



DRS Administrative Metadata for Digital Still Images

This data dictionary provides element descriptions for the <imageMetadata> block of “type-specific metadata” included in the Harvard University Library Digital Repository Services (DRS) deposit control file, batch xml, and defined by the DRS [batch DTD](#). With other required metadata, <imageMetadata> facilitates digital stewardship of still images deposited to the DRS. In this context, stewardship tasks and operations primarily refer to those to support image quality assessment, obsolescence monitoring, and image processing to support delivery requirements.

Many data elements in this dictionary serve to anchor meaningful attributes of image quality—such as detail, tone, color, and size—that can be measured objectively. Others support subjective assessments of “current value” by DRS staff, collection managers, or imaging specialists seeking to determine whether intrinsic image quality (aesthetic or functional) sufficiently justifies associated maintenance (e.g., storage), processing, or transformation costs.

Data elements and values are drawn from file format specifications, as well as guidelines from repositories committed to storing and managing large collections of images. (See *Sources*, p. 13.) Elements and values in this document apply inclusively to all images submitted to the DRS, regardless of their curatorially-assigned role as master or deliverable images.

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<http://hul.harvard.edu/ois/systems/drs/imagemetadata.pdf>

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Introduction

Usage

Organizations depositing images to DRS (“Depositing Agents”) should review this document in conjunction with the DRS *User Manual for Data Loading*, which provides DTD Base Element Descriptions (Section 6.0) and gives an overview of the deposit process. Links to this manual and all DRS documentation are provided at <http://hul.harvard.edu/ois/systems/drs/doc.html>.

Note that a number of elements outside the <imageMetadata> block are relevant to batch deposits of images, particularly the <relationshipMap>, which must be used to associate images with corresponding files (e.g., external targets, target data files, and color profiles).

Best Practice

HUL OIS strongly recommends instituting quality control practices to verify that internal metadata (e.g., TIFF tag values) accurately document the attributes of the file. (Unfortunately, not all imaging applications can be relied upon to record or retain this information.) In particular, one should ensure that internal metadata values are consistent with those externally provided in batch.xml. This is especially true for elements that document color space, where values supplied in batch.xml (e.g., for bitspersample and photointerp) depend upon *additional* values in the internal metadata (e.g., samplesperpixel and extrasamples) to interpret the image correctly.

Document Administration

This document is authored and administered by DRS analysts. All questions and comments should be directed to the OIS Metadata Analyst robin_wendler@harvard.edu, 617-495-3724.

Digital Still Images: technical metadata

Section 1: Image Attributes (Elements #1-13)

Values for these data elements are constructed to facilitate parsing and reporting. Data in the mandatory fields (#1-3, 6) and mandatory-if-applicable fields (#4-8) will be used to process image files to generate delivery versions files or to migrate content via image transformations.

Optional data (fields #9-13) support image processing in some cases. This information also facilitates object management and may have future use in helping collection managers, object owners, or DRS staff segregate files into like categories for analysis or processing.

| | |
|------------|---|
| Number | 1 |
| Name | bitspersample |
| Definition | <i>The number of bits per component for each pixel. This field provides N values depending upon the number of components (aka “channels”) in the image.</i> |

| | |
|-------------------|--|
| Required | M ¹ |
| Repeatable | N |
| Type | list of integers, one per component (or color channel); include one or more ASCII spaces between each number |
| Required values | 1 = 1-bit (bitonal) 4 = 4-bit grayscale 8 = 8-bit grayscale or palletized color [see Note for photointerp below] 16 = 16-bit grayscale 8 8 8 = 24-bit RGB and Kodak PhotoYCC 16 16 16 = 48-bit RGB, HDR 8 8 8 8 = CMYK, or RGB with one additional (alpha) channel 8 8 8 8 8 = CMYK or RGB with additional (alpha) channel(s) 8 8 8 8 8 8 = CMYK or RGB with additional (alpha) channels 16 16 16 16 = CMYK, or RGB with one additional (alpha) channel 16 16 16 16 16 = CMYK or RGB with additional (alpha) channel(s) 16 16 16 16 16 16 = CMYK or RGB with additional (alpha) channels |
| Deprecated values | 24 = <i>deprecated value (as of version 1.3 of this Data Dictionary; use 8 8 8)</i> 48 = <i>deprecated value (as of version 1.3 of this Data Dictionary; use 16 16 16)</i> |
| Mappings | TIFF 258 (<i>Baseline Required</i> , p22-24, 29) DIG35 A.3.4 Component Information (contains sub-fields) <xsd: COMPONENT_INFO> <NUM_COMPONENT> specifies # of components (e.g., “3” for RGB) <COMP_SIZE> specifies the bit-depth of each component (but only as single integer, <i>not</i> list of integers) |
| Notes | “Note that this field allows a different number of bits per component for each component corresponding to a pixel. For example, RGB color data could use a different number of bits per component for each of the three color panes. Most RGB files will have the same number of bitspersample for each component. Even in this case, the writer must write all three values.” (TIFF, p29) |

