Marketing = MKT ▪ Archives = CHA ▪ Hall Ops = HO ▪ Box Office = BO ▪ Office Services = OS ▪ Public Relations = PR 	Required, if applicable
Performance Venue	<p>Indicate the CHC venue in which the event is taking place by using the following hall abbreviations:</p> <ul style="list-style-type: none"> ▪ Isaac Stern Auditorium = ISA ▪ Zankel Hall = ZH ▪ Weill Recital Hall = WRH ▪ *For general CH business that has nothing to do with performances, use the prefix 'CHC' followed by the date that the document was created. 	Desired, if applicable
Rental Client/CHC Performer	<p>Name of rental client or name of performer For names, use LastNameFirstName format. Do not use spaces in between names.</p> <p><i>e.g., CostelloElvis, or ViennaPhilharmonic</i></p>	Required, if applicable

Event	A brief event description should be less than 10-15 characters. e.g., MusicalExplorers, or EnsembleACJWPerf	Required, if no Rental Client/CHC Performer is listed
Performance or Event Date	Date using standard format <i>YYYYMMDD</i> If not related to a performance, creation date of the file can be used. <i>e.g., 20140624</i>	Required, if applicable
Description	A brief description of the file should be less than 10-15 characters. <i>e.g., playbill, or brochure</i>	Required
Variant	Add a suffix to each file name that identifies it as a variant and indicates which version of the file it is. e.g., m (for 'Master'), fm (for 'Flattened Master'), cmyk, and print (for desktop print-ready versions)	Required, if applicable
File format extension	<i>e.g., .tif or .jpg</i>	Required

EXAMPLES:

- a playbill for Elvis Costello's performance:
AP_ISA_20140624_CostelloElvis_Playbill_CMYK.psd
- a desktop print-ready brochure for an Ensemble ACJW performance at Zankel Hall:
Academy_ZH_20150309_EnsembleSCJW_Brochure_Print.pdf
- an ad for Bank of America to be printed in marketing material pertaining to season announcement:
MKT_SeasonAnnounce_BofA_Ad_20150319_fm.tif

Audio Files

Audiovisual projects often involve a wide range of deliverables, including the high-resolution and/or uncompressed Master, low-resolution web-ready proxies, trailers, raw footage, and rough cuts. It is important to adhere to a file naming convention that distinguishes original files from derivatives. Carnegie Hall staff members should plan for this and incorporate enough headroom into the file name to add a descriptor that identifies a file's generation.

For audio files, it may also be helpful to include the sample rate and bit depth of an audio file in the file name itself so that it is possible to distinguish between several versions of the same file at a glance.

File name component	Description and example	Requirement
Performance Date	Date using standard format <i>YYYYMMDD</i> If not related to a performance, creation date of the file can be used. <i>e.g., 20140624</i>	Required
Performance Venue	Indicate the CHC venue by using the following hall abbreviations: <ul style="list-style-type: none"> ▪ Isaac Stern Auditorium = ISA ▪ Zankel Hall = ZH ▪ Weill Recital Hall = WRH ▪ *For general CH business that has nothing to do with performances, use the prefix 'CHC' followed by the date that the document was created. 	Required, if applicable
Rental Client/CHC Performer	Name of rental client or name of performer For names, use LastNameFirstName format. Do not use spaces in between names. <i>e.g., CostelloElvis, or ViennaPhilharmonic</i>	Required, if applicable
Unique Number from the Recording Device	Use the unique number of the audio file generated from the recording device. <u>DO NOT CHANGE OR RENAME THESE UNIQUE NUMBERS</u>	Required, if applicable
Technical Specifications	Staff may want to add the bit rate and sample depth of a particular track, if known. <i>e.g., 96k_24b, or 48k_16b</i>	Desired, if specs are known
Description	Only use this component if there is no unique number reference from the recording device. A brief description should be less than 10-15 characters.	Required if no unique number from the recording device
Version Number	If the audio file is a revised/edited version of an original audio file, indicate the version number. <i>e.g., v01, v02, v03</i>	Required, if applicable

Part Number and/or Channel	Use to indicate multiple parts of a single recording e.g., <i>20140624_CostelloElvis_Part01_ed01</i> , or <i>20140624_CostelloElvis_ch1</i>	Required, if applicable
Generation	Use to indicate the generation of video footage e.g., or (for Original), pm (for Preservation Master), mz (for Mezzanine), ac (for Access)	Required
File format extension	e.g., <i>.tif</i> or <i>.jpg</i>	Required

EXAMPLES:

- an archival study recording of Elvis Costello’s performance:
20140624_ISA_CostelloElvis_96k_24b_ch01_or.mp3
- a recording of a WMI Neighborhood Concert:
20150325_CyroBaptista_NeighborConc_Part01_48k_16b_ac.mp3

Video Files

Some digital video cameras output a number of files in addition to a video clip that are all packaged together in a directory structure. Quite often, these additional files, their file names, and the directory structure itself all play an important role in functionality of the video file.

