Digital Media Guidelines and Resources

MANAGING DIGITAL ASSETS

In a general sense, managing digital assets can be as simple as implementing a system for naming and structuring folders and files using conventions that make sense for you. A key concept of managing digital assets is findability: if you can't find a file it is of no use to you.

Resources

- de Gyor, Henrik. Another DAM Blog. http://anotherdamblog.com/
- Howe, Deborah. Manage Your Photos with Adobe's Bridge and Lightroom. Preservation Services, Dartmouth College. 8 Oct. 2013. http://dartmouthpreservation.blogspot.com/2013/10/manage-your-photos-with-adobes-bridge.html
- NYC Digital Asset Managers Meetup. http://www.meetup.com/NYCDigitalAssetManagers/
- Sarwan, Naresh. "Review of Available Open source DAM Software." 7 Aug. 2014. http://www.opensourcedigitalassetmanagement.org/

DIGITAL PRESERVATION

Digital material can be changed or lost for a variety of reasons including ongoing edits, compression, migration, corruption, wear and tear to media storage or unforeseen disasters. Additionally, software and hardware are constantly evolving. Their obsolescence is inevitable and should be accounted for in any digital preservation plan.

The importance of digital preservation for the artist:

- Artists, galleries and museums often spend valuable time and resources digitizing artworks
- Artworks are often stored in warehouses that are difficult to access or they are sold to collectors
- Digital reproductions are often useful in restoration and/or conservation efforts
- Digital reproductions can be substituted for an original work for exhibition (e.g., audio, video, etc.)
- Any handling of artwork--no matter how fastidious--contributes to the deterioration of the object

Resources

- Ashenfelder, Mike Et al. "Perspectives on Personal Digital Archiving National Digital Information Infrastructure and Preservation Program Library of Congress." Library of Congress, 2013. http://www.digitalpreservation.gov/documents/ebookpdf_march18.pdf
- Desaive, Pierre-Yves. Lies Van de Cappelle and Rony Vissers. "Guidelines for an A-Z Digitisation Workflow for Contemporary Artworks." Digitization of Contemporary Art. 4 Jul. 2013. http://www.dcaproject.eu/images/uploads/varia/DCA_D4_2__Guidelines_for_an_A_Z_digitisation_workflow_for_contemporary_artworks_V1.pdf
- Fino-Radin, Ben. Born-Digital Preservation in the Rhizome ArtBase. Rhizome at The New Museum. 2001. http://media.rhizome.org/artbase/documents/Digital-Preservation-Practices-and-the-Rhizome-ArtBase.pdf
- IASA Technical Committee, Guidelines on the Production and Preservation of Digital Audio Objects, ed. by Kevin Bradley. Second edition 2009. (= Standards, Recommended Practices and Strategies, IASA-TC 04). www.iasa-web.org/tc04/audio-preservation
- Library of Congress. Digital Preservation Video Series. http://digitalpreservation.gov/multimedia/videos.html
- Library of Congress. Conversations about Digital Preservation. http://www.loc.gov/podcasts/digitalpreservation/
- Library of Congress. Personal Archiving: Preserving Your Digital Memories. http://www.digitalpreservation.gov/personalarchiving/
- Library of Congress. "The NDSA Levels of Digital Preservation." National Digital Stewardship Alliance. 2013. http://www.digitalpreservation.gov/ndsa/activities/levels.html
- Still Image Working Group, Audio-Visual Working Group. Federal Agencies Digitization Guidelines Initiative. http://www.digitizationguidelines.gov/

PRESERVATION FILE FORMATS / FILE TYPES

Recommended properties for file formats

(Excerpted from Guidelines for a Long-term Preservation Strategy for Digital Reproductions and Metadata. Digitization of Contemporary Art)

- Ubiquitous: The file format should be widespread, often used and well known.
- Open standards: An acclaimed standard with available technical specifications.
- No patents: Formats without patented technology or licenses are preferred.

- Metadata: The possibility of embedding unique identifiers and other metadata within the file.
- Multiple viewpaths/Support: There should be more than one type of software for visualising or rendering the file format.
- Uncompressed formats: For preservation of all data, the use of uncompressed file formats is preferred, in order to keep the best possible quality. Depending on loss, use and quantity, lossless compressed form can be an option.
- Stable: No major or constant changes and also possible backwards compatibility with older versions.