¹ M = mandatory, MA = mandatory if applicable, R = recommended, O = optional

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| Number | 2 |
| Name | compression |
| Definition | <i>Designates the compression scheme used to store the image data</i> |
| Required | M |
| Repeatable | N |
| Type | string |
| Numeric Values (TIFF) | 1 = uncompressed 2 = CCITT 1D 3 = Group 3 Fax 4 = CCITT Group 4 T.6-encoding 5 = LZW (Lempel Ziv Welch) 6 = JPEG 32773 = PackBits compression 65001 = lossless JPEG2000 (jp2, jpx) 65002 = lossy JPEG2000 (jp2, jpx) Image Pac = see <i>non-numeric value</i> below unknown = see <i>non-numeric value</i> below |
| Non-numeric Values | Image Pac = use for PCD (Kodak Photo CD) image unknown = when compression type cannot be determined |
| Mappings | TIFF 259 (<i>Baseline Required</i> , p21-24, 117) DIG35 A.3.1.4 Compression Method <xsd: COMPRESSION> type = string |
| Notes | Contact the Guideline Administrator to propose additions to the list. |

| | |
|------------|---|
| Number | 3 |
| Name | photointerp |
| Definition | <i>Designates photometric interpretation, the color space of the decompressed image data.</i> |
| Required | M |
| Repeatable | N |
| Type | enumerated type |
| Values | 0 = standard value for 1-bit images (WhiteIsZero: 0 is imaged as white) 1 = reversed polarity 1-bit, or grayscale (BlackIsZero: 0 is imaged as black) 2 = RGB 3 = Palette color [see <i>Notes</i> below] 5 = CMYK 6 = YcbCr (aka YCC) (also use for Kodak PhotoYCC, PhotoCD's color space) 8 = CIEL*a*b* [see <i>Notes</i> below] 9 = ICCL*a*b* [see <i>Notes</i> below] 65016 = sRGB [use for JPEG 2000 sRGB images] 65017 = grayscale colorspace [use for JPEG 2000 grayscale images] 65102 = embedded ICC profile [use for JPEG 2000 images] |
| Mappings | TIFF 262 (<i>Baseline Required</i> , p22-24, 37, and 90) DIG35: no mapping. A.3.3 "Color Information" refers to the colorspace of the decompressed image data, <i>not</i> the internal colorspace at the file format level. |
| Notes | When photointerp = 3 (Palette color). In this model, a color is described with a single component. The value of the component is used as an index into the red, green and |

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| | <p>blue curves in the ColorMap field to retrieve an RGB triplet that defines the color. When photointerp = 3, a ColorMap must be present in the image and, in the case of TIFF, SamplesPerPixel must be 1.</p> <p>When photointerp = 6, TIFF/EP requires use of the following four tags: 530 YCbCrSubSampling, 531 YCbCr Positioning, 529, YcbCrCoefficients, 532 ReferenceBlackWhite</p> <p>See also, TIFF Section 21 YCbCr Images for additional information regarding TIFF YcbCr (<i>Class Y</i>) images.</p> <p>When photointerp = 8 (CIELAB), value for bitspersample = 8 8 8 or 16 16 16.</p> <p>When photointerp = 9 (ICCL*a*b*), see, Adobe PageMaker ® 6.0 TIFF Technical Notes, September 14, 1995, p. 13, http://partners.adobe.com/asn/developer/pdfs/tn/TIFFPM6.pdf.</p> |
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| | |
|------------|---|
| Number | 4 |
| Name | xres |
| Definition | <i>Designates the number of pixels per resunit in the image width.</i> |
| Required | MA (when resunit = 2 or 3) |
| Repeatable | N |
| Type | positive integer |
| Values | (null) = when resunit is 1 any positive integer = when resunit is 2 or 3 |
| Mappings | TIFF 282 (<i>Baseline Required</i> , p21-24, 41) DIG35: no mapping. B.3.3.3 Scanner Capture Settings specifies the physical scanning resolution of the device in the X (width) and Y (height) directions, specifying the values in meters. |
| Examples | 300 400 600 |
| Notes | This number refers to <i>final</i> number of pixels per resunit in the image width, regardless of whether the resolution is “true” or interpolated. (See also optres .) For multiple-resolution image file formats (e.g., PCD), this value shall refer to the highest resolution image. With resunit and yres , xres specifies the preferred dimensions for an output print. |

