National Digital Stewardship Residency for Art Information
2018-19 Final Report

Preservation and Access of Digital Audiovisual Assets at the
Guggenheim

Host Institution: Solomon R. Guggenheim Museum
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Description of the Project

Background

Established in 1973, the Solomon R. Guggenheim Museum Archives contains a growing and diverse assortment of primary-source materials that reflect the historical development of the Museum, its activities, collections and exhibitions. In keeping with its mission to “collect, preserve, and provide access to all historical documentation…for the purpose of administrative support and historical research,”1 the Archives actively acquires records that are generated by the Museum’s departments and have significant long-term and/or legal value, making most of those materials accessible to internal staff as well as qualified researchers by way of individual appointments.

The Museum’s digital archiving activities can be traced back to 2014, when the Archives initiated an 18-month Electronic Records Management Start-Up Project2 with support from the National Historical Publications and Records Commission. This initiative helped the Archives to gain better control over the collection and management of internally-generated, born-digital records, and also laid the necessary groundwork for future digital archiving activities. Through a series of iterative pilot projects, the department established an OAIS repository, set up a workstation for ingesting files from obsolete media, and created methods for staff to submit their electronic documents to the Archives using transfer folders on the Museum’s network.

Despite these advancements, however, there were several categories of digital records that could not be addressed within the Start-Up Project’s limited timeframe. These included “very large files (e.g. video),” which were designated as “problem records” in one of the project’s final reports, along with “Obscure or Specialized Formats,” “Significant E-mail Correspondence,” and “Guggenheim Websites.”3 While a pilot project had originally been designed to strategize the Archives’ handling of video files, it could not be executed due to time constraints, and the issue went unresolved for several more years. Through its participation in the 2018-19 National Digital Stewardship Residency for Art Information (NDSR Art) program,4 the Archives gained an opportunity to pick up where the Start-Up project left off, and to formulate an action plan for collecting, processing, preserving and providing access to all of the Museum’s diverse collections of digital audiovisual assets.

Project Overview

As it was originally conceived, the objective of this NDSR Art project was to assess the Museum’s existing digital ecosystem, identify media-related problem areas and access needs, and ultimately propose a comprehensive and cost-effective plan for improving the preservation and access of all digital audiovisual materials managed, collected and/or generated by the Museum.

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1 https://www.guggenheim.org/finding-aids/collection/a0044
3 https://media.guggenheim.org/content/pdf/new_york/SRGMThree-TieredPlanforManagingElectronicRecords.pdf
4 http://ndsr-pma.arlisna.org/about/
The initial project narrative specifically focused on three asset groups: digitized archival assets, time-based media artworks and in-house video productions.\(^5\)

The information-gathering stages of the project entailed a combination of hands-on analysis and higher-level research. The resident identified levels of access needs for different types of video materials by interviewing stakeholders across museum departments, gained an understanding of in-house production workflows by working in close coordination with content creators, and researched potential solutions for the Museum’s existing preservation and access infrastructures by studying current and emerging technologies in the field of digital preservation at large, primarily by speaking with specialists at other cultural heritage institutions.

The “hands-on” component of the project involved analyzing and stabilizing several different collections of born-digital video materials that had not been transferred to or processed by the Archives. Treating these collections as case studies, the resident compiled a series of collection assessments that detailed approaches to their archival ingest, appraisal, processing and long-term preservation.

**Goals**

As outlined in the original project narrative, there were four primary components of the Museum’s existing digital preservation activities that the NDSR project was intended to address and ultimately improve upon: (I) Storage Infrastructure, (II) Data Integrity, (III) Access Levels, and (IV) Metadata. These goals are listed below along with corresponding targets for research and recommendation.

I. **Storage Infrastructure**: Storage redundancy, backup and retrieval protocols for all digital repositories.

II. **Data Integrity**: Data integrity verification, fixity checks and submission and ingest procedures applied to digital audiovisual assets.

III. **Access Levels**: Access levels needed for different content types, appropriate access platforms, file formats and metadata for digital media and artworks.

IV. **Metadata**: Technical and descriptive metadata requirements for different audiovisual collections; enhanced discovery and interoperability of assets across repositories through the application of technical and descriptive metadata.

**Project Scope**

The production, collection and stewardship of digital video materials is distributed among several departments within the Museum; principally between the Library and Archives, Theater and Production Services, Digital Media and Conservation departments. Each of these units has developed their own, specifically-tailored workflows for managing the digital audiovisual collections under their care, all of which are unique in terms of their contents, size, and distinct requirements for storage, description, preservation and access.

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The Archives contains several collections of audiovisual materials that the department digitized and processed through a series of grant-funded projects. A significant amount of digitized content originates from the Archives’ Audiovisual Recordings and Reel-to-Reel collections, both of which have finding aids that are available on the Museum’s website. While the Archives has continued digitizing its analogue media holdings – most recently in connection with the Guggenheim’s Panza Collection Initiative – the resulting digital assets have been largely inaccessible to internal staff and outside researchers, as they have remained stored in the department’s repository rather than being uploaded to the Museum’s digital asset management system (DAMS).

In addition to digitized archival materials, the Guggenheim also has an increasingly large amount of born-digital video content. There are two departments – Theater and Production Services and Digital Media – that actively generate videos in connection with the Museum’s exhibitions, public programs and initiatives. Most of this content is public-facing and distributed online—primarily through the Museum’s YouTube channel. However, there are no established workflows in place for either preserving the online videos or for making their underlying footage and related production elements internally accessible on the DAMS. As a result, production departments have assumed responsibility for storing and providing access to their assets independently of the Archives, amassing large backlogs of unprocessed video files that few others within the Museum are either aware of or know how to access.

A third category of the Guggenheim’s digital audiovisual materials are contemporary, durational and media-based artworks, which are stewarded by the Museum’s pioneering time-based media art (TBMA) conservation program. The Guggenheim has maintained a leading position within the field of TBMA conservation since it launched the Variable Media Initiative – an unconventional strategy for preserving ephemeral art works – in 1999. Since then, the Museum has continued to expand on its exploration of conservation methodologies for ephemeral, performative and media-based art works through various endeavors, including, most recently, the Conservation of Computer-based Art Initiative (CCBA), an ongoing research project co-organized by the New York University’s Computer Science Department.

Despite the robust processes developed by the Conservation department – and most notably by Joanna Phillips, the former Senior Conservator of Time-based Media – the Museum has yet to implement the storage, software, and technical infrastructure necessary for providing sufficient access to viewing copies of its TBMA works. Limitations on accessibility – as well as other storage

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6 https://www.guggenheim.orgfinding-aids/collection/a0070
7 https://www.guggenheim.orgfinding-aids/collection/a0004
8 https://www.guggenheim.orgconservation/panza-collection-initiative
9 https://www.youtube.comchannel/UC_hrVzPNMeC6nwMzoD6Gj6w
10 https://www.guggenheim.orgconservation/variable-media-initiative
and bandwidth-related problems – have hindered the Museum’s ability to fully activate its collection and also consumed valuable staff time for the Conservation department.

The decision to apply for the NDSR Art program emerged out of an ongoing conversation between staff in the Archives, Conservation and two production departments around the need to streamline the Museum’s storage, preservation and access systems for all digitized and born-digital audiovisual assets. There was wide-spread agreement that the siloed nature of the institution’s digital repositories, storage systems and content management platforms — as well as inconsistent and unstandardized metadata practices — had made the Museum’s audiovisual materials undiscoverable to internal staff, inaccessible to the public and outside researchers, and difficult for the relevant departments to systematically preserve. While efforts to resolve these issues had been informally and sporadically pursued for years, there was considerable interest in bringing in a full-time resident to focus exclusively on addressing and remediating the problem, by forming a unified preservation and access action plan for all categories of digital media.

Internal Project Partners
Over the course of this year-long residency, there were many different stakeholders both within and outside the Museum who shared their valuable insights, knowledge and guidance, all of which proved instrumental to the successful completion of the project.

Primary Host Mentor
Tali Han, Archivist and Manager of Library and Archives, served as the resident’s primary mentor. Tali provided significant and consistent support throughout the residency by participating in bi-weekly strategizing and check-in meetings, facilitating introductions to key institutional stakeholders, and collaborating on advocacy-raising presentations at various department meetings and cross-departmental discussions. While simultaneously overseeing several other grant projects, interns and fellows, Tali dedicated a considerable amount of her already limited time to making this project a success. The resident benefitted in any number of ways from the knowledge, mentorship, and professional development opportunities that Tali shared, and it is clear that her continued commitment to realizing the project’s goals beyond the conclusion of the residency will ultimately bring about great improvements to the Museum’s digital stewardship.

Working Groups
Through participating in a cross-departmental Digital Audiovisual Asset Working Group that was formed at the start of the project, the resident gained valuable insights into the needs, incentives, and priorities held by the various stakeholders to whom video production, preservation, and access are most directly relevant. Working group meetings were held on an as-needed basis, and occurred with greater frequency as work on the project progressed, especially as the process of drafting a digital preservation policy was initiated in later months of the residency.

