

Clipboard People

The Role of Metadata in Production

Abstract

- Production metadata exists to help people work on the same project who will never meet. It exists to remind you of what you did in the middle of the night. It exists to identify when something was made, what you have, where you got it, how it was done, and who is to blame. This talk examines issues in current digital production needs for metadata and discusses general rules for metadata design. The color management capabilities of the Academy's Image Interchange Framework are described as a method for future production needs.

What is Metadata?

Old Fashioned

New

Stodgy

Cool

Stale

Trendy

Cobol, RPG II

XML, Hyperlinked

Data

Metadata

Production Old School

Clipboards and Forms

Database

- Records
- Unique Keys
- Relationships
- Search
- Queries

Metadata

- Streams
- Tags
- Links
- Processing
- Categorize

SMPTE Metadata Classes

- . Identification: abstract identifiers and locators.
- . Administration: administrative and business related metadata.
- . Interpretation: information on interpreting the data.
- . Parametric: parametric and configuration metadata.
- . Process: information about the essence or metadata processing.
- . Relational: information about the relationships between data.
- . Spatio-temporal: information about space and time.
- . Registered Metadata: two sub-classes: public and private
- . Experimental Metadata: User defined



Movie Production 101

5 Minute Version



Script





Schedule

Budget

Camera

Art Dept

Makeup

Costumes

Set

VFX

Transportation

Breakdown

Casting

Call Sheets





Skip the rest of Pre Production...



Principal Photography

Camera Lab Telecine ColorCorrect

Editorial Sync Dailies

Sound Ingest Logging Playback





Principal Photography

Color Management

Instructions

Color Correct

Render

Dailies

Finals





Skip the rest of Production...



Post Production

Conform to Edit Decision List

Color Correct

+ Versioning

Final Image

Assemble with Sound, Titles, and Captions

Package



On Set

- camera report
- audio logs
- sync timecode
- LUTs, ASC-CDL

In Post

- Scan Pull Lists
- Sound logs
- ALEs, FlexFiles, EDL
- ASC-CDL, Luts

Digital Cameras

- Record Settings?
 - 146 Parameters +
- Metadata Entry

- **Essences**
 - **Images,**
 - **Audio,**
 - **Captions,**
 - **Titles**

Data & Metadata

➤

➤ what

➤ when

➤ where

➤ how

➤ who

Digital Data

- Streams

- Embedded

- Ex: MXF

- Collections of Files in Directories

- Separate

- Ex: .dpx

.. but need database management

Metadata Capabilities

- Flexible Linkages
- Extensible
- Namespaces
- Machine interpretation
- User accessible (needs catalogs)

Thoughts on Production Metadata

Every 'box' has a cost

Save Everything Always

Save as Little as Possible

No metadata is better
than Bad metadata

It is never Complete,

You can never capture
Everything

Metadata allows
variations to multiply

DPX Header

Table 4 – Video Signal Standard

Code	Signal standard
0	Undefined ¹⁾
1	NTSC
2	PAL
3	PAL-M
4	SECAM
5 – 49	Reserved for other composite video
50	YCbCr ITU-R 601-5 525-line, 2:1 interlace, 4:3 aspect ratio
51	YCbCr ITU-R 601-5 625-line, 2:1 interlace, 4:3 aspect ratio
52 – 99	Reserved for future component video
100	YCbCr ITU-R 601-5 525-line, 2:1 interlace, 16:9 aspect ratio
101	YCbCr ITU-R 601-5 625-line, 2:1 interlace, 16:9 aspect ratio
102 – 49	Reserved for future widescreen
150	YCbCr 1050-line, 2:1 interlace, 16:9 aspect ratio
151	YCbCr 1125-line, 2:1 interlace, 16:9 aspect ratio (SMPTE 274M)
152	YCbCr 1250-line, 2:1 interlace, 16:9 aspect ratio
153	YCbCr 1125-line, 2:1 interlace, 16:9 aspect ratio (SMPTE 240M)
154 – 199	Reserved for future high-definition interlace
200	YCbCr 525-line, 1:1 progressive, 16:9 aspect ratio
201	YCbCr 625-line, 1:1 progressive, 16:9 aspect ratio
202	YCbCr 750-line, 1:1 progressive, 16:9 aspect ratio (SMPTE 296M)
203	YCbCr 1125-line, 1:1 progressive, 16:9 aspect ratio (SMPTE 274M)
204 – 254	Reserved for future high-definition progressive

