GUIDE TO QUALITY CONTROL AND QUALITY CHECKLISTS

WHAT IS QUALITY CONTROL?

Digitization can be costly, take time, and can mean extensive handling of original materials, which may be fragile. For these reasons the goal of any digitization project should be to create high-quality master images, audio, or video files from which many derivative images can be created for access and other uses. Quality control (QC) is an important part of any digitization project. QC includes procedures and techniques to verify the quality, accuracy, and consistency of digital files. Quality control should be conducted throughout all phases of the digital conversion process to ensure that the material is only digitized once, decreasing the need to handle and move the material.

WHO IS RESPONSIBLE FOR QUALITY CONTROL?

In many workflows, QC is performed in a two-step process: the person doing the conversion or digitizing will perform and document an initial quality check during the digitization process, and then a different individual will perform a second review in a separate process. If a vendor is conducting the digitization, this process will be different, but still involve multiple stages of quality control.

WHAT ELEMENTS ARE YOU CHECKING IN QUALITY CONTROL?

Before you start a digitization project, you must determine the technical specifications to use for your electronic documents in order to ensure their quality is preserved for the long term. An example of technical specification for an image digitization project are: resolution, image mode, sample and bit rate, file format and storage medium. This is the information that you will compare when you do quality control work. You should also clearly define the specific defects that you find unacceptable in a digital file, so you and your staff know when a file needs to be re-digitized. If checking file fixity during quality control, you must decide on what method will be used to create and verify checksums.

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How Many Files Should be Verified Per Batch?

In your workflow, you must decide on how many files you will work with at a time or What batches you will digitize in. This could be simply decided by collections, or the number of files could be further divided into smaller batches based on ease of workflow. Depending on your project, you may want to inspect 100% of the master images or 10% of the files randomly. This must be decided at the outset, and followed through the entirety of the project.

How Often Does Quality Control Occur? Daily, Weekly, Monthly?

For each phase of the QC process, the timing of the quality control work should be consistent. Whether it happens at the end of the week or month, or during transfer to a server for preservation, the workflow should be thoroughly documented and followed.

Building QC Into Your Workflow

Consider the Goals of the Project

The first step is to define the goals of the project as the quality control criteria will depend on them. For example, if the goal is to create a faithful reproduction of the original, the digital files should look/sound as close as possible to the original material. You may have different criteria for master, access, and derivative copies as preservation and presentation might require different characteristics. For example, copies of photographs to be printed in the Tribal newspaper will have lower quality specifications than a preservation copy.

Control the QC Environment

Make sure that you are performing quality control in a suitable environment. Given an improper environment, even a high-quality image may come across as unsatisfactory. Factors that may affect onscreen image quality include viewing conditions, monitor calibration, and color management. For audio, factors may include headphones, speakers, or soundcard that the listener is using.

Develop a Consistent Approach

To measure quality and judge whether the products are satisfactory, clearly define baseline characteristics for "acceptable" and "unacceptable" digital products.

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Document QC Workflow and Results of QC

Including QC directly in all stages of your workflow, and making sure this workflow is documented in a manual or other form, is essential for establishing consistency across projects. The quality control process must be documented and maintained throughout the digitization conversion process. Information to document includes problem resolution procedures and reporting requirements for each step of a conversion project. When performing QC, the detailed information should be noted in a QC document (spreadsheet, list, form) and then, if using a digitization tracking spreadsheet, in this as well.

SUGGESTED STEPS IN A QUALITY CONTROL WORKFLOW

Ongoing QC

Some steps in Quality Control should occur regularly, depending on the overall project. These might fall outside of the day-to-day workflow, but should still be performed consistently. You ongoing QC should be applied to any project in which digital files are being created or processed.

Equipment and Software for QC

All analog devices will be cleaned according to manufacturer specifications before beginning the project. Then, according to the manufacturer recommended intervals based on "playing time." Computer hardware and software should also be regularly checked activities – monitor calibration, software updates, and virus checks should be a regular part of the process.

Comparison to Original Analog Material

The first file converted (original digital file and derivatives) of every material type should be compared against the analog master to ensure the specification identified in the project plan. The goal is to produce a file of high enough quality to faithfully render the content moving forward.

First QC Check

The personnel primarily responsible for the conversion should be responsible for the first quality control (QC) check, going through the list of decided-upon items in the Quality Review Checklist after conversion of each batch of content. Depending on the project, this may involve checking as individual files are created, or a sampling of files.

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Second QC Check

A second QC check should be done by other project personnel on a weekly basis. This check will consist of ensuring that the digital file faithfully represents the analog master but also is being given appropriate metadata and stored (and backed up) to the appropriate file locations. As with the First QC Check, it is important to go through a list of decided-upon items in the Quality Review Checklist (may be different/expanded from the First QC Check) after conversion or transfer of each batch of content. Fixity checks may also be a part of this QC check, if not performed separately.

IMAGE QUALITY REVIEW CHECKLIST

File Management and Storage

- Verify that preservation, access, and derivative copies are present.
- Make sure the file names adhere to file naming convention, and correspond with content.
- Make sure the organization of files adheres to directory structure.
- Check that file size and count is as expected.
- If you see a problem with one file, check the surrounding files.
- Create checksums for newly created files.