The Digital Audiovisual Asset Working Group was comprised of representatives from the following departments:
• Education (Public Programs)
• Publishing & Digital Media
• Theater & Production Services
• Information Technology
• Curatorial
• Conservation

While collaborative partnerships were formed with representatives from all of these departments, the resident worked in particularly close coordination with IT staff, who offered crucial assistance during the resident’s survey of the institution-wide storage infrastructure, helped with cost modelling and research by sourcing data on the Museum’s server usage and back-end administration of its storage and network systems, and continually advocated for the project’s goals in meetings with stakeholders.

In addition to the Digital Audiovisual Working Group, a smaller Digital Asset Working Group also began meeting on a regular basis to brainstorm and exchange strategies for integrating metadata across MediaBeacon,\(^{13}\) the Museum’s DAMS, its collections information software The Museum System (TMS)\(^{14}\) and archives management database ArchivesSpace\(^{15}\). These meetings are planned to continue beyond the conclusion of the residency, with participating members from the following departments:

- Photography (MediaBeacon)
- Registrar (TMS)
- Archives (ArchivesSpace)

Other Internal Stakeholders
Collaborative partnerships were also formed with staff across a wide range of other departments. These individuals significantly contributed to the resident’s understanding of the Museum’s organizational structure, behind-the-scenes activities, existing priorities and resources:

- Exhibition Management
- Marketing
- Interactive
- Library

External
ARLIS/NA Host Mentor
The resident’s ARLIS/NA mentor was Lori Salmon, currently the Head of New York University’s Institute of Fine Arts Library. Lori provided valuable career advice and supported the resident’s

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13 https://www.mediabeacon.com/en
15 https://archivesspace.org/
project research in various ways, facilitating connections with colleagues at other cultural organizations and promoting a public-facing panel discussion that the resident organized as part of their NDSR Site Visit. Despite her busy work schedule, Lori regularly arranged to meet in person, corresponded over email, and even scheduled a tour of the New York Public Library’s Stephen A. Schwartzman building for everyone in the Guggenheim’s Library and Archives department.

Outside Specialists
While conducting research on possible storage and preservation solutions for the Guggenheim’s digital media, the resident spoke with specialists at other cultural heritage institutions to learn about their workflows, policies and software. These conversations helped the resident gain a fuller understanding of the range of current and emerging technologies within the field of digital preservation and lent necessary context to their final project recommendations. The following individuals generously shared their time and expertise over the course of the residency:

- Frances Lloyd-Baynes – Head of Collections Information Management, Minneapolis Institute of Art
- Amy Brost and Peter Oleksik – Assistant Media Conservator and Associate Media Conservator at the Museum of Modern Art
- Amye McCarther – Archivist, The New Museum
- Sumitra Duncan – Head, Web Archiving Program, NYARC
- Luciano Johnson and Marian Clarke – Chief of Collections Preservation and Lead Digital Archivist, Frick Art Reference Library
- Josh Hadro – Managing Director, International Image Interoperability Framework
- Nick Krabbenhoeft – Digital Preservation Manager, the New York Public Library
- Alexandra Nichols – Sherman Fairchild Fellow in the Conservation of Time-based Media, the Metropolitan Museum of Art
- Ashley Blewer – AV Preservation Specialist, Artefactual Systems
- Emily Rafferty – Head Librarian and Archivist, Baltimore Museum of Art
- Andrew Berger – Digital Archivist, Computer History Museum
- Erin Barsan – Archives & Collections Information Consultant, Small Data Industries
- Janeen Schiff – Archivist, Dia Art Organization
- Teague Schneiter and Brendan Coates – Senior Manager and Archivist, Oral History Projects, Academy of Motion Pictures Arts and Sciences
- Cate Peebles – Museum Archivist, Yale Center for British Art
- Coral Salomon – Digital Strategies Librarian, University of Pennsylvania
- Rachel Ward – 2018-19 NDSR Art Resident, Small Data Industries
- Molly Szymanski - 2018-19 NDSR Art Resident, Art Institute of Chicago
- Cristina Fontánez Rodríguez - 2018-19 NDSR Art Resident, Maryland Institute College of Art
- Kristen Regina – Arcadia Director of the Library and Archives, Philadelphia Museum of Art; Program Director, NDSR Art
- Karina Wratschko – Digital Initiatives Librarian, Philadelphia Museum of Art; Program Manager, NDSR Art
Project Execution

Project Alterations

While there were no significant alterations to the project as it had originally been planned, the departure of Joanna Phillips, formerly the Senior Conservator of Time-based Media, ultimately contributed to a slight redirection in terms of the project’s scope and focus. As one of the main contributors to the Guggenheim’s host application for NDSR Art, Phillips was written into the proposal as a Secondary Mentor. The initial project timeline had also stipulated that the resident would spend several weeks at the Conservation building analyzing the department’s storage systems and documentation and metadata workflows. When Phillips transitioned out of her role at the Museum, however, this plan was no longer possible, and as the project progressed, TBMA gradually became less central to the resident’s overall research.

Despite this unexpected circumstance, the resident was fortunate to be able to interview Phillips before she left the Guggenheim, and this conversation greatly informed their understanding of the Conservation department’s already well-established workflows, procedures and standards for TBMA. As more information was gathered on the project’s other content categories, though, in-house video productions took on a slightly higher level of priority, as these materials were found to have fewer resources, dedicated staff and documented practices in place for their description and preservation than TBM works.

Internal Surveys and Research

Training

During their first few months at the Museum, the resident received training in all software used for cataloging, processing and providing access to digital audiovisual assets and their related information. This entailed attending orientation sessions on the usage and features of MediaBeacon, TMS, and ArchivesSpace, as well as gaining familiarity with Archivematica - the preservation software used by the Archives – through hands-on experimentation, consulting online documentation, and attending user forums.

There is currently no integration between MediaBeacon, TMS, and ArchivesSpace, and metadata is represented differently by each database. As such, researching how the systems would interact with the asset groups addressed by this project was a complex process that required continual study, and will also serve as a focal point for ongoing research and discussion by members of the Digital Asset Working Group beyond the residency’s conclusion.

Survey of Digital Repositories and Systems

TMS

At the Guggenheim – and at many other art museums in the U.S. - TMS functions as the central repository for all collections-related information. The database is actively-updated and widely-used across the Museum as both an authoritative reference and as a recordkeeping tool,

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16 For the original project timeline, see Appendix I.
17 https://www.archivematica.org/en/
particularly for departments that oversee exhibitions and loans, collections care, curatorial research, and other core activities. The software is configured with modules that can be interrelated, which allows the relationships between objects, exhibitions, loans, etc. to all be represented within the same system.

While TMS supports interoperability with some other DAMS software, the database is not currently integrated with MediaBeacon. This inability to centralize collections-related information across TMS and DAMS consequently prevents any art and performance-related documentation on MediaBeacon from linked to corresponding records in TMS. As a result, many of the most frequent users of TMS – including curatorial and conservation staff – are not able to determine if the Museum has video footage of an a collection item, exhibition or event when they perform a search for that record on TMS. Resolving this problem fell somewhat outside the scope of the resident’s project, but the previously mentioned Digital Asset Working Group has been exploring various, bespoke solutions for linking TMS records with associated assets on the DAMS.

ArchivesSpace
The Archives uses ArchivesSpace, an “open-source web-based archives information management system,”18 for processing, descriptively cataloging, and publishing finding aids for its accessioned collections. Since it first implemented the application in 2015, the Archives has utilized ArchivesSpace to accession a number of its digitized audiovisual collections, but not for any born-digital video content. As newly-generated media became increasingly central to the scope of this project, and the resident began to dedicate more of their time to assessing and compiling preservation plans for unprocessed, born-digital video materials, relatively limited research was done on ArchivesSpace, as it only used for accessioned assets and processed collections. Given more time, however, the resident would have been interested to explore how the system might factor into workflows for cataloging large and complex born-digital video collections at the item-level.

MediaBeacon
Throughout this project, the resident focused keenly on identifying ways to expand the institution-wide usage of MediaBeacon as the primary tool for uploading and viewing digital video materials.

At present, the Guggenheim utilizes an outdated version of MediaBeacon that, while capable of supporting video uploads and streaming, has seldom been used for those purposes. Instead, the platform’s main function has been to provide internal access to digital photographs. This is partly because the decision to implement MediaBeacon as the Museum’s DAMS emerged out of the Photography department and its transition from an analogue to digital-based workflow. Since it was first installed, staff have grown accustomed to using the DAMS to access photographs, but are remarkably less aware of the platform’s ability to store digital video materials. In interviews,

18 https://archivesspace.org/about/mission
members of various departments expressed a sense of mistrust in the system’s potential to adequately handle video materials, despite acknowledging that implementing an institutional access platform for video content is badly needed at the Museum.

As is explained throughout the following sections, expanding the usage of MediaBeacon to encompass digital video materials would not only improve internal accessibility to the institution’s currently ‘hidden’ audiovisual collections, but also significantly improve the content management workflows of production departments and event managers.

Staff Interviews
Method
Over the first two stages of the project, the resident interviewed staff at 8 departments. In conducting these interviews, the aim was to develop a holistic understanding of the range of access needs, priorities and problem areas related to digital audiovisual materials across the institution.

Participants were selected from two primary stakeholder groups: media producers and ‘power users,’ or those whose work involved frequent interactions with digital video materials. In total, 2 interviews were conducted with media producers and the remaining 6 with power users, including staff in the Conservation, Curatorial, Exhibition Management (Media Arts), and Marketing departments.