| | |
|------------|--|
| Number | 5 |
| Name | yres |
| Definition | <i>Designates the number of pixels per resunit in the image length.</i> |
| Required | MA (when resunit = 2 or 3) |
| Repeatable | N |
| Type | positive integer |
| Values | (null) = when resunit is 1 any positive integer = when resunit is 2 or 3 |
| Mappings | TIFF 283 (<i>Baseline Required</i> , p21-24, 41) DIG35: no mapping. B.3.3.3 Scanner Capture Settings specifies the physical scanning resolution of the device in the X (width) and Y (height) directions, specifying the values in meters. |
| Examples | 300 400 600 |
| Notes | This number refers to <i>final</i> number of pixels per resunit in the image height, regardless of whether the resolution is “true” or interpolated. (See also optres .) For multiple-resolution image file formats (e.g., PCD), this value shall refer to the highest resolution image. With resunit and xres , yres specifies the preferred dimensions for an output print. |

| | |
|------------|---|
| Number | 6 |
| Name | resunit |
| Definition | <i>Designates the intended placement of pixels in the xres and yres dimensions of the printed image.</i> |
| Required | M |
| Repeatable | N |
| Type | enumerated type |
| Values | 1 = no absolute unit; no meaningful absolute dimensions 2 = inch 3 = centimeter |
| Mappings | TIFF 296 (<i>Baseline Required</i> , p21-24, 38) DIG35: no mapping |
| Notes | Value = 1 for images that may have a non-square aspect ratio, but no meaningful absolute dimensions. In copy work, this value should also be used when source measurements are unknown, such as when 35mm slides or 35mm microfilm intermediates are scanned. |

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| Number | 7 |
| Name | qualitylayers |
| Definition | <i>Number of quality layers to which each JPEG2000 image tile has been decomposed. Useful in determining the number of lower quality images that can be extracted from the JPEG2000 image.</i> |
| Required | MA |
| Repeatable | N |
| Type | integer greater than or equal to 1 |
| Mappings | JPEG2000 |
| Examples | 12 |
| Notes | Mandatory for JPEG2000 images (jp2, jpx) |

| | |
|------------|---|
| Number | 8 |
| Name | reslevels |
| Definition | <i>Number of resolution levels to which each JPEG2000 image tile has been decomposed. Useful in determining the size of the smallest subresolution thumbnail image available in the JPEG2000 image.</i> |
| Required | MA |
| Repeatable | N |
| Type | integer greater than or equal to 1 |
| Mappings | JPEG2000 |
| Example | 6 |
| Notes | Mandatory for JPEG2000 images (jp2, jpx) |

| | |
|------------|---|
| Number | 9 |
| Name | imagewidth |
| Definition | <i>Designates the number of columns per image, i.e. the total number of pixels in the horizontal or X dimension.</i> |
| Required | O |
| Repeatable | N |
| Type | positive integer |
| Mappings | TIFF 256 (<i>Baseline Required</i> , p21-24, 34) DIG35 A.3.1.3 Image Size <xsd: IMAGE_SIZE> contains sub-fields <WIDTH> in pixels |
| Examples | 3072 |
| Notes | For multiple-resolution image file formats (e.g., PCD), this value shall specify the pixel count at the highest resolution. Note that imagewidth is not the same as xres , which refers to the total number of pixels per resunit . |

| | |
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| Number | 10 |
| Name | imageheight |
| Definition | <i>Designates the number of rows per image, i.e. the total number of pixels in the vertical or Y dimension.</i> |
| Required | O |
| Repeatable | N |
| Type | positive integer |
| Mappings | TIFF 257 (<i>Baseline Required</i> , p21-24, 34) DIG35 A.3.1.3 Image Size <xsd: IMAGE_SIZE> contains sub-fields <HEIGHT> in pixels |
| Examples | 2048 |
| Notes | For multiple-resolution image file formats (e.g., PCD), this value shall specify the pixel count at the highest resolution. Note that imageheight is not the same as yres , which refers to the total number of pixels per resunit . |

