

A Guide to Undertaking Small Digitization Projects

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This document is the outcome of a small collaborative digitization project undertaken by New York Art Resources Consortium (NYARC) partners Frick Art Reference Library and Brooklyn Museum from October 2010 to August 2011. This project was made possible due to the generosity of Metropolitan Library Council (METRO) in awarding NYARC a collaborative digitization grant as part of their digitalMETRO New York program. The project, *Documenting the Gilded Age: New York City Exhibitions at the Turn of the 20th Century*, digitized materials from the institutions' collections of rare and ephemeral exhibition catalogs, checklists, and pamphlets of New York City art galleries, social clubs, and artists groups from the late 1870s to early 1920s. This brief guide aims to document some of the issues encountered and strategies undertaken during the course of the project and is intended for the benefit of institutions undertaking similar projects. As well, this guide includes standards, best practices, and other resources that can be consulted prior to digitizing unique cultural heritage materials.

A preliminary word regarding collaborative projects: membership in a consortium or active pursuit of collaborative partners can greatly enhance the feasibility and effectiveness of small digitization projects. Shared expertise, lowered technical costs, greater staffing resources, and collection enhancement are all benefits made possible through collaborative activity. The current environment for cultural heritage institutions is one characterized by the challenge of a simultaneous increase in user expectation of online availability of materials and a decrease, or at best stasis, in staffing and both internal and external funding. Collaboration is a means to initiate projects that may be impossible for any one institution to support or sustain. As with any multi-institutional project, however, these collaborations should be undertaken with a full understanding of the unique demands that may be placed upon each participant's operations.

Most digitization projects can be broken down to three phases: project planning, digitization, and post-digitization accessibility and preservation.

Project Planning

This document presumes that the goals and objectives of a digitization project have already been articulated, to administrators if funded internally or to external agencies if grant funded. Having identified a collection worthy of digitization is simply the first step. Other preliminary activities include:

Environmental scan: Performing an environmental scan of the digitized collections of peer and partner institutions can help identify gaps in the type, scope, or extent of materials previously digitized. At the item level, it can also expose specific materials already available in digital form. Thorough knowledge of existing digital collections can

lead to an expansion or contraction of the scope of your targeted collection; this research can also uncover possible future collaborative opportunities.

Appraisal: Appraising the material within a collection targeted for digitization requires an evaluation of many different characteristics. These include:

Value: Items with specific preservation needs, high use or researcher demand, rarity, unique formats, or that complement the targeted collection can be identified during collection appraisal. For instance, a project digitizing books may discover photos or archival material that provides additional context to the collection's focus. Appraising for value should consist of an examination not just of the collection originally targeted for digitization, but also a consideration of other institutional holdings that may be complementary.

Extent: Many projects will have an understanding of the scope of the targeted collection prior to project planning. Collection extent may, however, have been pre-determined by extrapolation or estimation using a selected sample of materials. The appraisal stage provides the opportunity to gain a better understanding of the true extent of all the materials selected for digitization by determining exact size, page count, or format or physical characteristics that will impact digitization. A detailed knowledge of the extent of a selected collection will be needed when determining project costs, timelines, and even issues as specific as shipping, insurance, or storage space for the digital assets.

Conservation assessment: A preliminary conservation assessment during the project planning stage is necessary to understand both the impact conservation and preservation issues may have upon scanning as well as any issues that scanning may have upon the materials themselves. Enclosures, encapsulation, or other conservation treatments or hosing may prohibit certain scanning methods, which could impact digitization workflows or project costs. Items permanently encapsulated may cause glare and refraction issues for overhead cameras and require flatbed scanning; items with fragile bindings may require cradle use when scanning. Additionally, the conservation assessment can identify marginalia, ephemeral additions, or other item-level collection characteristics that will need to be taken into account when determining scanning technical specifications and instructions.

Copyright: The selected bibliography at the end of this section contains a number of resources for researching copyright issues. Copyright is far too complex and fluid a topic to discuss here; however the resources listed below can provide a starting point for researching the issue. The current trend is moving towards a more aggressive policy regarding the digitization of orphan works or other materials of nebulous copyright status.

Metadata: Simply put, metadata is meaning. It is also elemental to effective information management and supports concepts as diverse as discovery, intelligibility, and preservation. Metadata is frequently broken down into three main categories: descriptive, structural, and administrative, with administrative metadata including technical, preservation, and rights metadata. Descriptive metadata identifies the intellectual content

of a resource. Structural metadata identifies the core components of a complex digital resource. Administrative metadata enables the ongoing management of a digital resource. Some metadata will be auto-generated or can be batch-applied by software and other metadata will be individually created and may require more time and attention than the digitization process itself. Determining the metadata necessary for a digitization project is essential to successful project planning.