In preparation for these interviews, the resident compiled questionnaires specifically tailored to the functions, roles and responsibilities of each of the surveyed departments, as well as their presumed usage of digital video. As this required some research, the resident referenced organizational charts, searched for information about departments on the Museum’s Intranet and website, and consulted with their project mentor about what subject areas would be most appropriate to cover.19

All of the interviews were conducted over the course of 1 hour and audio recorded with the participants’ consent. Once they had been manually transcribed by the resident, the recordings were then deleted. Participants’ responses were anonymized to the fullest possible extent in transcripts, with names and position titles edited out. While time-consuming to produce, these transcripts ultimately proved useful, and the resident continued to reference them well beyond the early information-gathering stages of their research.

Analyzing these texts also allowed the resident to identify recurring themes; particularly the access needs and problem areas that were shared between surveyed departments. Categories of commonly-shared problems and needs were then culled from the transcripts and tallied according to how many participants had brought them up during their interviews.

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19 For examples of the resident’s interview questions, see Appendix II.
A graphic representation of the categories of problem areas and access needs that the resident identified by collating qualitative data from interview transcripts.

Results
Across all 8 stakeholder groups, the most frequently mentioned access need and problem area both related to the accessibility of digital media, addressing the need for greater internal access to video materials on the DAMS as well as the problems caused by the lack thereof.

The qualitative data that was generated during this process helped to shape the resident’s project recommendations, and, when visually represented (as in the chart included above) served as demonstrative evidence of the need to implement those recommendations, which proved especially useful within the context of the resident’s advocacy-raising efforts; in internal presentations and meetings with institutional decision-makers.
External Research
In the third project phase, the resident investigated possible solutions to the storage and systems-related problem areas that they had identified during their surveys and staff interviews. Employing a two-pronged approach, the resident spoke with digital archivists and preservation specialists at other cultural organizations and also arranged for demos of selected preservation software.

During their various in-person and virtual conversations with individuals at other institutions, the resident inquired about the pros and cons of relevant repositories, workflows, and systems, and attempted to compare those to the methods employed at the Guggenheim. While there was little overlap in terms of the software used by the various organizations sampled for this research, it was nevertheless useful to learn about the requirements, criteria and other decision-making processes that institutions had factored into evaluating and ultimately selecting those platforms.

Software Solutions
Parallel to their external research, the resident organized 2 demos of preservation software that were attended by staff responsible for administering the Museum’s technical infrastructure, TMS and DAMS. Intended more as information sessions than business pitches, the demos were productive in that they prompted ongoing cross-departmental discussions about what criteria were necessary for selecting a potential digital preservation system and sparked debates over the benefits of open source, highly configurable systems versus more costly, turn-key alternatives.

Assessment of Existing Ecosystem
Starting in the second phase of the project, the resident began surveying all storage systems, software and digital repositories with digital audiovisual assets across the Museum. The primary targets of this survey were the Theater & Production Services, Digital Media, and time-based media Conservation departments.

One positive outcome of this survey was that it prompted the IT department to conduct an analysis of all the Synology servers in use across the Museum’s network, with the aim of eliminating unnecessary and resource-consuming redundancies, and also to consider how that storage space might be re-appropriated to better support the storage of larger digital media files, and video assets in particular.

Production Workflows
In addition to analyzing storage systems and assessing digital holdings, this survey required that the resident develop a holistic understanding of the video production workflows implemented by the Theater, Digital Media, and Conservation departments. In the process of mapping out

20 https://www.synology.com/
these workflows, the resident discovered surprisingly significant differences between the processes enacted, and challenges faced, by each department.

While the Theater and Digital Media departments both actively generate born-digital video materials that are ultimately distributed online, the nature of that content differs, as does the scale of production and amount of footage required for their creation.

Compared to these production departments, Conservation stands out as somewhat of an outlier. While the department occasionally documents performances, installations and artist interviews, for example, the videos it produces are intended for internal use only and stored on a department share drive that is inaccessible to the rest of the Museum.

Some contextual, background information for each of these 3 departments is provided below, along with a high-level description of their respective production workflows.

**Theater**
The Theater department is responsible for recording events that are staged in the Museum’s Peter B. Lewis and New Media theaters; around 77 recordings annually. These events typically feature topics, artists and themes that are in some way related to the Museum’s exhibitions and collections, with examples ranging from the recurring Annual Robert Rosenblum Lecture and Elaine Terner Cooper Education Fund Conversations with Contemporary Artists\(^2\) series, to multi-day, ‘one-off’ programs such as *Carrie Mae Weems LIVE: Past Tense/Future Perfect* (April 25-27, 2014),\(^2\) which was organized in connection with the Guggenheim’s retrospective *Carrie Mae Weems: Three Decades of Photography and Video*\(^3\).

Due to the programmatic nature of the content they record, the Theater department only performs minimal editing on its videos; typically nothing more than occasionally trimming extra footage at the beginnings and ends of certain recordings, and for videos that are published online, inserting title cards and credits where appropriate. Despite being relatively straightforward, this workflow nevertheless requires that the department rely on external contractors to carry out the full range of its post-production tasks, from ingesting and rendering raw footage to editing, naming and organizing video files.

Video production constitutes a significant portion of Theater’s responsibilities, but the events they record are actually conceived, organized, and presented by a number of other departments within the Museum, including the Curatorial, Development and, to a larger extent, Education department’s Public Programs division. Of all these, Public Program recordings consume most of the department’s time and resources, as Theater staff are currently responsible for overseeing

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\(^2\) [https://www.guggenheim.org/event/event_series/conversations-with-contemporary-artists](https://www.guggenheim.org/event/event_series/conversations-with-contemporary-artists)


all aspects of their production and management, including filming, naming and storing the recordings.

With its limited staffing levels and busy production schedule, the Theater department has not been able to implement systematic descriptive and organizational practices for all of the video assets it produces for other departments. This has caused particular complications for Public Programs staff, who are responsible for fielding the viewing requests they regularly receive from outside researchers. The lack of arrangement and standardized naming applied to files on the Theater department’s storage systems has hindered search, discovery and access and frustrated Public Programs’ efforts to source their requested materials.

Partly due to their own resource constraints, and partly because the Archives and DAMS also have limited storage and staff available, the Theater department has the added responsibility of storing and managing other departments’ event recordings, and a procedure has yet to be established for submitting those materials to the Museum’s archival repository and access systems. Based on all of this information, the resident identified two primary workflow-related problem areas that their project should attempt to resolve: I) establish workflows for submitting newly-generated event recordings to the DAMS and archival repository, and II) address the large backlog of assets that have not been submitted to or processed by the Archives.

Digital Media
The Digital Media department oversees the creation of all online video content related to the Museum’s exhibitions and special initiatives, as well as the documentation of art and performance works that are staged at the Guggenheim. Most of these videos are promotional by design and published on the Museum’s YouTube and social media channels.

Unlike the Theater department’s event recordings, videos created by Digital Media often involve durational filming periods that can in some cases last for weeks, generate large quantities of footage, and require extensive editing – especially when they are produced for the Museum’s ‘special projects,’ like the UBS MAP Global Initiative.

The Guggenheim UBS MAP Global Art Initiative (MAP) was a 2012-2018 collaboration between the Museum and UBS that focused on global contemporary art. Provided with generous funding from this initiative, the Museum was able to add 126 artworks to its permanent collection, participate in the organization of 8 travelling exhibitions around the world,²⁴ and produce extensive video documentation of the project’s contributing artists, curators, and institutions, as well as its related performances, public events, and programs.²⁵

Over the course of its six-year run, the MAP initiative yielded a total of 144 videos that were published on the Museum’s social media platforms, including its YouTube, Instagram, Facebook, Twitter, now-defunct app and Brightcove accounts. While this already constitutes a large

²⁴ [https://www.guggenheim.org/map#about](https://www.guggenheim.org/map#about)
²⁵ [https://www.guggenheim.org/map](https://www.guggenheim.org/map)
amount of content, it represents only a small fraction of all the unedited and b-roll footage, project files and various media elements that went into the videos’ production.

As part of its Storylines: Contemporary Art at the Guggenheim exhibition in 2015, the Museum organized a 24-hour viewing-party around the premiere of Agathe Snow’s Stamina (2005), a 24 hour film that documents a party the artist herself hosted in 2005. The event was staged in the Guggenheim rotunda and documented by a camera crew for all of its 24 hours. This footage was ultimately edited by the Digital Media department and output as a 5-minute time-lapse video that was posted online. Despite the sheer amount of content, the underlying footage was retained in full. But plans for processing, cataloging and uploading the video assets to the DAMS have yet to formalize. With its direct relevance to Stamina, a work accessioned by the Museum, the premiere footage would ideally be represented on TMS and linked to both the related object record and the video’s location on the DAMS.

Organized by UBS MAP Curator Pablo Leon de la Barra and staged at the Guggenheim in 2017, Latin American Circle Presents: An Evening of Performance was the first public event presented by the Guggenheim’s Latin American Circle, a collectors’ group focused on promoting awareness of and access to contemporary Latin American art. The event centered around the premiere of 3 performance artworks by OPAVIVARÁ!, Amalia Pica, and Naufus Ramírez-Figueroa that were accessioned by the Museum. As with the Stamina premiere, video documentation was produced for all 3 of these performances, including their pre and post-shows, and abbreviated versions of the recordings were distributed online. However, the unedited footage has yet to be processed, cataloged or made internally accessible on the DAMS.

