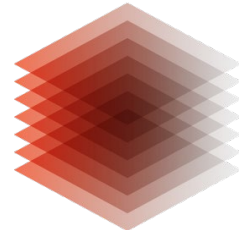

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TIB

When Digital Remembers Analogue

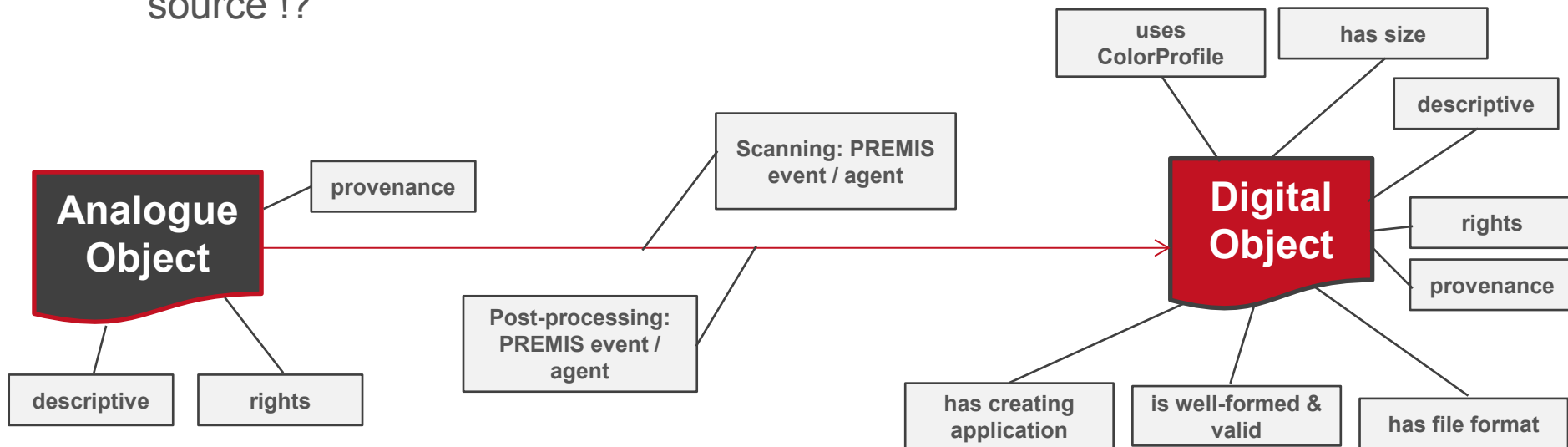
M. Lindlar, M. Reiche, M. Friedrich
Virtual, 21. October 2021
iPRES 2021

Agenda

1. The „Why“ – Motivation for this work
2. The „What“ – deciding on relevant analogue quality information
3. The „To Where“ – mapping analogue to digital
4. The „How“ – developing a schema

General facts and a simple question

- we put great effort into capturing (technical) metadata about the digital object
- for digitized objects, we often capture information about the hardware and software used in production and post-processing
- we capture descriptive information, rights information and provenance information
- but ... if we want to understand why the digital object looks / behaves like it does, why don't we capture information about the quality of the analogue source !?



Background – TIB’s Motivation

TIB is not a sound & vision archive ...
... but we do have AV-materials

Institute for Scientific Film (IWF)

- 11.500 film titles
- 33.000 film copies

Encyclopaedia Cinematographica (EC)

- Founded in 1952 by Gotthard Wolf
- Focus on “smallest thematic entity”, resulting in very specialized films which mirror encyclopedia entries (e.g., “baking bread” for cultural studies; movement studies for life sciences)
- Different Subject categories



DELFT Project – Ethnological Films of EC



Background – DELFT digitization project

Content

Ethnological subcollection within IWF EC

1.953 films

- 16 mm b/w or color - silent
- 16 mm b/w or color - with optical tracks and in some cases additional SEPMAG magnetic tapes and/or asynchronous audiotapes
- Digital Betacam (currently not covered in conservation metadata schema)



Background & Scope

- TIB's conservator and digital preservation specialists worked hand-in-hand
- 1st large scale AV digitization project at TIB → gain experience (!!) about:
 - required resources on both, conservator and digital preservation sides
 - knowledge about quality of the material
 - digitization parameters
 - semi-automatic quality analysis of external digitization results
 - digital preservation requirements

What to capture – Analogue Quality Information

- Quality criteria were determined by conservator
- Impact of criteria on digital object was discussed with digital preservation team
- Autopsy of film previous to digitization to:
 - choose best copy to digitize (multiple copies per film available)
 - Analyze damage to film / quality criteria→ Result of autopsy captured in spreadsheet
- Further automatic quality checks during scan process