Most institutions will have some existing metadata for the materials selected for digitization, be it in a form as structured as MARC21 or as informal as an accession record. Some of this metadata, however, may not be applicable for the digital assets created during the project or, in the case of structural metadata, may no longer accurately describe the characteristics of an item now in a digital format. That migration from physical to digital will itself require additional metadata be created for the proper ongoing management of the digital asset. Also, as metadata is frequently format or institution specific, any existing metadata may need to be “crosswalked” from one metadata schema to another, especially in the case of collaborative digitization projects between institutions with different cataloging methods.

Metadata schemas can also support certain technical functionalities. For instance, the METS scheme includes information regarding the structural detail of a conceptual object (a book, for instance) that, post digitization, is now composed of multiple independent digital objects. Other schema, VRA Core for instance, can be specific to a particular format or, like PREMIS, support ongoing activities such as preservation. Dublin Core is a popular, flexible metadata schema that supports multiple types of information. The key questions to ask when project planning the metadata requirements for a digitization project are: What metadata already exists? What metadata will we need? What metadata will be different (or the same) between the original, physical item and its digital version. What functions will the metadata support or enable? How will it be generated and by whom? And how will it be preserved?

Technical Specifications: Another element in project planning is determining the specifications by which your materials will be digitized. This means determining not just what equipment will be used, but the imaging settings, output files, naming conventions, date formats, metadata (if generated during the digitization process), how to handle blank pages, fold-outs, ephemera, marginalia, and other non-visual details, as well as post-digitization processes like background removal, color conversions, and optical character recognition (OCR).

The technical details of digitization are dependent upon the type of material being digitization. However, there are existing, widely used standards and best practices guidelines available. These documents should be consulted when planning technical specifications.

Workflows and process documents: Project documentation articulates the decisions made during the course of project planning and provide guidance during the digitization process. Project documentation can include workflow charts, technical specifications, procedural documentation, quality assurance checklists, project timelines, tasks and benchmark lists, and other documents that can be referenced once the project has begun. Given the fluid nature of staffing, comprehensive documentation is vital to successful

project execution and completion. Project documentation will evolve and will certainly undergo editing and revision once a project is underway, but should always be in draft form prior to the start of a project.

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Digitization:

Acquisition: Most institutions will already have policies in place for acquiring items from their stacks and on-site or off-site storage facilities. However, institutions should think about the ways their existing process may be impacted by segregation of targeted material. Will materials be available for use while in the digitization workflow? Is special tracking required through an ILS or other collection management database? Are new “out-guides” needed? Where will the items be stored as they go through the pre-digitization preliminary processing by conservation, technical services, or cataloging?

Preliminary Processing:

Conservation: A conservation assessment of materials will need to be done prior to their digitization. Items may need to be put in, or removed from, special enclosures or otherwise stabilized for the digitization process. Also, any existing damage to items prior to digitization should be thoroughly documented. This allows for an accurate comparison to an item’s post-digitization condition – something especially important if materials are being digitized by a third-party off-site.

Technical services: Items may also need to be processed by technical services prior to their introduction into the digitization workflow. Assigning a barcode or call number or other unique identifier may be necessary to allow for the proper tracking of materials through the digitization process.

Cataloging: Additional cataloging, descriptive or administrative, may also be necessary before items are digitized. Additionally, conservation notes or other project-related information may need to be entered into the catalog record of selected materials.

Physical tracking: As mentioned in the technical specifications sections, a requirement for physically tracking materials through the digitization process is that each has a unique identifier. Best practices dictate that unique identifiers (UIDs) have no blank spaces or characters other than an underscore or dash. Other issues to consider are how items will be physically managed during the digitization process. Where will they be stored? Who will shepherd them between departments during preliminary processing? Who will arrange for their transfer off-site, if necessary? Who will resshelf them once the project is completed?

Project manifest: Digitization project managers will need a project manifest that details all the individual items. The project manifest can serve two distinct purposes: it is a place (usually a spreadsheet or database) to record any information that may impact, or be required for, scanning; also, it is a place to record the metadata generated by the scanning process itself (such as file types produced, dpi and bit rate, scanning equipment used, quality assurance information, and post-processing details). The project manifest can also have item descriptive metadata that may need to be delivered to the scanning operator for embedding into the digital objects.

Digitizing in-house: If the digitization is being done in-house, then procedures most likely already exist. As mentioned above, thought needs to be given to the ways your specific digitization project will impact existing workflows, not just for the digitization

department, but also for other departments, such as collections management, conservation, reference, and technical services.