The Digital Media department occasionally outsources aspects of its production work to external contractors, but for the most part there is only one full-time staff member who performs every stage of the video production process, from videography to editing and asset management. The department’s primary function is to deliver videos for online publication, and with already limited staff, it has not had the time to standardize file naming or establish regular workflows for submitting its videos to the Archives and DAMS. As a result, the department has amassed a large backlog of born-digital video materials that are stored on removable media from both current and former staff members.

Conservation
During her 11-year tenure at the Museum, former Senior Conservator of Media Joanna Phillips developed numerous best practices, processes and documentation methods that were foundational to all aspects of the Museum’s TBM conservation efforts. Phillips placed great

27 https://www.guggenheim.org/artwork/34389
28 https://www.youtube.com/watch?v=OGceMTDOvTU
emphasis on documenting both the intentions of the artist as well as the specific, variable qualities of their work. In certain cases, this entailed producing videos of artist interviews, documenting art performances and recording the installation of media-based works. As Phillips explained in an interview conducted before her departure, however, the department typically avoided using video to record this information, and instead opted for audio whenever possible to save on storage and other resources.

At present, all of the department’s video materials are stored on a share drive that is accessible only to Conservation staff. As they pertain directly to the care of works in the Museum’s collection, the videos are considered permanently active and neither submitted to the Archives nor uploaded to DAMS. The lack of accessibility to this art-related documentation has limited other departments’ awareness about the existence and availability of these valuable resources.

Survey of Production Departments

In surveying the Theater & Production Services and Digital Media departments, the resident gathered information on working and inactive storage hardware, network attached drives, and file naming and organizational practices. These areas were highlighted over others based on earlier staff interviews in which both departments mentioned struggling with the lack of discoverability and standardized description applied to their video assets, as well as the large backlog of storage media that they had collected from former staff members and not transferred to the Archives.

The first step entailed inventorying the departments’ storage hardware, including all of their removable media, RAIDs and scratch drives. In this process, the resident discovered that both Theater and Digital Media were storing their newly-generated and ‘archival’ video materials on drives that were not backed up and had already been in use for around ten years. Given the risks for possible media failure and information loss, backing up the departments’ at-risk storage devices became one of the resident’s main priorities.

After consulting with both departments, the resident gathered the drives selected for backup and coordinated with staff in the IT department to secure the necessary equipment for transfer, including a Mac computer tower that was installed on the resident’s desk for accessing the Apple configured hardware. An appropriate amount of storage space was also allocated on one of Museum’s servers, providing a secure location to transfer the files. In addition, a license to the software TreeSize Professional[^31] was purchased for the resident to perform more efficient, detailed and comprehensive analysis of the backed-up drives’ contents.

Over the course of several months, the resident successfully backed up 5 out of 6 of the Theater’s at-risk RAID drives[^32] and compiled a collection assessment that detailed

[^31]: https://www.jam-software.com/treesize/
[^32]: One of these drives malfunctioned and had to be transferred to the IT department for further examination and possible repair.
recommendations for processing all of the video assets stored on the department’s Network Attached Storage (NAS) system.

Using this same transfer method and backup server location, the resident copied over the contents of one 6 TB RAID drive that had been left at the Digital Media department by a former Producer on the UBS MAP initiative. Treating this large collection of special projects-related media as a case study, the resident crafted selection and appraisal criteria for the transferred video files and outlined other solutions for processing the drive’s contents in another collection assessment.

Conservation
As the Conservation department had already established robust workflows for the ingest, fixity, and metadata applied to artworks, the resident did not conduct in-depth analysis on those practices or on the department’s art work server. Instead, the resident focused on non-collection video materials that were stored on the department’s share drive. Using TreeSize to generate inventories, the resident categorized the video files contained on the drive according to their corresponding content type and level of access needs. This and the broader share drive analysis indicated that the Conservation department produced much more video content than staff appeared to be aware of who, at least according to the resident’s previously-conducted interviews.

Results and Analysis
Theater & Production Services
To determine the extent of all Theater-generated video content that not been transferred to the Archives, the resident targeted 2 of the department’s storage devices: 1) its network attached storage system (NAS), and 2), the 5 RAID drives that had been backed up to the museum’s network earlier in the survey. Scans were conducted on both systems to identify file types, formats and redundancies, and inventories were used to cull descriptive information from file and folder names.

Given the project’s limited timeframe, it was not possible to fully examine both storage targets in equal depth. Backups of the department’s 5 RAID drives were finally completed during the last quarter of the residency, leaving little time to analyze their combined 15.3 TB of video data. For this reason, only the assets contained on the Theater’s NAS were reviewed for appraisal purposes, but the general recommendations included throughout this and other internal reports were formed holistically to include the contents of all systems.
At present, there are 557 video files – a total of 8.7 TB – stored on the Theater department’s NAS. These assets have no descriptive metadata and their file names and folder structure are unstandardized, inconsistent and at times indecipherable.

The directory structure on the NAS lacks any clear system of arrangement. There is no hierarchical organization or discernible relationship between root and sub-folders, and folder names are unstandardized, often giving no indication of what they contain. Finding and tracking files would seem to require the kind of extensive previous knowledge that few others outside of – or even within – the Theater department might reasonably possess.

File naming is also unstandardized and irregular on the NAS, further detracting from the discoverability of Theater’s video assets. A large cause of this roots from inconsistency, particularly and most consequentially in terms of date formatting. Date elements are usually included in the department’s file names, but there is little uniformity in either the order or
notation used to indicate year, month and day. Years are variously represented as two and four-digit numbers (YYMMDD), and others are ordered according to international and European standards that in some cases place year at the end of the string instead of at the start (MMDDYY). Unpredictably formatted date elements are especially problematic for the Theater department, as their recordings are most frequently searched for by event date.

The disorganization and lack of context provided for video files on the NAS has also negatively impacted Public Programs staff, who, as event managers, are often the first to field viewing requests. With no descriptive metadata attached to the video assets on the NAS, Programs staff often rely on the content-related information included in file names to source their request assets. This can result in time-consuming searches and frequent back-and-forth communication between departments that ultimately drains staff time and delays the fulfillment of viewing requests.

With only 3 full time staff members, the Theater department employs external contractors to carry out the various tasks involved in its content management workflows, from organizing and naming files to compressing and deleting unnecessary footage. The application of these practices, however, tends to vary between individual contractors, resulting in greater inconsistencies in file naming and arrangement.

Descriptive cataloging and the collection of related documentation are essential steps towards ensuring that digital materials remain identifiable, discoverable and preserved in the long-term. However, contextual information is most easily gathered at or near the time of its creation, not months or years after work on a project has ended. Delaying the collection, description and archival submission of media assets creates only more work for the Archives down the line. Processing the amount of backlogged event recordings that are currently stored on the Theater’s NAS will inevitably amount to a laborious and time-consuming task for the Archives, potentially expending resources that the department might need for other backlogged collections and outstanding projects.

Rights-related documentation constitutes another form of contextualizing information that is currently missing from the Theater’s NAS. While potentially stored elsewhere within the Theater or some other department – a subject for future research – the absence of speaker agreements, release forms, contracts and other rights documents could prevent the department’s program recordings from being re-used or otherwise made publically available in the future. Regularly collecting and storing these documents along with their related event recordings would decrease the risk that the information they contain will be disconnected.

**Digital Media**

In surveying the Digital Media department’s storage systems and production workflows, a current staff member identified 16 hard drives that had belonged to former personnel. Due to the sheer amount of content they contained, the storage devices were not able to be transferred to the Archives and thus their files were never reviewed.
As a first step towards assessing these storage media, the resident compiled a preliminary inventory that documented the physical condition, make and model, and technical dependencies of all 16 hard drives. In consulting with the current Digital Media Producer, it became clear that a majority of the storage hardware had not been backed up, and that most of the drives were at least several years old, likely exceeding the ends of their expected life spans.

Hard drives have a limited shelf life, and most are expected to last no longer than ten years after the time of their initial production. Any digital assets that are stored on removable storage can easily become inaccessible and even irretrievably lost in the event of media failure, and standards such as the NDSA Levels of Preservation stipulate that creating at least one secondary copy of storage media constitutes a baseline, “Level 1” requirement for digital preservation. As such, backing up all of the hard drives in this collection was recognized as an urgent step that would need to be taken.

However, given the amount of storage that would be required to accommodate transfers of all 16 hard drives, the resident began by backing up one 6TB RAID drive that had belonged a former Producer for UBS Map. In consulting with the current Digital Media producer, this drive was prioritized because it held all original media associated with UBS as well as 2 events that were staged at the Guggenheim in connection with accessioned art works. In notes left by the former Producer, the drive was described as containing all “consolidated project files” generated during their own work at the Museum as well as their corresponding initiatives.

After copying the files contained on the 6 TB RAID drive onto an under-utilized server space on the Museum’s network, the resident used TreeSize Professional software to scan the drive’s files, generate inventories, and output various reports, including:

- Inventories: File-level for all file types/extensions
- Folder directory trees
- File redundancies identified by the “Duplicate Search” tool

The backed up hard drive was found to hold a total of 5.5 TB of storage data, with 4.6 TB consisting of video files.