General Info:

Identifier
Total number of reels

Information for film reel:

Part No.
Copy
Carrier Material
Information on Film Container
Shrinkage (automatic)

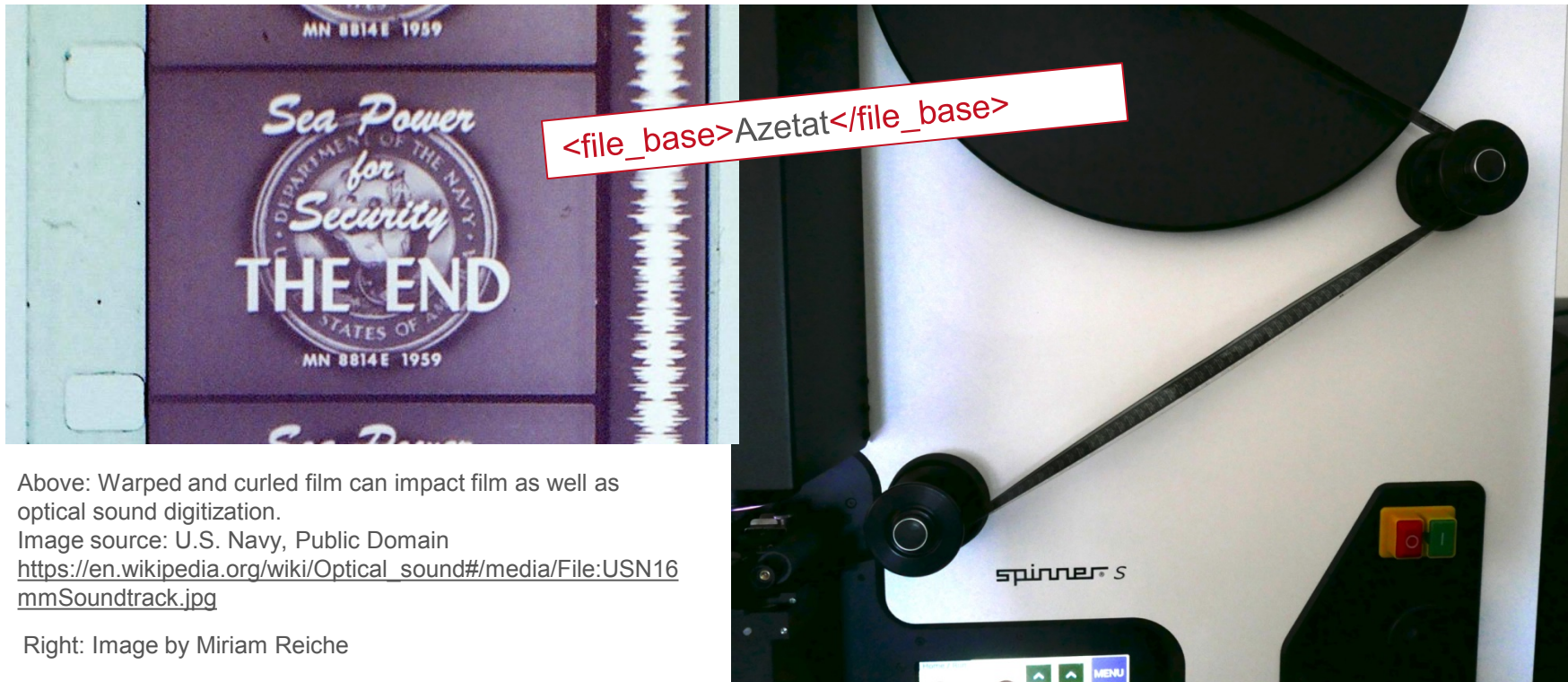
Ph-Test
Deformation
Perforation Damage
Splice Count

Information for audio:

Audio Stream Number
Signal Base

Carrier information: Cellulose Acetate

- **Captured during:** visual autopsy by conservator
- **Captured as:** text (either acetate, nitrate or polyester possible; in DELFT case all acetate)
- **Captured because:** each carrier material has unique risks; cellulose acetate can curl and warp due to deterioration, impacting digitization

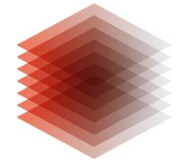


Above: Warped and curled film can impact film as well as optical sound digitization.