File Types

In its guide to Preserving Your Digital Possessions, The Library of Congress recommends preserving uncompressed originals and working with copies. Once a file is compressed, pixels are removed and it cannot be restored to its original quality.

The guide produced by Digitising Contemporary Art (a project that digitizes contemporary art objects from 12 European countries and publishes on the Europeana website) recommends creating an archival master file (or files), a production master file (or files) and a derivative file (or files). The archival file should be the preserved file used only to produce the production master file. The production master file can be color corrected and edited. From the production master copy, derivatives can be made for various purposes.

Recommended file formats for digital long-term preservation excerpted from the Library of Congress (LOC) and *Guidelines for a Long-term Preservation Strategy for Digital Reproductions and Metadata* by Sofie Laier Henriksen, Wiel Seuskens & Gaby Wijers (H,S,W)

	Text	**Still images, documents**	**Video**
H,S,W	o PDF/A[1] o SGML[2] o ASCII o ODF[3]	o TIFF4] o PNG5] o JPEG2000[6]	o MXF[7] o AVI8] o MOV o Mjpeg2000 / MJPEG2000[9]
LOC	Formats, in order of preference: o XML-based markup formats, with included or accessible DTD/schema, XSD/XSL presentation stylesheet(s), and explicitly stated character encoding • BITS-compliant (NLM Book DTD) • EPUB-compliant • Other widely-used book (DTD/schemas (e.g., TEI, DocBook, etc) o Page-layout formats • PDF/UA (ISO 14289-1-compliant) • PDF/A (ISO 19005-compliant) • PDF (highest quality available, with features such as searchable text, embedded fonts, lossless compression, high resolution images, device-independent specifications of colorspace, content tagging; includes document formats such as PDF/X)	Formats, in order of preference: o TIFF (uncompressed) o JPEG2000 (lossless (*.jp2) o PNG (*.png) o JPEG/JFIF (*.jpg) o Digital Negative DNG (*.dng) o JPEG2000 (lossy) (*.jp2) o TIFF (compressed) o BMP (*.bmp) o GIF (*.gif)	Video -- File-Based o Final production version of content rather than pre-production version o Original production resolution and frame rate (i.e. 1080p24; 720p60, etc.) o Version and file-based format that was delivered to the content distributor Theatrically Released Films o Complete final production/release version of motion picture work in the original production resolution, aspect ratio and frame rate o Theatrical release version in original gauge (e.g., 70mm, 35mm, 16mm) o Unencrypted interop Digital Cinema Package (DCP), when theatrical release is not distributed as film

[1] ISO/IEC19005-1 (2005). Document management – Electronic document file format for long-term preservation – Part 1: Use of PDF 1.4 (PDF/A-1).

[2] Digitaal Erfgoed Nederland, www.den.nl/standaard/6/Standard-Generalized-Markup-Language

[3] ISO/IEC 26300:2006. Information technology, Open Document Format for Office Applications (Open Document) v1.0

[4] Having an uncompressed file means that all the data in the video or still images are intact. This means that the file contains the richest data possible. This richness offers a broad range of possibilities for manipulating the information, like adjusting colour balance and so forth during the editing process. For example, when taking uncompressed photographs with a professional Canon camera the resulting files could be stored in the RAW format. This is a file format that cannot be stored as a viewable file; it can only be used for editing. To preserve the information completely intact, it is recommended to convert this RAW file into an uncompressed TIFF file. This means that the data is not compressed when the file is stored (and t there is no loss of data on colour, brightness etc., due to certain forms of compression). Thanks to this the TIFF file still holds a broad range of editing possibilities. Henriksen, Seuskens, Wijers, Guidelines for a Long-term Preservation Strategy for Digital Reproductions and Metadata

[5] Adler et al. (2003). ISO/IEC 15948:2003 (E), edited by David Duce: Oxford Brookes university, W3C.