33 https://ndsa.org//activities/levels-of-digital-preservation/
Pie chart of the files stored on the Digital Media department’s backed up UBS hard drive, as generated by the software TreeSize Professional

While not uniformly consistent, the drive’s original directory structure, file arrangement and naming system was coherent, intuitively navigable and well-documented. The former UBS Producer had created several ‘read me’ text files and spreadsheet documents that mapped out the contents of the drive, decoded the abbreviations used in file names and indicated where materials might be duplicated elsewhere. This documentation served as a useful guide for understanding the different types of assets that were created for each of the project deliverables and provided rich insights into the logic, planning and decision-making processes that factored into video production for this initiative overall.

Within the drive, the root folder structure is for the most part organized according to the video deliverables produced for each UBS project phase:

The naming scheme applied to these folders includes many descriptive elements about their contained contents, specifying: MAP project phase, video content type, artist and/or exhibition initials, video number, month and year, and deliverable type. A consistently uniform structure is
also applied to all of the deliverables’ sub-folders, including buckets for ‘Deliverables,’ ‘Media,’ and ‘Premiere,’ indicating the editing software project files.

Despite its clear system of arrangement, however, the drive contains a large and structurally complex collection of materials that will undoubtedly be challenging for the Archives to process given its existing storage and staff resources. Each of the 144 videos produced for this initiative is composed of numerous production components and media that would ideally be consolidated as 144 individual archival submission information packages. But gathering all the necessary materials for each submission would require careful, systematic, and time-consuming work, especially as there are multiple share drives within the Museum’s network that may contain UBS-related materials that are not duplicated on the backed-up drive.

Furthermore, the Museum’s DAMS currently lacks the storage space, bandwidth and processing power to accommodate the large amounts of digital video files that this report recommends for upload and internal access. Given that there are other, potentially higher-priority materials that also need to be uploaded to the DAMS, it may not be possible to make these materials accessible on the platform for some time.

**Conservation**

The Guggenheim’s TBM conservation department typically documents artist interviews using only audio recording; this saves on both storage space and potential production costs while capturing essentially the same information, if not somewhat less nuanced and dynamic in form.

In surveying the Conservation department’s share drive, the resident targeted two locations on the drive using TreeSize: one scan targeted files within the ‘SRGM Reports’ sub-folder for ‘Object Reports’ and the other scanned the contents of the ‘Artist Interviews’ folder.

Within ‘SRGM Reports,’ TreeSize found 594.8 GB of video files; about half of all extension types represented within the folder. Drawing from content information indicated in the file and folder names listed in inventories, the resident identified several different categories of video materials stored at this location, including installation videos, screen recordings, references for iteration histories, and art work production documentation, among others.

The scan of the ‘Artist Interviews’ folder identified 301.8 GB or 49 video files that pertained to the department’s internally-produced artist interviews. These videos contain documentation of interviews conducted with 16 different collection artists.

While they are valuable research resources, these videos are not currently accessible to a majority of the Museum’s internal staff as they are stored within the Conservation department’s access-restricted share drive. Any appraisal decisions regarding the video assets stored within the object reports and artist interviews folder should ultimately be made by staff in the Conservation department. As there is currently no interoperability between TMS and MediaBeacon, it is unclear how information about these collection-related materials would be represented on both systems in a unified and effective fashion.
Recommendations and Next Steps

Revised workflows for newly-generated event recordings

In coordination with the Archives, Public Programs, and production departments, the resident crafted new workflows for the submission of newly-generated video materials to the archival repository and DAMs and compiled guidelines on file naming, organization and attaching descriptive metadata to video files.

The proposed workflow for newly-generated event recordings reflects several alterations to the roles and responsibilities enacted by staff in the Public Programs, Theater, and Archives departments, with content creators assuming responsibility for the standardized file naming of their output video files, regularly depositing those files onto a dedicated transfer folder on the Theater’s NAS, and inputting basic descriptive metadata into a Submission Form. Event managers – in most cases Public Programs – will then take over verifying and further cataloging recordings, as well as tracking and depositing all rights-related information on the NAS. Finally, the Archives will periodically collect the files deposited on the ‘To Archives’ folder on the NAS and transfer those assets to the department’s server system for processing. All of these contributing departments will work together to ensure that the proposed processes are consistently and uniformly carried out.

Adhering to the workflow outlined below, the Theater department will gain the ability to consistently transfer their materials to the Archives, while also ensuring that the videos they produce, along with their corresponding information, are efficiently and effectively tracked, managed, and made discoverable to the department’s own staff members as well as the rest of the Museum.

This new workflow will entail the following steps:
1. For every new event recording, the Theater department’s contractors will produce 2 versions of the same final recording: 1 relatively high resolution ‘master’ file output at 1080p and 1 ‘access’ file compressed to 720p.

2. File names for the master and access copies are formatted according to a standardized convention that includes only the event date and video file type.

3. The files are then saved to a dedicated ‘To Archives’ transfer folder on the Theater’s NAS, with both files contained within the same sub-folder that is named with the recording’s corresponding event date.

4. Using a Submission Form template available on the transfer folder, contractors catalog their newly-generated video files with the appropriate event title and date, and save a copy of the form to the sub-folder created in the previous step, applying the same naming convention used for video assets.

5. Once these steps are complete, Public Programs staff access the NAS to verify the accuracy and completeness of the metadata entered by Theater contractors in the Submission Form, and add any further information that may be relevant to the recording’s reuse and/or preservation, including featured speakers, keywords, and/or applicable restrictions that may have been requested by featured speakers.

6. Public Programs staff will save all relevant rights-related documentation to the same sub-folder on the NAS, and applying the same naming convention used for the master/access video files and DAMS submission form.

7. Archives and DAMS administrators will then retrieve the deposited master and access event recordings, corresponding submission form and any rights-related documentation from the appropriate ‘To Archives’ sub-folder on the NAS and transfer those files to their respective system’s storage repositories for further processing.

8. Having successfully migrated these materials, the Archives and DAMS administrator will notify the Theater department that all underlying raw footage, project files, and draft versions of the now-transferred event recordings may be deleted from the contractor’s scratch drives.

File Naming
For the most frequent users of this content – Public Programs staff, Archives, production contractors – one of the greatest access-related issues is the lack of discoverability for video assets on the Theater department’s storage systems. Finding a particular file requires searching through multiple devices, navigating complex directory structures and parsing indecipherable filenames. As a first step towards alleviating these problems, the Theater department should adopt more consistent and intuitive file management practices.

Theater department contractors should assume responsibility for implementing standardized file naming for all newly-generated, finalized videos they deposit on the ‘To Archives’ transfer folder (as described in the previous recommendation). Doing so would significantly improve the discoverability of their assets in the short-term while also helping both the DAMS administrator and Archives staff to correctly and easily identify the files’ contents once they have been copied over to their relevant repositories.
Instead of overloading video files with descriptive elements like event titles and featured speakers, content creators should adopt a pared down, intuitive and comprehensible naming convention that includes only the date of the event – formatted according to the international standard for date and time format ISO 8601\(^\text{34}\) – and an indication of whether the file itself has been formatted as a ’Master’ or ’Access’ copy. For durational and/or multi-day programs, a ’part’ number may also be included at the end of file names to delineate their sequential order.

**Proposed naming convention:** YYYYMMDD_VideoType_Part# (if relevant)

Example: 20190603_Master_pt01

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**DAMS Submission Form**

The Guggenheim’s existing DAMS Submission Form template

The DAMS Submission form template that will be saved to the ‘To Archives’ transfer folder on the NAS will be formatted to include separate sections for both the Public Programs staff and Theater department contractors to reference as they enter and/or verify descriptive metadata associated with event recordings. The required fields for each department and recommended formatting for that information will be indicated along with example entries.

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\(^{34}\) [https://www.iso.org/iso-8601-date-and-time-format.html](https://www.iso.org/iso-8601-date-and-time-format.html)
The required fields for Theater contractors will include only ‘Title of Event’ and ‘Date of Event,’ with the optional entry of ‘Event Manager’ or commissioning department.

Public Programs staff should verify the information entered in these fields – particularly Title of Event – and also fill in the required fields for ‘Name of Featured Speaker | Artist | Performer’ and ‘Rights Usage Terms.’ With the understanding that more information is better than less, entries may be made for optional fields where appropriate.

To Archives Directory Structure
The ‘To Archives’ transfer folder on the NAS should contain a Submission Form template and a ‘README’ text file that outlines the proposed file and folder naming conventions and provides instructions on completing the submission form. This document should help to ensure that the proposed workflow is followed and maintained in the future, regardless of any potential staff turnover.

For multi-part recordings – primarily of events that last for several days – folder names should reflect the corresponding date range, formatted as follows: YYYYMMDD-MMDD.
The sub-folders created for every event recording should include: the ‘master’ video file, submission form, and any relevant rights documentation.