Image source: U.S. Navy, Public Domain

https://en.wikipedia.org/wiki/Optical_sound#/media/File:USN16mmSoundtrack.jpg

Right: Image by Miriam Reiche



„Smelling the problem“ – vinegar syndrome



```

<ph_test>
  <date_measured>2018-03-16</date_measured>
  <value>4.8</value>
</ph_test>
  
```

Images: Miriam Reiche

- **Captured during:** ph-tests ran by conservator (for parts of collection only)
- **Captured as:** ph-Value according to strip and color chart
- **Captured because:** helps understand the rate at which analogue material in collection degrades; can be indicator for vinegar syndrome → potential warping → blurs

Deformation of film resulting in blurring

Deformation: Low

→ leads to partial blurring on left



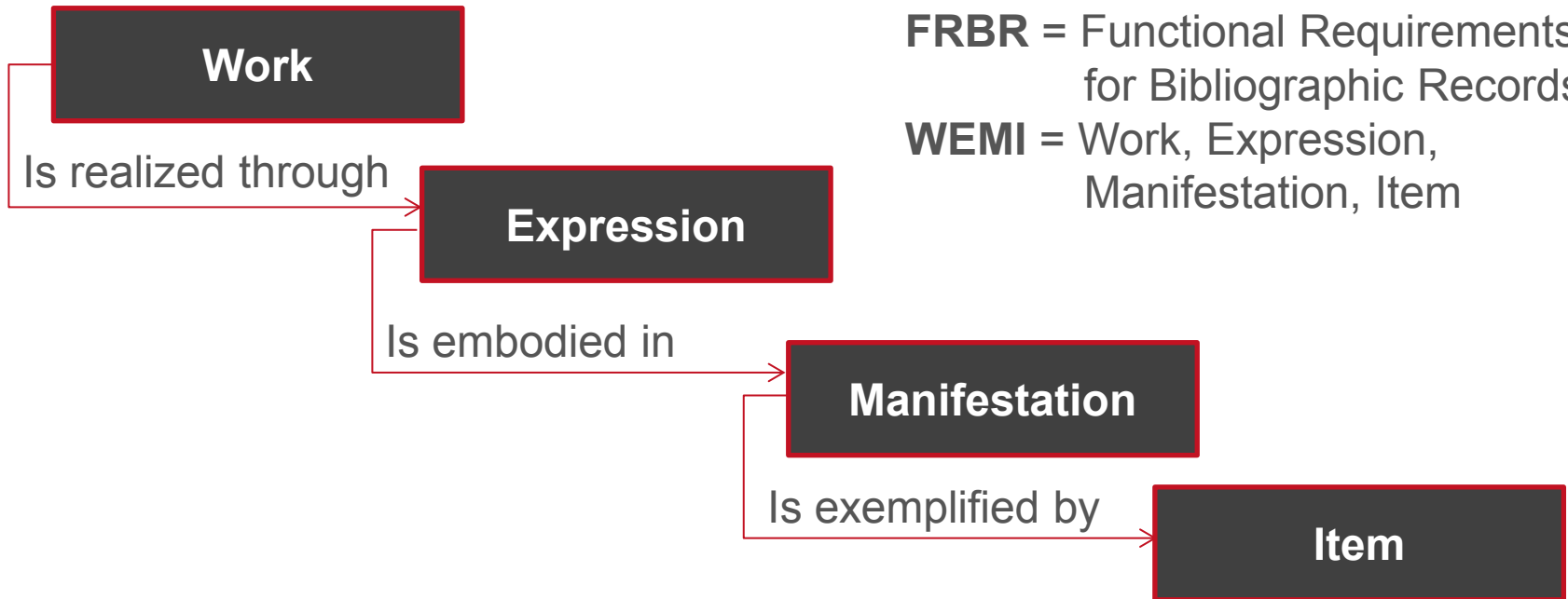
Deformation: Strong

→ significant blurring



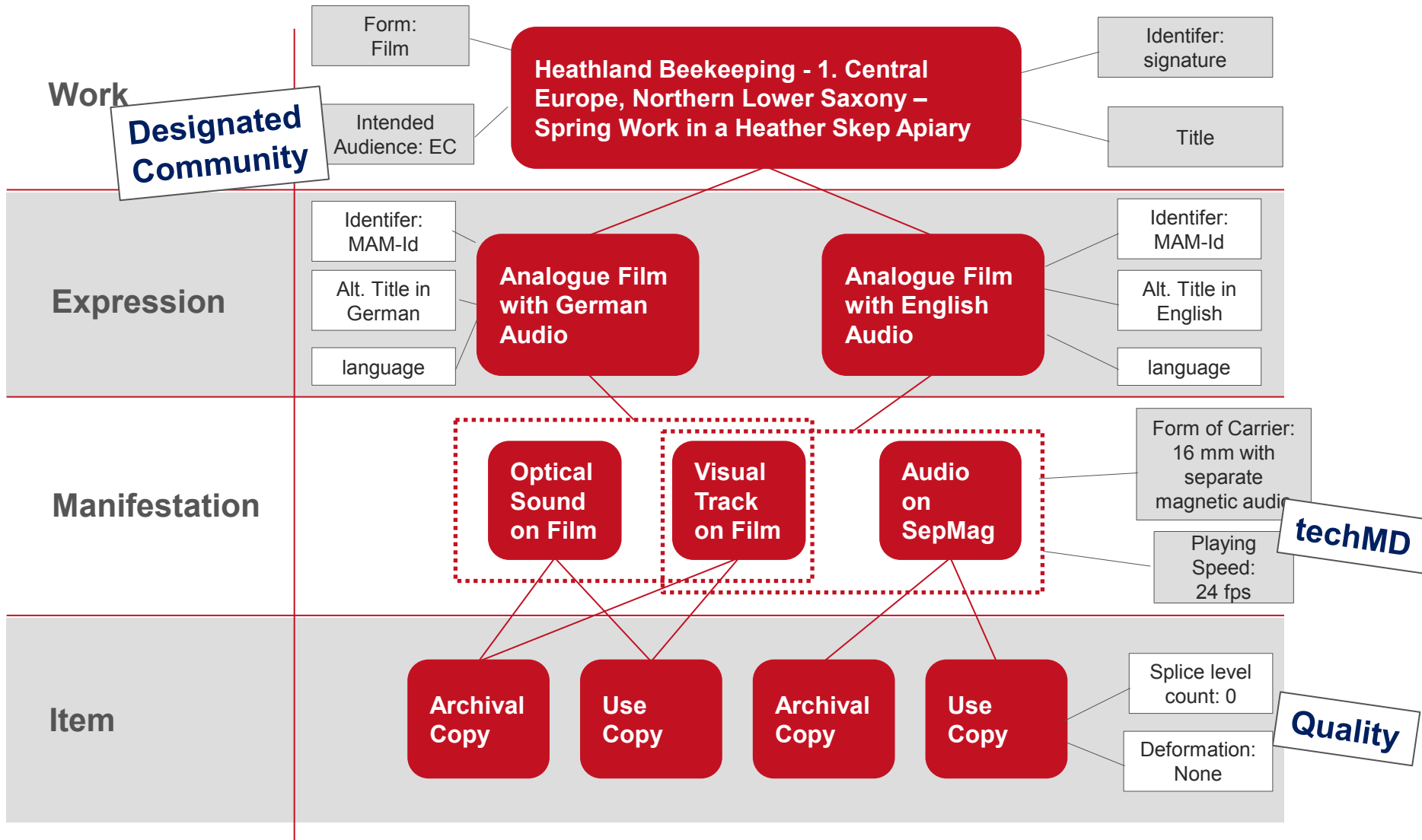
- **Captured during:** visual autopsy by conservator
- **Captured as:** ranked as „none“, „small“, „medium“, „strong“
- **Captured because:** Helps contextualize perceivable blurs in digital object

Mapping the Analogue: FRBR-WEMI



- Conceptual descriptive model introduced by IFLA in 1998
- Widely adopted in library world; embedded in RDA (Resource Description and Access) cataloging rules
- Ideal for TIB's use case:
 - Well understood in library-world
 - Very flexible