[6] ISO/IEC 15444-12 (2005). Information Technology – JPEG 2000 image coding system – Part 12: ISO base media file format. 94p

[7] P. Ferreira (2010). MXF – A technical overview. EBU Technical review (Online). P . http://tech.ebu.ch/docs/techreview/trev_2010-Q3_MXF-2.pdf

[8] Bastijns, P., Coppens, S., Corneillie, S., Hochstenbach, P., Mannens, E., van Melle, A. (2009). BOM – Vlaanderen (Meta)datastandaarden voor digitale archieven. Universiteitsbiltiotheek Gent. P.71-177.

[9] ISO/IEC 15444-3 (2007). Additional profiles for archiving applications

Resources

- Arms, Caroline and Carl Fleischhauer. “Digital Formats: Factors for Sustainability, Functionality, and Quality.” Office of Strategic Initiatives, Library of Congress. 29 April. 2005. http://memory.loc.gov/ammem/techdocs/digform/Formats_IST05_paper.pdf
- Ashenfelder, Mike. Preserving your digital possessions. Library of Congress. 24 April. 2013. http://downloads.alcts.ala.org/ce/04242013_personal_digital_archiving.pdf
- Brown, A. Digital Preservation Guidance Note: 1-Selecting file formats for long-term preservation. National Archives – UK (Online). 10p. http://www.nationalarchives.gov.uk/documents/selecting-file-formats.pdf
- Desaive, Pierre-Yves. Lies Van de Cappelle and Rony Vissers. “Guidelines for an A-Z Digitisation Workflow for Contemporary Artworks.” Digitization of Contemporary Art. 4 Jul. 2013. http://www.dcaproject.eu/images/uploads/varia/DCA_D4_2__Guidelines_for_an_A_Z_digitisation_workflow_for_contemporary_artworks_V1.pdf
- Henriksen, Seuskens, Wijers, Guidelines for a Long-term Preservation Strategy for Digital Reproductions and Metadata. Digitization of Contemporary Art. 13 Feb. 2012. http://www.dca-project.eu/images/uploads/news_activities/DCA_D61_Guidelines_Long_Term_Preservation_Strategy_20120213_V1.pdf
- Library of Congress Recommended Format Specifications. (n.d.). Retrieved from http://www.loc.gov/preservation/resources/rfs/TOC.html
- Library of Congress. Sustainability of Digital Formats Planning for Library of Congress Collections. (n.d.). http://www.digitalpreservation.gov/formats/sustain/sustain.shtml

FILE NAMING

- Implement a clearly defined system
- File names must be unique
- Avoid spaces and special characters like punctuation marks, hyphens, brackets, etc. Use only the letters of the Latin alphabet, the numericals 0 to 9, or a combination of both. Underscores are acceptable and may take the place of spaces
- Can be descriptive (reference the content, title, or identification number of the file) or non-descriptive: Meaningful file names can help with identification. However, they may interfere with a larger digitisation workflow

Resources

- Desaive, Pierre-Yves. Lies Van de Cappelle and Rony Vissers. “Guidelines for an A-Z Digitisation Workflow for Contemporary Artworks.” Digitization of Contemporary Art. 4 Jul. 2013. http://www.dcaproject.eu/images/uploads/varia/DCA_D4_2__Guidelines_for_an_A_Z_digitisation_workflow_for_contemporary_artworks_V1.pdf
- Jisc Digital Media, “Choosing a File Name.” http://www.jiscdigitalmedia.ac.uk/guide/choosing-a-file-name/

METADATA

Embedded metadata is considered best practices when it comes to long-term preservation since descriptive information about the file and file contents is directly attached to the file. The metadata will remain with the file regardless of obsolescence or changes in software.

“Tagging” digital files with information relating to subject matter and location and adding descriptive details within the file itself is a basic form of embedded metadata. This can be done by simply selecting “Get Info” for a file by right-clicking or control-clicking a file. Typically, Digital cameras will automatically embed information including the date the photo was taken within the Exchangeable Image File Format (EXIF) metadata field. A variety of photo editing tools can assist in embedding metadata in a more extensive manner including applying specified metadata in batches.

Be aware that some photo editing and photo managing software does not store descriptive information with the file but within a separate database. Additionally, if photos are removed from social media or online photo-sharing sites, any tagging, captions and other descriptive information will likely be separated from the file. Some social media sites even strip away existing embedded metadata.