Additional Considerations

**Access Files**
The recommendation to produce access versions of all event recordings is made under the assumption that MediaBeacon has been updated to its most current version and that the software has been fully activated to host video content. In the platform’s current configuration, video uploading and streaming are time-consuming and resource-intensive processes that may not be feasible for all event recordings produced by the Theater department. If that is the case, then generating access copies and saving those files to the transfer folder on the NAS may not be feasible, rendering this step unnecessary. However, even if this less-than-ideal scenario continues to be relevant in the near future, content creators should nevertheless generate ‘master’ versions of all event recordings and name the files accordingly. Access copies can always be compressed from ‘masters’ at a later date, once the video hosting capabilities on MediaBeacon have been implemented.

**File Transfer Software**
File transfer software should be purchased and installed on the Theater department’s local computer equipment to protect against any data corruption that might affect video files as they are uploaded to the ‘To Archives’ transfer folder. TreeSize scans performed on the NAS revealed a considerable number of zero-byte video files that could have resulted from data corruption incurred during previous transfers to the server.

The Archives currently uses the file transfer software Teracopy to protect the data integrity of its transferred assets. As this tool has already been successfully incorporated into that department’s workflows, it is recommended that Theater staff adopt the same approach. A Mac-compatible version of the software is currently available for download[^35], and a license can be purchased for installation on any computer Theater contractors use to transfer their video files.

**Selection and Appraisal Criteria for ‘Special Projects’**
The Archives has not yet developed selection and appraisal criteria for born-digital video collections, primarily because it has been unable to collect those materials within its existing

resources. Given the specific requirements and challenges inherent to processing special projects-related video materials, this report includes a set of proposed guidelines for selecting UBS MAP, art documentation and other relevant media for long-term retention within the Archives.

The proposed criteria are intended to alleviate staff time, streamline workflows and inform decision-making processes for the Archives when collecting and processing special projects. These recommendations are intentionally limited in their scope, specially tailored to the media and production elements stored on the UBS backup, and factor the Archives’ current storage and staff constraints into account, highlighting the accession of only the most unique and information-rich materials.

It is somewhat difficult to generalize the characteristics and categories of media elements produced for all special projects, as they tend to be highly individualized. Ideally, the Archives should begin discussions about what asset categories will be most relevant to its collections along with production departments when their work on special projects is still in process. This would allow the department to plan for the storage and staff requirements for acquiring special project materials in advance, and hopefully deter content creators from amassing additional backlogs.

**Final Versions of All Public-Facing Videos**
The Archives should acquire the final (i.e. edited, approved and posted online) videos produced for UBS MAP, Latin American Circle Presents, and *Stamina*. This material is central to the Guggenheim’s mission of “exploring ideas across cultures through dynamic curatorial and educational initiatives” and serves as a valuable resource for researchers, historians, artists and other potential user groups.

As these videos are already accessible on the Museum’s YouTube channel (and embedded on its website) they should not be uploaded to MediaBeacon, which has a finite amount of storage space. Links to these videos may be provided in the finding aid once the collection has been accessioned and processed.

Given the Archives’ storage limitations, neither the footage for these productions nor the draft/rough cut versions for final videos should be ingested into the repository. As they have direct relevance to works in the Museum’s collection, the raw/uncut assets for Latin American Circle and *Stamina* should be handled differently than MAP materials. Recommendations for these assets are outlined in the following section.

**Art-related Documentation**
All uncut, rendered video footage of performances staged in connection with Latin American Circle Presents and Agathe Snow’s *Stamina* should be acquired by the Archives. These assets contain unique and instructive information about art works in the Museum’s collection and are highly valuable for both conservation purposes and curatorial interpretation.
As video footage for *Stamina* exists in the form of both rendered video files and as raw camera files, only the rendered files should be ingested into the repository in order to avoid unnecessary redundancies and to save on storage space.

In addition to rendered, unedited video files, there are several consolidated versions of performance footage. These assets have greater value for re-use and research purposes than the unedited, individual clips and should therefore be prioritized for upload to MediaBeacon.

Footage of artworks accessioned as part of UBS MAP and documentation of the installation of those works are also pertinent to the Museum’s collection and should therefore be considered for ingest into the Archives’ repository. As this footage is rendered but unedited, it is unlikely to be useful as reference or research material; for this reason, it should not be uploaded to the DAMS.

**Interview Footage**

As part of production for UBS MAP, numerous interviews were conducted with curators and artists who participated in the initiative. The footage from these interviews were consolidated and exported as video files for various purposes, including transcription and re-use in MAP web deliverables. Interview exports may in some cases contain fuller, more condensed documentation than individual camera clips that have not been edited together.

Given their pertinence to the Museum’s institutional history and art collection, footage of interviews conducted with Guggenheim curators and collection artists should be prioritized for upload to the DAMS. Interviews conducted with curators from the other institutions that participated in MAP should be further reviewed by the Archives in order to determine whether providing internal access via MediaBeacon is necessary for these materials.

**Raw and B-roll Footage, Graphics & Externally-sourced Media**

There are numerous redundancies across both deliverables and production components, and many of the associated media types do not have long-term and/or significant research values. To save on storage space and processing time, it is recommended that these assets not be included in the accessioned collection.

- ‘Raw’ unedited footage
- B-roll
- Graphics (lower thirds, intros/outros, title cards, etc.)
- Non-UBS/external media clips licensed and used in UBS videos
- Exports for transcription, rough cuts and draft versions

TreeSize identified 3,444 duplicates – the equivalent of 2.0 TB – across all file types contained on the UBS drive backup. Many of these redundancies are video files that contain graphics used in MAP deliverables. Graphics include intros and outros, lower thirds, title cards and animations, were re-used in multiple videos because they pertained to the same footage – for example lower
thirds would be re-used when clips from the same interviews were included in different deliverables.

Considerations

Non-Video File Types
As the scope of this project was focused only on audiovisual assets, the other media contained on the UBS backup were not fully reviewed and have not been not factored into these appraisal recommendations. However, there are undoubtedly materials in other file types that should be appraised as part of the special project collections discussed in this report.

Text-based documents such as closed captions, transcripts, and ‘info’ files (containing titles, descriptions, tags and links) that were created for MAP deliverables contain important contextual information that should be included along with their related video files. Rights-related documents are also necessary for acquisition, as the following section discusses those in greater detail.

In addition, there are numerous audio files on the Glyph 6TB backup that contain original music composed by JP Schlegelmilch for the UBS MAP videos. These assets are also of value and should be considered for acquisition.

Rights-related Information Management
All documentation pertaining to the rights of legacy video productions should be identified, collected, and ingested into the archives repository. Collection of rights-related documentation including filming agreements, release contracts, and copyright statements will be necessary to facilitate re-use and/or accessibility of video materials.

Going forward, rights information should be routinely submitted to the archives along with final videos and other relevant documentation such as transcripts and closed caption files.

Long-term Recommendations

Software
MediaBeacon
Currently, the majority of the Guggenheim’s video content is not accessible on its DAM (MediaBeacon). While the platform does have video hosting and streaming capabilities, they have yet to be fully activated. Doing so would require more processing power to regularly upload video materials, and likely an investment in the plug-in Vantage Telestream for enhanced transcoding and playback.

In the internal interviews conducted for this project, staff frequently mentioned the inconveniences caused by having to facilitate viewing requests and the repercussions brought by the lack of a centralized location from which to source institutional assets.
Without a viable access platform on which to upload their assets, media producers are left to field their own viewing requests, often relying on ad hoc procedures and methods. Scheduling viewings, sourcing the requested materials, and providing on site access has resulted in a loss of productivity for these departments, and placed a strain on their already limited resources.

In addition to internally-produced media assets, time-based media artworks are also largely inaccessible to internal staff beyond the Conservation department. While Conservation does facilitate viewing requests whenever possible, the department is only able to do so on-site. This is a limiting consideration for the majority of museum staff who work at either the Guggenheim’s offices or the Museum itself, as the Conservation building is at a considerable distance from both of those locations. The process involved in facilitating viewings is equally cumbersome, as Conservation staff have to download the requested viewing copy from the art work storage server.

With limited bandwidth and large file sizes, downloads can take a long time to complete; knowing the strain it places on the department’s technical and human bandwidth, museum staff are reticent to request viewings. Not having access to a viable platform for viewing art works hinders the ability of curatorial staff to research and expand their knowledge of the Museum’s permanent collection.

Archivematica
The Archives currently have a local instantiation of Archivematica, also implemented during the 2013-2014 NHPRC grant project. Currently, the Archivist and Pratt Institute Born-Digital Archives Fellow utilize it to accession the backlog and new electronic submissions, generate and save Archival Information Packages (AIPs) in the OAIS digital repository.

Expanding the use of Archivematica through another pipeline for Conservation could streamline Conservation’s workflow by automating many of the processes that staff are currently performing manually, including: transcoding, bagging, validation, file naming, generating reports from Media Info, and extracting metadata. In addition to automating processes that are already in use, Archivematica would also allow the department to incorporate previously un-adopted best practices into their workflows, thereby producing a much stronger record of authentication for the museum’s collection of time-based media art works. Two examples of best practices that the Conservation department is not currently following include virus scanning and generating preservation metadata, namely using the PREMIS metadata schema. These are necessary elements of art conservation workflows that would be too labor-intensive to produce them manually.