Working with vendors: For institutions without the resources to digitize in-house, working with a third-party digitization vendor will be the best option for having materials digitized. Though it obviously saves on equipment and staff costs, working with vendors poses its own set of challenges to managing a digitization project. Not only are you entrusting your collections to a third-party, but you are assuming a number of tasks – from shipping to contractual negotiations – not applicable to in-house scanning projects. The project details specific to working with vendors can be summarized in three areas:

Vendor evaluation and selection: Smaller digitization projects will probably not need to release a RFP (Request for Proposal). The RFP is a formal announcement specifying the full technical details and expected deliverables of your project and the solicitation of vendor bids. While smaller projects will not need to put out a RFP, they are still best served by researching and evaluating a number of different vendors. When researching vendors, be sure to note any special strengths or drawbacks beyond simply the per-item cost of scanning. Some sample questions to consider when evaluating a vendor:

- Is the vendor located within geographic proximity?
- Does the vendor salesperson or representative work from the same site as the scanning is done?
- Will you be able to communicate with the scanning technician or manager?
- Does the vendor offer conservation, book-binding, or other services that may be necessary for your project?
- What type of equipment is used?
- Has the vendor worked with similar material types?
- Are there equipment or technical restrictions due to item size?
- Can the vendor provide references?
- Beyond imaging, what other post-production services, such as OCR and metadata, can the vendor provide?

Most vendors will offer to digitize a small sample of materials, usually at the full project discount per-item/page price. Institutions may also want to do “test batches” with multiple vendors to help identify strengths and weaknesses, both in vendor imaging and post-production equipment and in workflow and quality assurance. Finally, always ask for references, both from the vendor and also from peer and partner institutions or professional listservs.

Vendor contracts: Vendor contracts need to delineate the technical specifications of the digitization as well as all other details including shipping, insurance, packaging, delivery of digital assets, cost overruns, file outputs, post-processing, metadata, naming conventions (at the file, folder, and directory level), any additional special handling requirements, and quality assurance parameters. It is best to identify an on-site scanning technician as a contact person in addition to the salesperson or representative that is your primary contact. Vendors may have default packaging, shipping, and insurance standards, so it is best to clearly define your expectations regarding the transfer of materials. Most vendors will have insurance, but you will want to clearly define shipping, packaging, and

insurance terms in the contract. Vendors will also provide your digital assets on an external hard-drive or discs, but may charge extra for these services. Lastly, it is best to define a quality assurance routine as well as what actions a vendor will take upon the discovery of unsatisfactory digital scans.

Vendor relations and quality assurance: During the digitization process, you will want to remain in contact with both the vendor salesperson as well as the on-site technician performing or overseeing the scanning. In addition, prior to the start of digitization, you will want to establish a method for performing ongoing quality assurance during the digitization process. This can help identify any errors or issues while the collection is still in the vendor's possession. Vendors can usually email or ftp individual scans or zip files of scans or can mail discs with sample images.

Quality Assurance: Quality assurance is performed to ensure not just the accuracy of the image, but also the accuracy of its non-visual characteristics. Quality assurance is also performed when assessing the physical condition of materials after they have been digitized. You may also want to establish a consistent quality control environment, as display (i.e. computer monitor/screen) can have a significant impact on the appearance of a digital image. The following visual aspects should be analyzed when performing quality control on an image:

- Faithfulness to original
- Focus
- Color accuracy (if a color image)
- Skew or centering
- Rotation or reversal
- Contrast and legibility
- Cropping
- Image corruptions, such as moiré patterns, lines, or other distortions
- Reflection or shadow (illumination uniformity)
- Pixilation
- Correct bit-depth and resolution
- Post-scanning processes such as background removal

Non-visual qualities that can be evaluated include:

- Filename
- File type
- Metadata (embedded or external)
- OCR accuracy
- File-specific qualities (such as PDF default display)

Quality assurance should be well-defined prior to implementation and consistent throughout the life of the project.

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Accessibility and Preservation

There are two important points to make regarding post-digitization activities: digitization is not digital preservation, and digitization is not de facto access enhancement. Digital assets require the same preservation management as physical assets – in fact, due to issues such as bit rot and format obsolescence, digital preservation requires an ongoing responsibility not necessarily required in the preservation of physical assets. Digital assets need constant validation, refreshing, and possibly even migration to new formats. The challenges of digital preservation should not be underestimated. Similarly, the work of integrating digital assets into an institution's current framework for accessibility may require as much effort as the digitization itself. Digital assets may also require additional levels of contextual information, curation, or novel means of presentation to promote their use. The ease of transfer and fluidity of location possible with digital assets can be both a benefit and a challenge. The accessibility of digital material can require unique procedures to support discovery and retrieval.

The implementation of a digital preservation program is far too large a topic to be covered in this guide, but some resources are included in the section bibliography. As well, there are some simple best practices that can be utilized when managing your digital assets after the completion of a project.