Therefore, for camera-generated digital files or Source Clips: **DO NOT CHANGE OR RENAME THE ORIGINAL FILES.** Instead of changing the original file name, create a folder using the below file naming conventions below and add the original video files to the new folder.

File name component	Description and example	Requirement
Performance Date	Date using standard format <i>YYYYMMDD</i> (If not related to a performance, creation date of the file can be used.) e.g., <i>20140624</i>	Required
Performance Venue	Indicate the CHC venue by using the following hall abbreviations: <ul style="list-style-type: none"> ▪ Isaac Stern Auditorium = ISA 	Required, if applicable

	<ul style="list-style-type: none"> ▪ Zankel Hall = ZH ▪ Weill Recital Hall = WRH 	
Rental Client/CHC Performer	<p>Name of rental client or name of performer For names, use LastNameFirstName format. Do not use spaces in between names.</p> <p><i>e.g., CostelloElvis, or ViennaPhilharmonic</i></p>	Required, if applicable
Description	<p>A brief description should be less than 10-15 characters.</p> <p><i>e.g., playbill, or brochure</i></p>	Required, if no Performer or Event is listed
Unique Number from the Camera	Use the unique number of the image generated from the camera.	Required, if applicable. If not applicable, see next component
Version Number	<p>If the document is a revised/edited version of a previous document, indicate the version number.</p> <p><i>e.g., v01, v02, v03</i></p>	Required, if applicable
Part Number and/or Camera Angle	<p>Use 'Part' + a number to indicate multiple parts or different camera angles of a single recording</p> <p><i>e.g., 20140624_ISA_AdamsRyan_Part01, or 20140624_ISA_AdamsRyan_ISO3</i></p>	Required
Generation	<p>Use to indicate the generation of video footage</p> <p><i>e.g., pres (for Preservation Master), mz (for Mezzanine), or (for Original), ac (for Access)</i></p>	Required
File format extension	<i>e.g., .tif or .jpg</i>	Required

If you have questions about naming digital files, please contact Archives (archives@carnegiehall.org)

Rights Metadata Best Practices and Guidelines

Metadata creation is one of the core activities of any organization generating and preserving digital assets. Rights metadata is a particularly crucial aspect of this process

because without this information the asset cannot be properly preserved, displayed, or disseminated. Researching the rights status of an asset long after its creation is an inefficient, time consuming process that becomes increasingly difficult as time passes. It is much safer and more efficient to record this metadata upon creation.

Based on industry best practices and recommendations made by The Getty Research Institute,¹² here are some guidelines for usable, shareable, re-purpose-able rights metadata that should be captured for every digital asset in CHA's care:

1. ***The name of the asset's creator.*** This should include the nationality, date of birth, and the date of death, if applicable.
2. ***The year the asset was created.*** Keep in mind that the year of creation may not be the year of publication. When two different dates exist, they should be identified separately.
3. ***Copyright status.*** One of the following five options can be selected from a controlled pick-list:
 - **Copyright owned by the institution.** The copyright is assumed valid and is owned by the institution that holds the work.
 - **Copyright owned by a third party.** The copyright is valid and is owned by someone or some entity other than the holding institution. If known, capture the name of the third party.
 - **Public domain.** If the work is determined to be in the public domain, it is helpful to identify the year in which the work entered (or will enter) the public domain, if known.
 - **Orphan work.** This is a work that may be protected by copyright law but for which the copyright owner or claimant cannot be identified or located.
 - **Not researched/unknown.**
4. ***Publication status.*** One of the following four options can be selected from a controlled pick-list:
 - **Copyright owned by the institution.** The copyright is assumed valid and is owned by the institution that holds the work.
 - **Copyright owned by a third party.** The copyright is valid and is owned by someone or some entity other than the holding institution. If known, capture the name of the third party.
 - **Public domain.** If the work is determined to be in the public domain, it is helpful to identify the year in which the work entered (or will enter) the public domain, if known.

¹² These recommendations come from the "Rights Metadata Made Simple" chapter by Maureen Whalen in Introduction to Metadata 3.0. Los Angeles: Getty Research Institute, 2008. A PDF may be found here: http://www.getty.edu/research/publications/electronic_publications/intrometadata/pdf.html

- **Orphan work.** This is a work that may be protected by copyright law but for which the copyright owner or claimant cannot be identified or located.
 - **Not researched/unknown.**
5. ***Date that rights research was conducted.*** If there are multiple dates on which rights research was conducted, best practice would be to include all of those dates, along with the initials of the researcher(s).