Additional Staff Support for Archives
While the contents of the storage media that were backed up during this project are currently held on a secure location on the Museum’s network, the Archives will eventually have to transfer those assets over to its own server for ingest and processing. The appraisal criteria included in this report should help to lessen the amount of content selected for transfer, but the process will
nevertheless be time-consuming. In addition, there are 5 back-ups from the Theater department that were not reviewed for appraisal as part of this project. The Archives should make every effort to secure additional staff support to tackle this project, whether by creating an internship or grant project or hiring additional personnel.

The NDSR resident and project supervisor have already begun the work of advocating for the Museum to create an additional, full-time and permanent staff position to serve as a liaison between A/V production units, Archives, Conservation, and IT departments. Working in close coordination with content creators, the Digital Content Manager would effectively move the preservation workflow upstream by intervening at the beginning of the video production process. In this capacity, the staff member would track, manage, and facilitate the transfer of internally-generated media assets into the Archives much nearer to the creation date than is currently possible.

Resources
This project successfully advanced the Archives’ efforts to establish comprehensive preservation and access frameworks for all digital audiovisual materials. Following the recommendations outlined in this report, progress will undoubtedly continue towards achieving that goal. However, it will not be feasible for the Museum to manage its large and growing digital video collections without allocating greater resources for storage, software and personnel. Building off of the cost models developed during this project, the Archives and IT departments, along with members of the Digital Asset Working Group, should continue to advocate for effective preservation and access systems.

Outcomes and Achievements

Digital Preservation Policy
In the final months of the project, the resident and Manager of Library and Archives organized a cross-departmental meeting to discuss problem areas and potential solutions related to video production and preservation. The Museum’s Chief Financial Officer and representatives of several departments were present at the meeting, including Public Programs, Theater & Production Services, Curatorial and IT, all of whom agreed that drafting a policy would be the most logical first step towards improving other digital preservation activities that would require more funding.

As a result of this discussion, members of the Museum’s senior leadership granted their approval to draft a digital preservation policy. This decision represented a significant accomplishment for the project, but also and more importantly reflects an institutional commitment to advancing digital stewardship at the Museum. Once approved, the policy will serve as a guiding document for implementing a comprehensive and cohesive digital preservation at the Guggenheim and also serve as a foundation for all future related activities. The document will also be made available online along with all of the Museum’s other policies.
At the time of writing this report, a draft of the policy has been written and distributed to numerous departments for review. It is likely that further revisions will need to be made before the policy is submitted to the Board for approval, but the drafting process has already inspired collaboration between multiple stakeholders and aligned incentives, particularly between the Archives, IT, Public Problems, productions and Conservation departments.

In its current state, the digital preservation policy draft positions digital-based collection artworks at its core while also specifying the inclusion of related documentation, institutional assets, and all pertinent born-digital and digitized materials. However, the finalized policy framework should be considered a living document, with the scope of digital assets covered by the policy expected to shift over time as technology changes and the priorities of the organization evolve.

Significant thanks are owed to Emily Rafferty at the Baltimore Museum of Art for offering her guidance on the policy drafting process, as well as Kristen Regina and Karina Wratschko at the Philadelphia Museum of Art for sharing their institution’s digital preservation policy, a useful model for specifically addressing the needs inherent to arts institutions.

Advocacy and Reports
In this final phase of the project, the resident synthesized the findings from their research into a series of internal reports, and also engaged in advocacy-raising activities aimed at both promoting awareness about the need for systematic digital video preservation and access as well as gaining institutional buy-in and support for implementing the project’s recommendations.

Cost Modelling
Using some of the price points that were quoted in the software demos, the resident coordinated with the IT department to compile cost models for software, storage and personnel recommendations that would be later presented to the Museum’s senior-level decision-makers. Joshua Meehan, Associate Director of IT, was a key contributor to this cost-modelling process and provided crucial information about the Museum’s technical infrastructure, including the storage capacity and disk replacement requirements for the Museum’s various servers over time, as well as the amount of IT staff time that would be needed for administering the proposed additional hardware and disaster recovery cloud storage.

Internal Presentations
While simultaneously conducting their ongoing research and analysis, the resident also advocated for systematic digital video preservation and access at the Museum by engaging in a number of internal outreach activities. This included an introductory presentation on the project’s goals that was given to Curatorial staff during one of their monthly department meetings, regularly debriefing members of the Digital Asset Working Group on the resident’s research findings, and pitching recommendations and cost models to representatives of all relevant stakeholder groups.
In this final stage of the project, the resident re-capped a presentation they had given at the AIC annual conference for all staff in the Conservation department and led a final, hour-long talk on their project findings and recommendations that was made open to all museum staff. The resident also presented their short (3-5 years) and long-term (5-10 years) recommendations for storage, software and personnel, along with cost estimates, at a meeting that was attended by various stakeholders, including a representative of the Finance department.

This cross-departmental meeting, which was organized around a discussion of the Museum’s video production and preservation, provided an opportunity for the resident to share their project findings and advocate for systematic digital preservation. While the presentation did not result in an immediate financial investment, it did help to raise awareness, garner institutional buy-in, and incorporate the need for implementing a streamlined preservation and access framework for digital video into long-term planning.

These opportunities helped to build momentum around the project and inspire conversations about the current state of audiovisual preservation and access at the Museum, prompting departments to think through some of the ways their own roles and responsibilities could be adjusted to better support the stewardship of digital media. While advocating for greater resources also factored into this process, the resident found that fostering consistent communication and collaboration between departments was ultimately the best strategy for enacting necessary change. By bringing together staff from different sectors of the museum to share their experiences with video production and preservation – as was the case in numerous Working Group discussions – the project gained additional advocates and aligned incentives between departments that had previously found themselves on opposite ends of the digital asset lifecycle.

Reports
While pursuing their various advocacy-raising efforts, the resident also dedicated the final phase of their project to compiling a series of comprehensive reports that outlined their findings and recommendations and included actionable guidelines to distribute to the project’s primary stakeholders at the conclusion of the residency. The resident submitted one ‘master,’ internal report that detailed all of the information they had gathered through the staff interviews, storage surveys, and external research they had conducted in earlier project phases, and also outlined a set of tiered, cost-effective recommendations to guide the Museum in improving its institution-wide storage and access infrastructures for all digital video assets.

In addition, the resident crafted 3 appended collection assessments focused on the case studies they had explored throughout the project: Theater’s Public Programs recordings, Digital Media’s UBS Map materials, and the object reports stored on the Conservation department’s share drive. While the collection assessments have not been appended to this report, much of their contained workflows for the submission of newly-generated materials to the DAMS and archival repository, as well as guidelines on file naming and organization, are detailed in other sections of the report.
Outreach and Dissemination

NDSR Site Visit

A significant amount of time during the end of the first and through the second project phases (October – January) was dedicated to planning an NDSR Site Visit to New York in collaboration with Rachel Ward, an NDSR Art resident at Small Data Industries in Brooklyn, NY.

A required component of the NDSR program, the Site Visit consisted of various tours, activities and events that both residents organized for the other members of their cohort. In planning this visit, which took place over the course of 3 days in January 2019, the residents’ initial objective was to develop a holistic itinerary that reflected both of their NDSR Art Projects. Diverging from the resident’s exploration of digital preservation and access systems for digital audiovisual media, Rachel Ward’s NDSR project was focused on the ecosystem of contemporary art and the conservation of media-based works. As a way of bridging these two subject matters, the residents developed a theme for the trip based on tracing the life cycle of a time-based media artwork, starting from the point of creation in the artist’s studio, to the acquisition and, ultimately, conservation within its collecting institution.36

While the responsibilities for organizing the visit was split between both residents, the amount of logistical planning required for compiling the itinerary was nevertheless time-consuming. Tali Han was a great help in this respect and contributed much time and effort to putting together a tour of the Guggenheim offices as well as a hands-on workshop focused on integrating information related to art documentation across the Museum’s digital repositories. 37

The Site Visit’s culminating, public-facing event consisted of a panel discussion on “Safeguarding and Activating Digital Video Information in Cultural Institutions” that the resident co-organized with the Metropolitan New York Library Council (METRO) and also moderated. As Rachel Ward took on the responsibility for arranging two days-worth of events for the Visit, including both a tour of the Whitney Museum as well as a studio visit for the artist Cory Arcangel, the resident was charged with distributing a Call for Proposals, selecting abstract submissions, compiling an event schedule, and arranging for both a live stream and static video recording of the METRO panel to be made available on the ARLIS/NA Learning Portal.38 The METRO panel on “Safeguarding and Activating Digital Video Information in Cultural Institutions” was well-attended, with 57 registered attendees and several more on the event’s wait list.

Speaking Engagements

In addition to internal advocacy efforts, the resident also shared their project findings and spoke about their experience participating in the NDSR program in numerous public-facing presentations at conferences, webinars and other professional events. Using their NDSR

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37 See Appendix III for a full itinerary of the residents’ NDSR Site Visit.
38 A recording of the METRO event is available on ARLIS/NA Learning Portal: https://www.pathlms.com/arlisna/events/614/video_presentations/131465
professional development funds and dedicated 20% work time, the resident presented at 7 different conferences in various locations across the Northeast, which provided opportunities to bolster their public-speaking experience, expand their professional network, and also broaden their understanding of the current issues, technologies and topics most relevant to the field of digital video preservation.