¹⁾ For an undefined video signal standard, it is necessary to specify the following fields that would otherwise be fully specified by selecting one of the video signal standards:

68	Gamma
69	Black level code value
70	Black gain
71	Breakpoint

Table 5A – Transfer Characteristic

Code	Transfer characteristic
0	User defined
1	Printing density
2	Linear
3	Logarithmic [to be defined by SMPTE I23 Technology Committee, sub-group on "Transfer Characteristics"]
4	Unspecified video
5	SMPTE 274M
6	ITU-R 709-4
7	ITU-R 601-5 system B or G (625)
8	ITU-R 601-5 system M (525)
9	Composite video (NTSC); see SMPTE 170M
10	Composite video (PAL); see ITU-R 624-4
11	Z (depth) – linear
12	Z (depth) – homogeneous (distance to screen and angle of view must also be specified in user-defined section)
13 – 254	Reserved for future use

Table 5B – Colorimetric Specification

Code ¹⁾	Colorimetric Specification
0	User defined
1	Printing density
2	Not applicable
3	Not applicable
4	Unspecified video
5	SMPTE 274M
6	ITU-R 709-4
7	ITU-R 601-5 system B or G (625)
8	ITU-R 601-5 system M (525)
9	Composite video (NTSC); see SMPTE 170M
10	Composite video (PAL); see ITU-R 624-4
11	Not applicable
12	Not applicable
13 – 254	Reserved for future use

¹⁾ The codes are assigned to correspond to those in table 5A, except where there is no appropriate colorimetric specification.

If the assumed process
changes, metadata has little
value

Metadata LifeCycle

born ..

grows..

fulfills it's purpose..