Resources

- Ashenfelder, Mike. “Social Media Networks Stripping Data from Your Digital Photos.” The Signal. Digital Preservation. Libray of Congress.11 April. 2013. http://blogs.loc.gov/digitalpreservation/2013/04/social-media-networks-stripping-data-from-your-digital-photos/
- Coppens, Sam and Erik Mannens. “Metadata Implementation Guidelines for Digitised Contemporary Artworks.” Digitization of Contemporary Art. http://www.dca-project.eu/images/uploads/news_activities/DCA_D31_Metadata_Implementation_Guidelines_20120120_V1_1.pdf
- J. Paul Getty Trust. Metadata Standards Crosswalk http://getty.edu/research/publications/electronic_publications/intrometadata/crosswalks.html
- Library of Congress. PREMIS Data Dictionary for Digital Preservation Metadata. Version 2.2, July 2012. http://www.loc.gov/standards/premis/v2/premis-2-2.pdf p. 5-21 [PDF p. 12-28]
- Photographer’s Toolbox. “LR/Transporter.” http://www.photographers-toolbox.com/products/lrtransporter.php
- Visual Resources Association. Cataloging, Metadata, and Data Management http://vraweb.org/resources/cataloging-metadata-and-data-management/

» Walsh, Mureen P. “Automated reuse of embedded image metadata for the Knowledge Bank.” The Ohio State University Libraries. 27 FEB. 2013. https://library.osu.edu/blogs/digitalscholarship/2013/02/27/automated-reuse-of-embedded-image-metadata-for-the-knowledge-bank/

CONTROLLED VOCABULARIES / CATALOGUING

“The purpose of controlled vocabularies is to organize information and to provide terminology to catalog and retrieve information. While capturing the richness of variant terms, controlled vocabularies also promote consistency in preferred terms and the assignment of the same terms to similar content.”

- Harpring, Patricia. Murtha Baca, Series Editor. “What Are Controlled Vocabularies?”
from Introduction to Controlled Vocabularies: Terminology for Art, Architecture, and Other Cultural Works

Resources

» Ashenfelder, Mike Et al. “Perspectives on Personal Digital Archiving National Digital Information Infrastructure and Preservation Program Library of Congress.” Library of Congress, 2013. http://www.digitalpreservation.gov/documents/ebookpdf_march18.pdf

» Harpring, Patricia. Murtha Baca. Series Editor. “What Are Controlled Vocabularies?” from Introduction to Controlled Vocabularies: Terminology for Art, Architecture, and Other Cultural Works. Online Edition. www.getty.edu in 2010 by the Getty Research Institute, Los Angeles. http://www.getty.edu/research/publications/electronic_publications/intro_controlled_vocab/what.pdf

» J. Paul Getty Trust. Art & Architecture Thesaurus. [Online] http://www.getty.edu/research/tools/vocabularies/aat/about.html

» J. Paul Getty Trust. Categories for the Description of Works of Art. http://getty.edu/research/publications/electronic_publications/cdwa/index.html

» Visual Resources Association Foundation. “Cataloging Cultural Objects: A Guide to Describing Cultural Works and Their Images.” Online Edition. The CCO Commons http://cco.vrafoundation.org/index.php/toolkit/cco_pdf_version/

PRESERVATION STORAGE

Storage Guidelines (Excerpted from: “Library of Congress: Preserving Your Digital Possessions”)

» Each digital storage medium has vulnerabilities and a limited lifespan. There is no 100% safe medium

» Each digital storage medium becomes obsolete as technology Improves. The danger is that your stuff could get trapped on obsolete media. It’s easy to lose track of your digital stuff, scattered on CDs, websites, floppies, thumb drives and buried in your computer.

» Email, social media, cloud storage and other online services can go out of business or could get hacked.

» Move your collection to a current storage medium once every five to seven years or replace frequently used storage devices. Copy the folder to at least two different types of storage devices.