Technical Specifications

Check that technical information matches with standards for the project (file format, bit depth, color mode, pixels per inch), for both preservation master and access copies.

Visual Inspection

- Images should be inspected while viewing at a 1:1 pixel ratio or at 100% magnification or higher.
- Check that the image is not rotated or backwards (that has the proper reading orientation).
- Check that image is not skewed or off-centered.
- Check that image has clean edges, clear contrast, and legible text.
- Check that image has no broken figures (illustrations, maps, etc.).
- Check that image has no moiré patterns (wavy lines or swirls, usually found in areas where there are repeated patterns).
- Check that image has no unwanted materials (sticky notes, paper clips, dust,
- rubber bands etc.) included in the scan.

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- Check that image has no presence of digital artifacts (such as very regular, straight lines across picture).
- Check that image has no pixelation.
- Check that image is not too light or too dark.
- Check that image has no loss of detail in highlight or shadows.
- Check that master digital image is a faithful representation of the original (if that is the goal).
- If available, use targets or histograms to check images against originals.
- For text:
    - No errors in OCR.
    - Check page completeness, check for text that is cut off, including page numbers.
    - Check contrast, legibility, text density, character size, line widths, and letter clarity.

Metadata

- Check that metadata exists and is stored in the correct format and location.
- Check that content of metadata is accurate, complete, and valid.
    - Check file name and accuracy of descriptions as you do your inspection.
    - Check spelling and grammar.
    - Spot check subject designations and narrative descriptions against actual content.

Fixity Check

- At transfer and at decided rate (monthly, quarterly, etc.) for previously transferred files.

AUDIO QUALITY REVIEW CHECKLIST

File Management and Storage

- Verify preservation, access, and derivative copies are present.
- Make sure the file names adhere to file naming convention, and correspond with content.
- Make sure the organization of files adheres to directory structure.
- Check that file size is as expected.
- If you see a problem with one file, check the surrounding files.
- Create checksums for newly created files.

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Technical Specifications

- Check that technical information matches with standards for the project (file format, bit depth, sample rate, bit rate for access copy).
  - Preservation Master: WAV – 24bit, 96 kHz
  - Access file: MP3, 128 Kbps minimum.

Audio Specifications

- Listen to 30 minutes at the beginning, middle, and end of the recording.
  - Check that file plays and is complete.
  - Check for anything that might have been introduced during digitization (and that is not inherent to original recording).
  - Make sure there are no skips, sound is complete and doesn't undulate.
- Make sure preservation and access copies are same duration. Do the same with derivative copies if applicable.
- Make sure that the master digital image is a faithful representation of the original
- (if that is the goal), and that access and derivative copies adhere to presentation standards.
- Check waveform for unexpected spikes, lulls, or silences.

Metadata

- Check that metadata exists and is stored in the correct format and location.
- Check that content of metadata is accurate, complete, and valid.
  - Check file name and accuracy of descriptions as you do your audio inspection.
  - Check spelling and grammar.
  - Spot check subject designations and narrative descriptions against actual audio content.

Fixity Check

- At transfer and at decided rate (monthly, quarterly, etc.) for previously transferred files.

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Video Quality Review Checklist

File Management and Storage

- Check that the file has been properly transferred and is stored in the correct location in the primary storage server.
- Verify that preservation, access and derivative copies are present.
- Make sure the file names adhere to file naming convention, and correspond with content.
- Make sure the organization of files adheres to directory structure.
- Check that file size is as expected.
- If you see a problem with one file, check the surrounding video files.
- Create checksums for newly created files.

Visual and Audio Inspection

- Watch and listen to an 'increment of time' at the beginning, middle, and end of the recording.
    - Check that file plays and is complete.
    - Check for anything that might have been introduced during digitization (and that is not inherent to original recording).
    - Make sure there are no artifacts (visual issues lines, distortion, inconsistencies), problems with sound.
    - Make sure sound is in sync with video.
- Make sure preservation and access copies are same duration. Do the same with derivative copies if applicable.
- Make sure the master digital image is a faithful representation of the original (if
- that is the goal), and that access and derivative copies adhere to presentation standards.

Technical Specifications

- Check that technical information matches with standards for the project (file format, bit depth, sample rate, bit rate for access copy).
    - .mov specification: H.264 encoding with a 640X480 minimum pixel dimension, 30 bit sample size with a 30 MiB/s data rate.
    - .mp4 specification: H.264 encoding with a 640x480 minimum pixel dimension, between 4,000 - 4,500 kbps data rate (depending on content).

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Metadata

- Check that metadata exists and is stored in the correct format and location.
- Check that content of metadata is accurate, complete, and valid.
  - Check file name and accuracy of descriptions as you do your video inspection.
  - Check spelling and grammar.
  - Spot check subject designations and narrative descriptions against actual video content.

Fixity Check

- At transfer and at decided rate (monthly, quarterly, etc.) for previously transferred files.

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