then dies

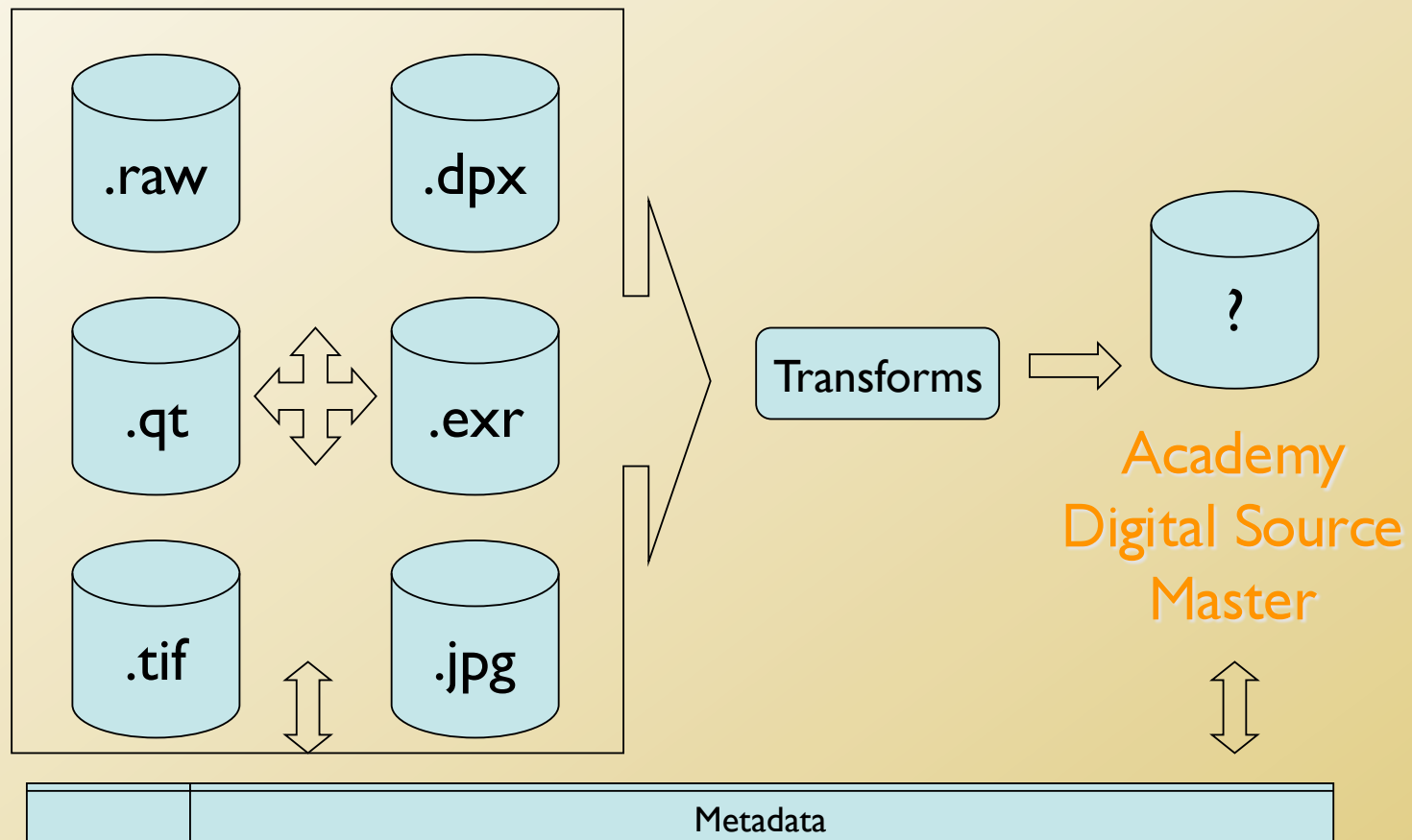
Digital Objects

Academy

Image Interchange Framework



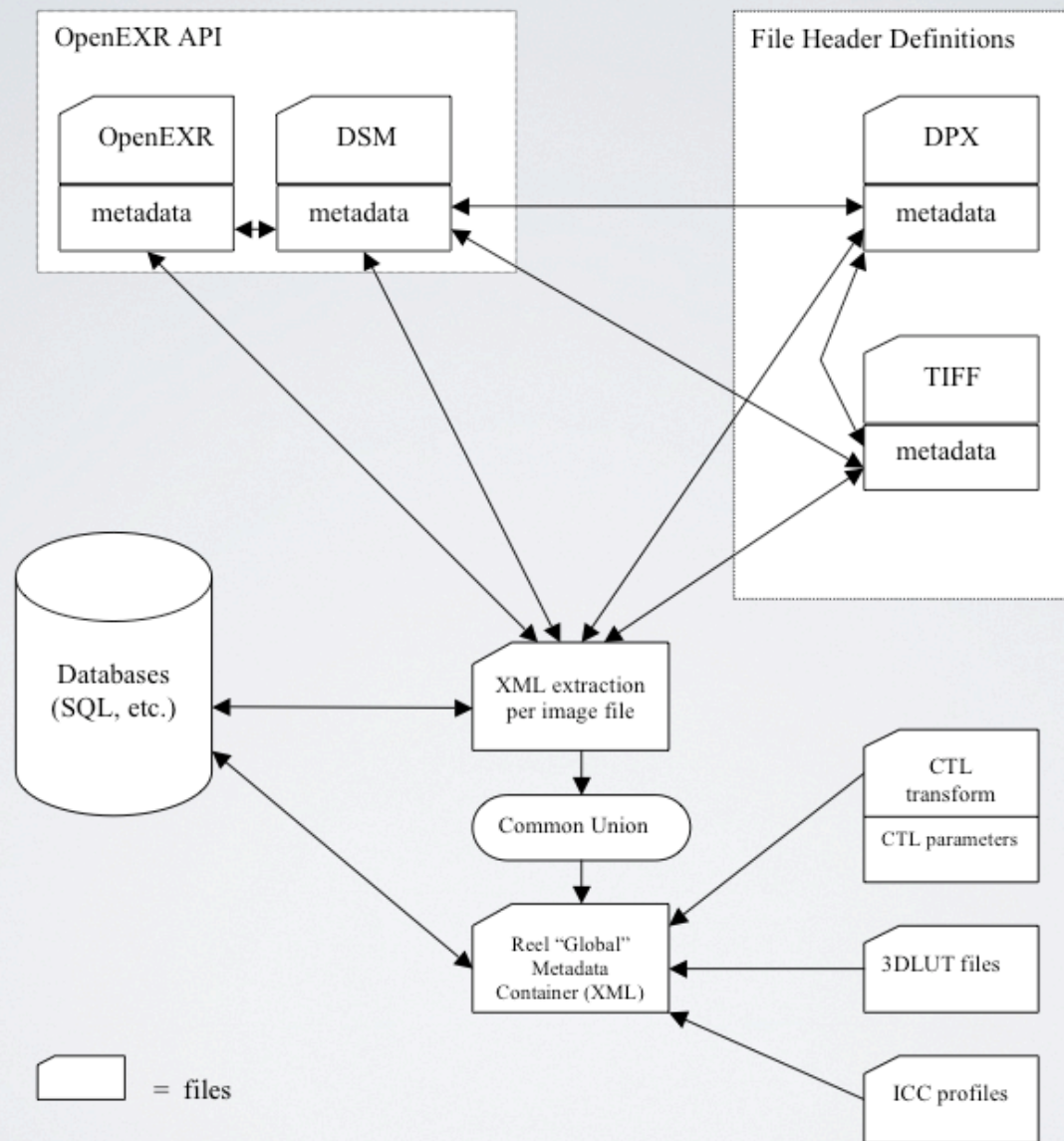
- Why a framework?