» The professional photographer’s 3 - 2 - 1 rule: Make 3 copies, Save at least 2 onto different types of storage media, Save 1 in a different location from where you live

» When planning your estate, let a loved one know where you store your important documents. Supply passwords, if needed. If you rename the file with a descriptive name it can help you identify the photo without displaying it. Some photo editing software will enable you to add a description into the photo file just as you would write a description on the back of a paper photo. With some photo-editing and photo-managing software, after you enter descriptions to the photo, those descriptions remain in a database linked to your photos.

» If you add descriptions to photo files, uploading your photos to social media sites and photo sites -- and as email attachments -- may wipe out your descriptions.

Storage Types

CD

DVD

USB Flash Drive

Magnetic tape

Hard disk drive

Solid state storage

Network-attached storage (NAS)

Storage area network (SAN)

Cloud Storage:

Amazon Cloud

Dropbox

Amazon S3 (Simple Storage Service)

OpenStack

DuraCloud

The type and method of storage depends on a number of factors including budget, file size, expertise and existing storage media solutions. There is no one correct method. The excerpts below offer some insight into best practices for varying storage types from leaders in the field:

> "Optical media is also not dead. Ken Wood from Hitachi pointed out that 30-year-old commercial audio CDs are still supported in the hardware marketplace, and that CDs still play. Technically that has just as much to do with the software interface with error correction still being in play as the hardware still being supported. But mechanical compact disc players and storage are disappearing with the rise of mobile devices and thin laptops which have no optical players or hard discs."
>
> *-The Signal, Digital Preservation. Planning for Preservation Storage*
> *October 30, 2013 by Leslie Johnston*

> "Currently, we use CD-ROMs for distribution of images to external sources, not as a long-term storage medium. However, if images are stored on CD-ROMs, we recommend using high quality or "archival" quality CD-Rs (such as Mitsui Gold Archive CD-Rs). The term "archival" indicates the materials used to manufacture the CD-R (usually the dye layer where the data is recording, a protective gold layer to prevent pollutants from attacking the dye, or a physically durable top-coat to protect the surface of the disk) are reasonably stable and have good durability, but this will not guarantee the longevity of the media itself. All disks need to be stored and handled properly. We have found files stored on brand name CD-Rs that we have not been able to open less than a year after they have been written to the media. We recommend not using inexpensive or non-brand name CD-Rs, because generally they will be less stable, less durable, and more prone to recording problems."
>
> *- Steven Puglia, Jeffrey Reed, and Erin Rhodes. U.S. National Archives and Records Administration (NARA)*

> *From the Panel on "The Cloud" at the Designing Storage Architectures for Digital Collections meeting hosted by the Library of Congress, 2013:*
>
> "Clouds are nice but sometimes it rains."
>
> *- Andy Maltz of the Academy of Motion Picture Arts and Sciences*

> "I have conversations with people who say 'It's in the cloud.' And where is that, I ask. The cloud is still on physical servers somewhere."
>
> *- Fenella France at the Library of Congress*

> "When is the cloud better than doing it yourself? When you have spiky demand and not steady use; The use of the cloud is the 'Drug Dealer's algorithm': The first one is free, and it becomes hard to leave because of the download/exit/migration charges; The cloud is not a technology, it's a business model. The technology is something you can use yourself."
>
> *- David Rosenthal of Stanford University paraphrased by Leslie Johnston in The Signal blog post Planning for Preservation Storage. October 30, 2013*

Resources

- The State Library of North Carolina Department of Cultural Resources. “Storage Media.” https://www.youtube.com/watch?v=kOsqBdtV0Xc&list=UUC-ClbdzAy9XFi1pJem1FSQ&feature=share&index=2
- Ashenfelder, Mike Et al. “Perspectives on Personal Digital Archiving National Digital Information Infrastructure and Preservation Program Library of Congress.” Library of Congress, 2013. http://www.digitalpreservation.gov/documents/ebookpdf_march18.pdf
- Johnston, Leslie. “Planning for Preservation Storage”. The Signal: Digital Preservation. Library of Congress. 30 Oct. 2013. http://blogs.loc.gov/digitalpreservation/2013/10/planning-for-preservation-storage/
- Library of Congress. “How Long Will Digital Storage Media Last?” Digital Preservation. http://www.digitalpreservation.gov/personalarchiving/documents/media_durability.pdf
- Ashenfelder, Mike. Preserving your digital possessions. Library of Congress. 24 April. 2013. http://downloads.alcts.ala.org/ce/04242013_personal_digital_archiving.pdf
- Federal Agencies Digitization Initiative (FADGI) - Still Image Working Group. “Technical Guidelines for Digitizing Cultural Heritage Materials: Creation of Raster Image Master Files.” 24 Aug. 2010. http://www.digitizationguidelines.gov/guidelines/FADGI_Still_Image-Tech_Guidelines_2010-08-24.pdf