| | |
|------------|--|
| Number | 11 |
| Name | orientation |
| Definition | <i>Designates the orientation of the image, with respect to the placement of its columns (imagewidth) and rows (imageheight), as it was saved to disk.</i> |
| Required | O |
| Repeatable | N |
| Type | enumerated type |
| Values | 1 = normal* 3 = normal rotated 180° 6 = normal rotated cw 90° 8 = normal rotated ccw 90° 9 = unknown |
| Mappings | TIFF 274 (p36) DIG35 B.3.2.5 Camera Capture Settings <xsd: CAMERA_SETTINGS> <xsd: complexType> <xsd: ORIENTATION> type=dig35:tDirection (see, F.2.16) |
| Notes | This field is to be used to record only the orientation of the image, <u>not</u> the orientation of the device (e.g., camera) used to capture the image (see, DIG35 B.3.2.5 “Camera Capture Settings”) and TIFF/EP 5.2.12, which defines orientation as “...the orientation of the camera relative to the scene, when the image was captured.” * “normal” is defined as follows: when opened, the top (0 th) row of pixels corresponds to the visual top of the image, and the first (0 th) column of pixels on left corresponds to the visual left-hand side of the image. Consult TIFF for additional values referring to mirrored images. (Note that TIFF/EP supports only the five values listed above.) Contact the Guideline Administrator to propose additions to the list of acceptable |

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| | values. |
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|------------|---|
| Number | 12 |
| Name | targetnotes |
| Definition | <i>Designates the name of the “internal” target(s) scanned in-frame with the source item.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Values | string, string; string, string |
| Mappings | TIFF: no mapping DIG35: no mapping |
| Examples | <i>One target:</i> Kodak Q-60EI Target for Kodak Ektachrome, IT8.7/1-1993 <i>Two targets:</i> Kodak 18% gray card; Kodak Q-60EI Target for Kodak Ektachrome, IT8.7/1-1993 |
| Notes | <p>Recommended syntax: use manufacturer’s full name of target, including its associated standard, whenever possible. Separate each sub-part by a comma and a single space. When multiple targets are used, separate target 1 from target 2 (etc.) by a semicolon and a single space.</p> <p>For information about external targets—i.e., those scanned and saved as independent images—review the element description for <relationshipMap> in the Digital Repository Services (DRS) User Manual for Data Loading (http://hul.harvard.edu/ois/systems/drs/drs_load_manual.pdf).</p> <p>“Targets are used as concise physical benchmarks for absolute energetic and spatial information about the item of interest at time of capture. They are, in essence, Rosetta stones for the source. As such, their utility is undisputed whenever corrections or faithful reconstructions of the source document are required. ...</p> <p>Depending on workflows and philosophy, targets can be considered as either external or internal to a digital image. <u>Internal targets are part of a digital image by being within the field of view at time of capture.</u> External targets are typically captured session-to-session and usually give temporally sparse information between image captures. For stable capture environments their utility can be equivalent to internal targets. Since they are not part of the digital image itself, their location must be managed in order to maintain a thread to the source.” (<i>NISO Data Dictionary</i>, p. 30, emphasis added.)</p> |

| | |
|------------|---|
| Number | 13 |
| Name | history |
| Definition | <i>Designates the image change history.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Mappings | DIG35 Annex D: History Metadata |
| Notes | <i>Recommended practices for use of this field are under review. Consult the Guideline Administrator before recording metadata in this field.</i> |

Section 2: Image Production Attributes (Elements #14-20)

All elements in this category are optional. Reporting, not parsing, is the intended application. Owners and preservation managers might, for example, use this metadata to build queries and reports to answer questions such as, “Are these images worth the cost of migration? Could quality be improved by rescanning? This metadata might also aid in the drafting of technical specifications for the production of new archival or delivery images.