Accessibility: A workflow should be developed for incorporating newly digitized assets into current practices for accessibility. How will these new digital assets be integrated into your OPAC or other public-facing retrieval interfaces. You may need to create new bibliographic records to represent these items. If you use a collection management system or even a digital asset management system with a web interface, can these items be seamlessly added to an existing collection? What unique metadata is necessary to support their discovery or retrieval? Are additional access points required? Metadata is only one of the issues which can impact the accessibility of digitized works. Others are:

Derivatives: The management and accessibility of digitized objects includes not just the master images themselves, but potentially multiple generations of derivative copies including thumbnails, access copies, and related digital objects such as structured objects like PDFs and other merged or assembled multi-part files. In some cases, these derivatives may be generated automatically by software or be so ephemeral that their

preservation is not an issues. In other cases, they may be managed with the same workflows and procedures as the preservation masters; and in other cases they may require their own systems and processes. A complete understanding of the need, management, and preservation of derivative files will be necessary.

Exhibition and Curation: A highly-accessed collection is a maintained collection. In other words, use is preservation – an idea all the more important for digital assets, that require a level of preservation maintenance greater than that of physical assets. Most projects will have developed a justification for their project prior to digitization; however, they may be served by reexamining those motivations post-digitization. What story do your digitized works tell? What narratives emerge when viewing the digitized collection in its entirety? What place does this collection have within the context of your institution’s existing collections, either physical or digital, or within your collecting scope in the broader sense?

Simply putting digitized works into an existing catalog or online display may not get them the attention necessary to encourage use. Accessibility means not only the literal, technical ability to retrieve a digital asset, but also the knowledge that these assets exists. Use of newly digitization collections may also provide the administrative mandate for continued or extended digitization planning. Thus, it is recommended that digital projects pursue multiple methods for enhancing the knowledge and use of digital collections. One example is creating an online exhibition. Unique, potentially high-use, or even just colorful, “eye-candy” items can be curated from the digitized items to provide a snapshot view of the collection. For non-visual works, a narrative can be framed using the information found in the documentary evidence that has been digitized. The important fact is that exhibition and curation can provide an additional access point for use of the collection. By providing additional context, both descriptive and historical, through exhibition and curation, you can enhance the use of digital assets.

Promotion & Outreach: Most institutions will have an existing framework for promotion and outreach. Digital project, just like other institutional initiatives, should be integrated into this framework. Like the aforementioned exhibition and curation, blog posts, social media, use in marketing or administrative materials, conference and professional development exposure, journal articles, listserv and society announcements – all can be deployed to promote awareness of newly digitized collections.

Digital Preservation: It is only a matter of time that grant-funding agencies begin to require a “data management” plan as a requirement of grant application. Indeed the National Science Foundation has already instituted such a requirement. It is inevitable that agencies with a cultural heritage focus will eventually follow suit. The results of far too many past digitization projects now sit on compact disc or other fragile and inaccessible physical carriers. As digitization become more integrated with everyday procedures – as it becomes an standard practice of acquisition and accession – digital preservation becomes of increasing concern. Like copyright, digital preservation is far too vast and complex a topic to be explored here. Digital preservation solutions, even more than accessibility, will be institution specific. Some general best practices, though, can be implemented regardless of the level of sophistication of current digital preservation practices.

Duplication: If a digital asset management system (DAMS) is not currently in place, preservation master digital files should be duplicated and stored in multiple locations and on multiple types of media. Having master files only on one thumb drive, or DVD, or server directory, puts that at an exaggerated risk of corruption. One scratch on a DVD can render the entire disc unreadable. Likewise, external drives can fail and single directory folders can be deleted or lost. Duplication is a simple strategy to prevent loss when more long-term preservation systems are being worked out.

Naming conventions and directory structures: As previously mentioned, file naming conventions and consistent directory structures can also support digital preservation practices. File names should be unique and should not contain spaces or any special characters other than underscores or dashes. Similarly, directory structures and folder hierarchies should remain consistent across a department or institutions which will aid in discovery and administration of digital assets after projects are completed. Likewise, policies should be in place for the preservation and maintenance of all project documentation, especially any metadata records, spreadsheets, or documents that will be necessary for the continued management of the digital files.

Checksums: Checksums, or hashtags, are a relatively easy way to verify the ongoing authenticity of digital assets over time. Many DAMS will have checksum validation build into their routine operations, but even for institutions without DAMS, there are simple, open-source systems that can create and validate checksums for digital files.

Preservation Planning: The key element of digital preservation is the understanding that digitization projects are not over once the scanning is completed. The assets created during these projects will require ongoing management. They may require refreshing or migration to a new file format. Multiple sets of derivatives may be generated and may (or may not) require their own preservation actions. Bit rot, format obsolescence, and corruption will be constant threats. Similarly, the metadata needed to manage, retrieve, and understand these files may not always remain with the asset and may require its own preservation procedures. Digital objects are not just “copies” of their physical versions. They are their own unique objects that require their own distinct set of management, accessibility, and preservation functions.

Accessibility and Preservation Selected Bibliography:

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