- Image files
 - - Image Container
 - Minimal metadata
- Metadata files
 - - XML containers for common metadata
 - (shot, reel, show levels)

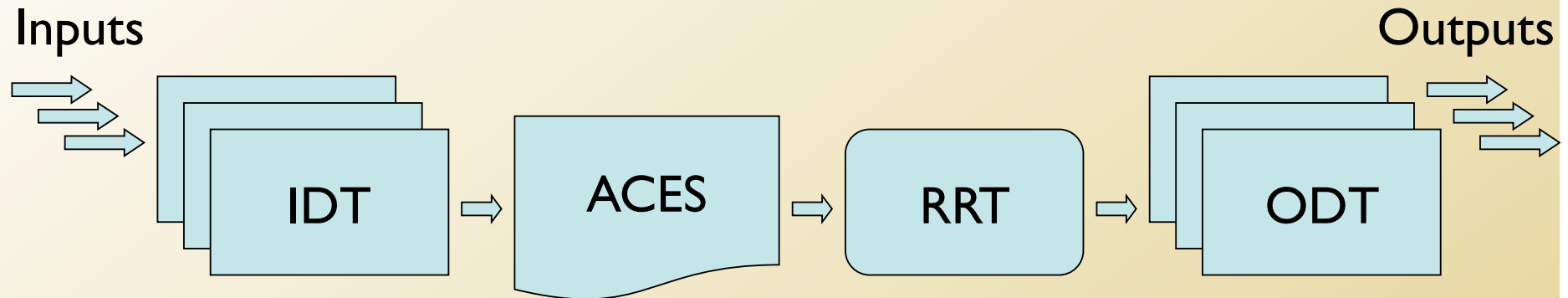
Metadata Graph

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- Film and Digital Interoperation
- Simplify Image Conversions
- Provide fixed color transforms for common uses
- Averaged and ‘universal’ conversions
- Floating point colors (all possible colors)

- **Colorimetric specification**
 - Each code value maps to a specific color
- **Linear Light**
- **Wide gamut colors**
 - Cover the visible gamut
 - Use RGB primaries



IDT - Input Device Transform

ACES - Academy Color Encoding Space

RRT - Reference Rendering Transform

ODT - Output Device Transform

Standardized color space for ACES with fixed color transforms

reduces need for color metadata,

reduces conversion errors in processing,

improves color management, and

still allows custom workflows

Need to define
cohesive Digital Objects
for stream and file-based workflows
to carry essences, manage metadata, and link to databases