| | |
|------------|---|
| Number | 14 |
| Name | source |
| Definition | <i>Designates the physical attributes of the source material relevant to interpreting digital image accuracy and/or quality.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Mappings | DIG35 B.3.5 Captured Item <xsd: CAPTURED_ITEM> <REFLECTION_PRINT> type=complexType <FILM> type=complexType |
| Example | 8" x 10" black and white print yellowed with age 35mm color negative Kodak Royal Gold 100 Emul. 3712011 |
| Notes | Use this field to document the physical attributes of the source material <i>not already recorded in descriptive metadata</i> that is relevant to the interpretation of the accuracy and/or quality of the digital image. |

| | |
|------------|--|
| Number | 15 |
| Name | system |
| Definition | <i>Designates the manufacturer and model names/numbers for the scanner or digital camera and its associated driver/imaging software.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Values | Scanner Manufacturer Name; Model Name/Number; Software Name and Version Number |
| Mappings | TIFF 271, 272, 305 (p35, 35, and 39) |

| | |
|---------|---|
| | DIG35 B.3.4 Software Creation <xsd: complexType> DIG35 B.3.3 Scanner Information, and B.4.1 Creation Information of a Digital Camera (includes metadata for Manufacturer and Model) xsd: complexType name="tProductDetails" (see, F.2.18) |
| Example | Scitex; Leaf Volare; Leaf Colorshop 4.0 |
| Notes | Recommended syntax: record values in following order: manufacturer ("Make"); model name or number followed by serial number of device if desired ("Model"); software name and version number ("Software"). For TIFF, concatenate values and separate each value with a semicolon followed by a blank space. This field refers only to the image capture system. Related field: prosoftware . |

| | |
|------------|--|
| Number | 16 |
| Name | producer |
| Definition | <i>Designates the organization-level producer(s) of the image.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Values | free text |
| Mappings | TIFF 315 Artist (p28) <i>might</i> apply, but use caution – technically speaking, this field is to be used to record the name of the “person who created the image” DIG3 B.3.1 General Creation Information <xsd: complexType> <xsd: element name=OPERATOR_ORG type=dig35:tOrganization> |
| Examples | Luna Imaging, Inc. HCL Digital Imaging Group [multiple producers] Luna Imaging, Inc.; HCL Digital Imaging Group |
| Notes | Separate names of bureaus with a semicolon followed by a blank space. When multiple service bureaus are used, explain each bureau’s role in the methodology . |

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|------------|---|
| Number | 17 |
| Name | optres |
| Definition | <i>Designates the actual number of photo elements in the scanning sensor (colloquially known as “the maximum optical resolution” for a system).</i> |
| Required | O |
| Repeatable | N |
| Type | string |

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| Values | [any positive integer] dpi = *use for all linear-sensor scanners (MonochromeLinear, ColorTriLinear, ColorSequentialLinear) longer dimension [positive integer] x smaller dimension [positive integer] = *use for all area-sensor scanners (MonochromeArea, OneChipColorArea, TwoChipColorArea, ThreeChipColorArea, ColorSequentialArea) |
| Mappings | TIFF: no mapping DIG35: no mapping |
| Examples | 400 dpi 3,072 x 2,048 |
| Notes | This element helps to characterize the quality of the scanner that was used. This number is likely to be different from xres and yres . |

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|------------|---|
| Number | 18 |
| Name | prosoftware |
| Definition | <i>Designates the name and version of the image processing software used to edit or transform the image data captured at scanning.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Mappings | TIFF: no mapping DIG35: no mapping |
| Examples | Adobe Photoshop 4.0 TMS Sequoia ScanFix 4.0 TMS Sequoia ScanFix 4.0; Adobe Photoshop 4.0 |
| Notes | Recommended syntax for a single program: manufacturer software version. When multiple programs are used, concatenate values and the values for program 1 from program 2 with a semicolon followed by a blank space. If possible, record these names in chronological order (first to last). Do not include the name of the scanning software in this field. See system . |

| | |
|------------|---|
| Number | 19 |
| Name | enhancements |
| Definition | <i>Designates the settings, or description of their function, used by the prosoftware.</i> |
| Required | O |
| Repeatable | N |
| Type | string |
| Mappings | TIFF: no mapping DIG35: no mapping |
| Examples | hue/saturation correction despeckling, deskewing, and sharpening |
| Notes | Use this field to note the processes applied (“actions”) – ideally as an ordinal listing—to the image data created at scanning, particularly irreversible transformations (such as sharpening) that bear upon image quality. For multiple actions, separate the |