IN-DEPTH GUIDELINES FOR DIGITIZATION PROCESSES

Resources

- Desaive, Pierre-Yves, Lies Van de Cappelle and Rony Vissers. Guidelines for an A-Z digitisation workflow for contemporary artworks. http://www.dca-project.eu/images/uploads/varia/DCA_D4_2__Guidelines_for_an_A_Z_digitisation_workflow_for_contemporary_artworks_V1.pdf
- Federal Agencies Digitization Initiative (FADGI) - Still Image Working Group. “Technical Guidelines for Digitizing Cultural Heritage Materials: Creation of Raster Image Master Files.” 24 Aug. 2010. http://www.digitizationguidelines.gov/guidelines/FADGI_Still_Image-Tech_Guidelines_2010-08-24.pdf

DATABASES

The highest quality commercially available database software designed for collections or inventory management is intended for museums or other collecting institutions. The cost of software or subscription based services can be prohibitive for artists. Many artists and artist studios design their own solutions or hire a developer to create a custom-made database using FileMaker Pro, Access or AppleWorks. Some museums and other institutions create their own open-source solutions, some of which might be useful to artists. Open-source solutions are available at no cost in themselves but involve setup, configuration and maintenance that may require substantial resources.

Considerations for selecting a database

- Can you extract your data easily? Many collections management databases can produce reports or export to Excel or XML, but is a system-wide export possible? Software will become obsolete without perpetual updates, a vendor can go out of business, or you may find a solution you like better. Countless hours might be applied to entering data into a database; you should be able to get your content out.
- Does the database support your work style? For example, some databases don’t allow a user to open a second window. This can be very disruptive if you need to compare two or more records or want to preserve a found set while performing a second search.
- What is the potential for sharing or mobile access? If a database is not designed for these purposes, moving it from device to device can result in loss of data and corruption.
- What kind of support exists? Be sure that you and/or an assistant have the expertise to operate the system. Is there someone you can contact or other resources available if you run into a problem?
- Do you need a solution that is compliant with international cataloguing standards? Can you input your own controlled vocabularies into value lists? This functionality can greatly effect findability and consistency across data.
- How are images and other documents stored? Sometimes images and documents are stored within the file itself which can lead to a very large database file that slows processing speed and takes up storage. Sometimes images and documents are stored as references only. If either the database or the file is moved, the filepath becomes irrelevant and the file will be lost from the record.
- Selecting a database might ultimately come down to cost. Creating a simple solution in Excel, Access or FileMaker Pro according to conventions you define and understand might be better than investing in a pre-packaged low-cost, commercial solution with limited functionality and a lack of transparency.
- Is the solution recommended by colleagues? What has worked for other artists working in similar media? Selecting a database is a common subject on listservs for collecting institutions which often have major budgetary constraints. Museum professionals often offer their experiences and recommendations on the RC-AAM (Registrar’s Committee of the American Association of Museums)’s listserv, for example.

Resources

- Collection Space. http://www.collectionspace.org/
- Gendron, Heather and Eumie Imm-Stroukoff. “Studio Archives: Voices of Living Artists, Their Assistants, and Their Archivists.” From ARTISTS’ RECORDS in the ARCHIVES: Symposium Proceedings October 11-12, 2011 at the New York Public Library and Fashion Institute of Techonology Sponsored by the Archivists Round Table of Metropolitan New York, Inc. http://www.nycarchivists.org/resources/Documents/ArtistsRecordsSymposiumProceedings.pdf
- Registrar’s Committee of the American Association of Museums http://www.rcaam.org/Listserv