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<thead>
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<th>Role</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>Co-presenter</td>
<td>Towards Institutional Access: Promoting Internal Conversations Around the Stewardship of Digital Media</td>
<td>New England Archivists (NEA) Fall 2018 Meeting Boston, MA</td>
<td>October 2018</td>
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<td>Presenter</td>
<td>Surveying Digital Production Workflows in Arts Institutions</td>
<td>VREPS/ARLISNAP Virtual Conference Webinar</td>
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<td>Moderator, Panel Organizer</td>
<td>Safeguarding and Activating Digital Video Information in Cultural Institutions</td>
<td>Metropolitan New York Library Council (METRO) New York, NY</td>
<td>January 2019</td>
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<tr>
<td>Panelist</td>
<td>NDSR Art: Developing Cross-Institutional Digital Preservation Strategies for GLAM Assets</td>
<td>ARLIS/NA Annual Conference Salt Lake City, UT</td>
<td>March 2019</td>
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<tr>
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<td>Digital Collections: Creation, Management, and Development</td>
<td>ARLIS/NA Annual Conference Salt Lake City, UT</td>
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<td>MCN Strategy SIG Call</td>
<td>April 2019</td>
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<td>AIC Annual Conference Uncasville, CT</td>
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<td>Presenter</td>
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<td>NDSR Art Capstone Baltimore, MD</td>
<td>June 2019</td>
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<tr>
<td>Organizer/Moderator</td>
<td>Oral History Strategies and Stewardship</td>
<td>NDSR Webinar</td>
<td>June 2019</td>
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Appendices

Appendix I: Proposed Timeline, Project Phases and Deliverables

The original project proposal submitted to NDSR included a timeline structured around the following 4 iterative phases, each accompanied by its own set of goals and deliverables:39

I. Phase 1 (Months 1-3): Training and Preparation

i. Receive training in and develop familiarity with the Museum’s systems, software, and technical infrastructure, including TMS, ArchivesSpace, and MediaBeacon.

ii. Meet Digital Asset Working Group members.

iii. Prepare for and schedule staff interviews.

iv. Draft and distribute online survey.

II. Phase 2 (Months 4-6): Survey and Research
   i. Survey all storage systems, software and digital repositories with audiovisual files across the institution, focusing on ingest procedures, data integrity and redundancy, and metadata description.
   
   ii. Identify the pros and cons of repositories, systems, and workflows used by other organizations through meetings with relevant specialists.
   
   iii. Conduct staff interviews and follow-ups.
   
   iv. Analyze current video production workflows and categorize asset groups by access needs and limitations.

III. Phase 3 (Months 7-9): Identification and Recommendations
   i. Research appropriate storage solutions and identify improvements to ingest procedures, including data integrity validation and fixity checks.
   
   ii. Identify standardized technical and descriptive metadata to support searchability, access, and long-term preservation.
   
   iii. Propose access software solutions.

IV. Phase 4 (Months 10-12): Testing and Reports
   i. Test recommended ingest, metadata, and access workflows using appropriate software and hardware
   
   ii. Organize findings and proposed solutions and workflows into a white paper.
Appendix II: Sample Interview Questions

I. Introduction
   i. About me and background
   ii. Project Overview:
      • Provide background information on NDSR project;
      • Explain the project’s scope and goals;
      • Review what other departments have been interviewed thus far.
   iii. Goals for Interview:
      • Pin point the department’s current practices in relation to digital audiovisual materials/come away with an understanding of how [x] type of materials fits within the Museum’s wider preservation and access frameworks;
      • Identify access needs and any problem areas that need to be resolved.
   iv. Department’s Relevance to Project

Warm up
Can you start by describing your role and responsibilities at [x] department? Length of employment at the institution, scope of day-to-day work, anything else to note?

How do you interact with other departments within the Guggenheim in terms of digital video [production, preservation, access]?

Access
Does your work of the work of anyone in your department call for the need to access materials produced and/or managed by other departments within the Museum? If so, how do you go about accessing those materials?

Have you encountered any roadblocks when attempting to access internal digital media materials?

Can you think of any positive experiences you’ve had while researching [x materials] at other institutions? What specifically did you like about that platform/system/approach? How would you like to see that reflected at the Guggenheim?

Storage
What do you personally use to store digital video materials – hard drive, department share drives, other?

Can you talk about some of the major challenges you’ve encountered in terms of managing your department’s storage systems? How have these storage-related issues impacted your department’s overall workflow?
If you had to quantify these impact of these issues, how many hours a week would you estimate that you currently dedicate to resolving storage-related problem areas?

Does your department currently use and/or have in its possession any external hard drives? (if so, do you know what’s on them?)

Do you maintain/reference any kind of inventory that details the contents and corresponding storage locations of all your audiovisual files?

**Wrap Up/ Next Steps**

What would you like to see come out of this NDSR project?

Any questions you felt I should have asked, but didn’t?

Can you think of anyone else either in your department or within the Museum in general that might have information relevant to my project?
# Appendix III: NDSR Site Visit Itinerary

## Schedule: NDSR Enrichment Session NYC (Jan 30 - Feb 1)

Organizers: Jean Moylan
Rachel Ward

<table>
<thead>
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<th>Wednesday, January 30</th>
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<td>9:15 - 10:30 am</td>
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**Friday, February 1**

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<tr>
<td>10:00 am - 12:30 pm</td>
<td>Small Data Lab Tour</td>
<td>Small Data Lab Industry City</td>
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<td>12:30 – 2:00 pm</td>
<td>Lunch</td>
<td>Industry City</td>
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<tr>
<td>2:00 – 3:00 pm</td>
<td>Cory Arcangel Studio Tour</td>
<td>Industry City</td>
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<tr>
<td>3:00 – 4:00 pm</td>
<td>Recap and Wrap-Up Group discussion, questions, etc.</td>
<td>Industry City</td>
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<tr>
<td>4:00 pm – on</td>
<td>Evening free</td>
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Appendix IV: “Safeguarding and Activating Digital Video Information in Cultural Institutions” Call for Proposals

In today’s digital media landscape, video has assumed an increasingly central role in supporting both the inner workings and outward-facing activities of many arts institutions. With regular users numbering in the hundreds of millions, video streaming portals like YouTube have particularly incentivized museums to generate content related to their exhibitions, performances, events and lectures. Sharing these videos online offers organizations the chance to reach new potential audiences while also fulfilling their educational directives.

Meanwhile, digital media such as artist interviews and installation videos often serve vital functions within museums, providing staff with the tools they need to properly conserve and display complex artworks. While access to these materials is typically limited, they nevertheless hold great documentary value, at times containing otherwise unpublished information about the artists and artworks represented in museum collections.

Whether intended for public or internal use, both these forms of digital video content represent fundamental components of institutional memory and deserve to be safeguarded for future access. But implementing effective storage and access infrastructures for digital video can prove daunting, especially for museums equipped with limited funding and staff. From navigating issues of copyright to weighing the costs of storage scalability in digital asset management systems, cultural organizations must contend with major challenges as they strive to activate and preserve their digital media.

Hosted by the Metropolitan New York Library Council (METRO) and organized in connection with the National Digital Stewardship Residency for Art Information (NDSR Art), this panel will provide a space for archivists, librarians, digital preservationists, and specialists in the field of audiovisual production to share their experiences working with digital video assets in the context of art museums and other cultural heritage institutions.

Interested participants are invited to submit proposals for case studies, lightning talks, or presentations on any topic they believe to be relevant to discussion, but may consider the following:

- Balancing the technical requirements for audiovisual preservation against institutional needs for low implementation and maintenance costs
- Designing online access environments for digital video content
- Building digital storage and access systems with multi-tiered access restrictions
- Streamlining audiovisual production workflows for newly-generated museum content
- Establishing best practices for appropriate technical and descriptive metadata
- Methods for exerting control over the copying, downloading, and sharing of web-based digital media
Appendix V: Event Announcement

**Safeguarding and Activating Digital Video Information in Cultural Institutions**
Thursday, January 31st 4:00-6:00 p.m.*
Metropolitan New York Library Council (METRO)

In cultural organizations, internally-produced digital video materials often function both as vital information resources and as conduits for public engagement. As key components of institutional memory, these assets undoubtedly deserve to be safeguarded for future access. But implementing effective storage and access infrastructures for digital media can prove challenging, especially for organizations equipped with limited funding and staff.

Co-organized by the Metropolitan New York Library Council (METRO) and the National Digital Stewardship Residency for Art Information (NDSR Art), this panel will bring together specialists from a diverse range of institutional contexts to share their experiences preserving and activating digital video.

NDSR Art is a partnership of the Philadelphia Museum of Art and ARLIS/NA, made possible with generous funding from the Institute of Museum and Library Services (IMLS) via a 2016 Laura Bush 21st-Century Librarian Program grant.

**PANELISTS:**
- Amye McCarther | *Archivist and Media Conservator*; New Museum
- Dave Rice | *Archivist*; CUNY Television
- Ben Fino-Radin | *Founder and Lead Conservator*; Small Data Industries
- Farris Wahbeh | *Benjamin and Irma Weiss Director of Research Resources*; Whitney Museum of American Art

**MODERATOR:**
- Jean Moylan | 2018-19 *National Digital Stewardship Residency for Art Information* fellow; Solomon R. Guggenheim Museum

*Reception to follow, 6:00-7:00 p.m.
Landmark Tavern