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| | <p>descriptions for each by a semicolon and single space.</p> <p>If the script itself is to be saved as a separate file (e.g., <i>photoshop.ATN</i>), this object must be accommodated in the DTD in a manner similar to that used for profiles and performance data related to targets. (See the <i>objectData</i> portion of the DRS DTD.)</p> |
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|------------|--|
| Number | 20 |
| Name | methodology |
| Definition | <i>Designates the methodology and rationale to digitize an object or collection.</i> |
| Required | O |
| Repeatable | N |
| Type | String (4,000 characters max.) |
| Mappings | TIFF: no mapping DIG35: no mapping |
| Examples | <p>[example from Harvard LDI project] Digital images were created by staff in the Harvard College Library Digital Imaging Group in 1999 by scanning printed original pages with an auto-document-feeder scanner. Prior to scanning, Harvard College Library Conservation Services disbound and trimmed pages from duplicate copies of annual reports.</p> <p>Each side of each page, including blank pages, was scanned to create a 600 dpi 1-bit TIFF archival image. All archival images were saved with Group 4 compression. Following scanning, all 1-bit TIFFs were enhanced using TMS Sequoia's ScanFix™ software to optimize the files for optical character recognition (OCR). These files were delivered to University of Michigan Digital Library Production Services for OCR and low-level SGML markup compliant with Text Encoding Initiative (TEI) guidelines. The OCR-generated ASCII was not corrected. Structured evaluations confirmed that these specifications yielded page images sufficient to create 1:1 preservation-quality reprints, as well as OCR-generated ASCII adequate to support a search retrieval rate of 97%.</p> <p>For on-screen display in the page-turning application, 100 dpi 4-bit GIF images were created from the archival TIFFs. Image Alchemy was used for TIFF-to-GIF conversion. Evaluations confirmed that this specification achieved the optimum balance between legibility and size, with an 800 x 600 pixel monitor designated as the default monitor resolution.</p> |
| Notes | <p>Use this free-text field to document a project rationale for digitization and/or any aspects of the conversion process not already accounted for in other technical metadata. If you choose to use a local filename as the free-text for this field — as an alternative to including a methodology note with each image — you will <i>not</i> be able to query DRS to list the files associated with a given methodology.</p> <p><i>Best Practice:</i> Describe only ONE production method in the methodology statement. If, for example, a digitization <i>project</i> entails creating two “classes” of page images—e.g., bitonal and color—then the producer would create <i>separate batches</i> of images for deposit, one for bitonal images, and the other for color. The former would include the detailed methodology pertaining to the production of 1-bit images; the latter would include the detailed methodology pertaining to the production of color images.</p> |

Sources

[DIG 35] Digital Imaging Group DIG35. *DIG35 Specification: Metadata for Digital Images, Version 1.1*, June 18, 2001, Annexes A, B, and D, available for download at http://www.i3a.org/i_dig35.html

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[JPEG 2000] ISO/IEC 15444-1:2000, *Information technology -- JPEG 2000 image coding system - Part 1: Code coding system*, July 31, 2002, Final Committee Draft (FCD) version available as <http://www.jpeg.org/public/fcd15444-1.pdf>.

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[TIFF] Adobe Developers Association. *TIFF (Tagged Image File Format) 6.0 Specification*, updated September, 20 1995, document dated June, 3 1992, <http://partners.adobe.com/asn/developer/PDFS/TN/TIFF6.pdf>

[W3C] W3C. "NOTE-datetime, *Date and Time Formats*," <http://www.w3.org/TR/NOTE-datetime>

Revision History

| VERSION | CONTACT | LAST UPDATE | STATUS |
|---------|---------|-------------------|---|
| 0.1 | SMC | January 5, 2000 | |
| 1.0 | SMC | June 8, 2000 | released for use |
| 1.1 | SMC | October 25, 2000 | Removed <ICC> element Removed <type> element Removed <scannertargetstruct> element: accommodated by “IS_TARGET_OF” value in <relationshipMap> |
| 1.2 | SMC | February 20, 2002 | Removed <displayorient> element Removed <modified> element – only used at update, not initial deposit; use “History” or “Methodology” field to record provenance Updated “mappings” and “notes” to be consistent with DIG35 v1.1 Updated Sources |
| 1.3 | SMC | March 26, 2004 | Deprecated two values in <bitspersample> Updated document to accommodate JPEG2000 (image/jp2, image/jpx) images Added JP2 values to <compression> Added JP2 values to <photointerp> Added JP2 element <qualitylayers> Added JP2 element <reslevels> |
| 1.4 | SMC | August 20, 2007 | Updated usage and added best practice Added values to bitspersample to accommodate use of alpha channels Updated “methodology” and Sources |