An analogue view – DELFT objects in WEMI

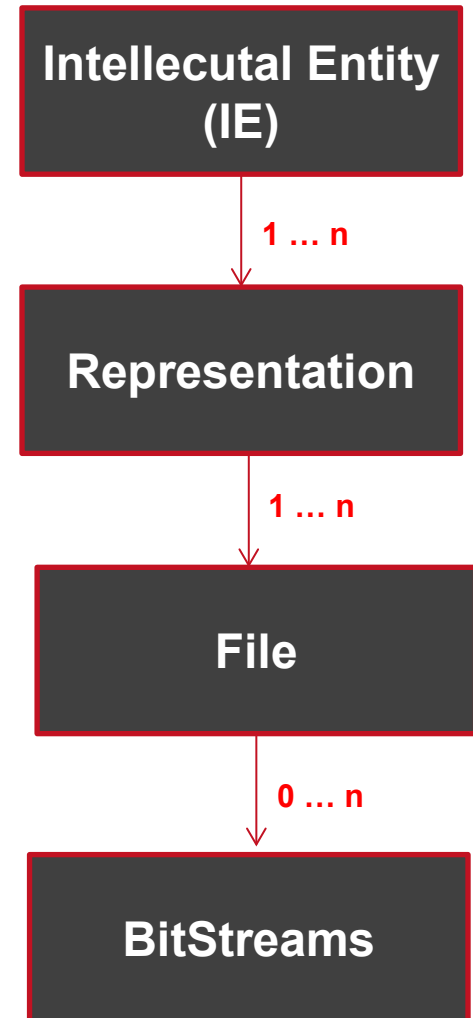


Mapping the Digital: PREMIS

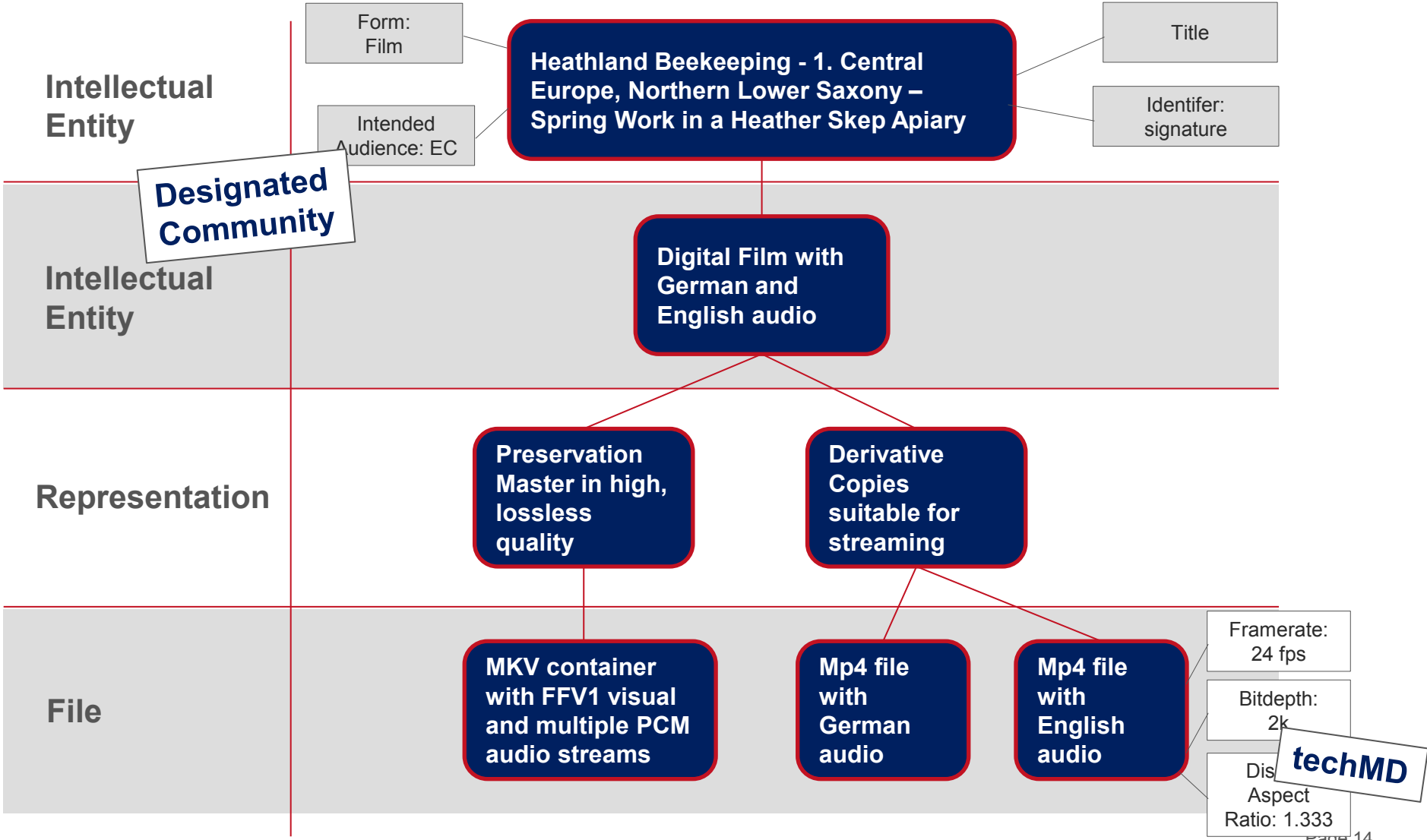
- TIB's Digital Archive is built around Rosetta
- Rosetta implements PREMIS with all levels of the entity OBJECT
- TIB has adopted the object levels Intellectual Entity, Representation and File for all processes relating to the Digital Archive
- AV use case could be extended to capture information at BitStream level as well (i.e., essence such as „audio“ and „video“), however in practical use this is captured at the container level

For more information on TIB's use of PREMIS, see:

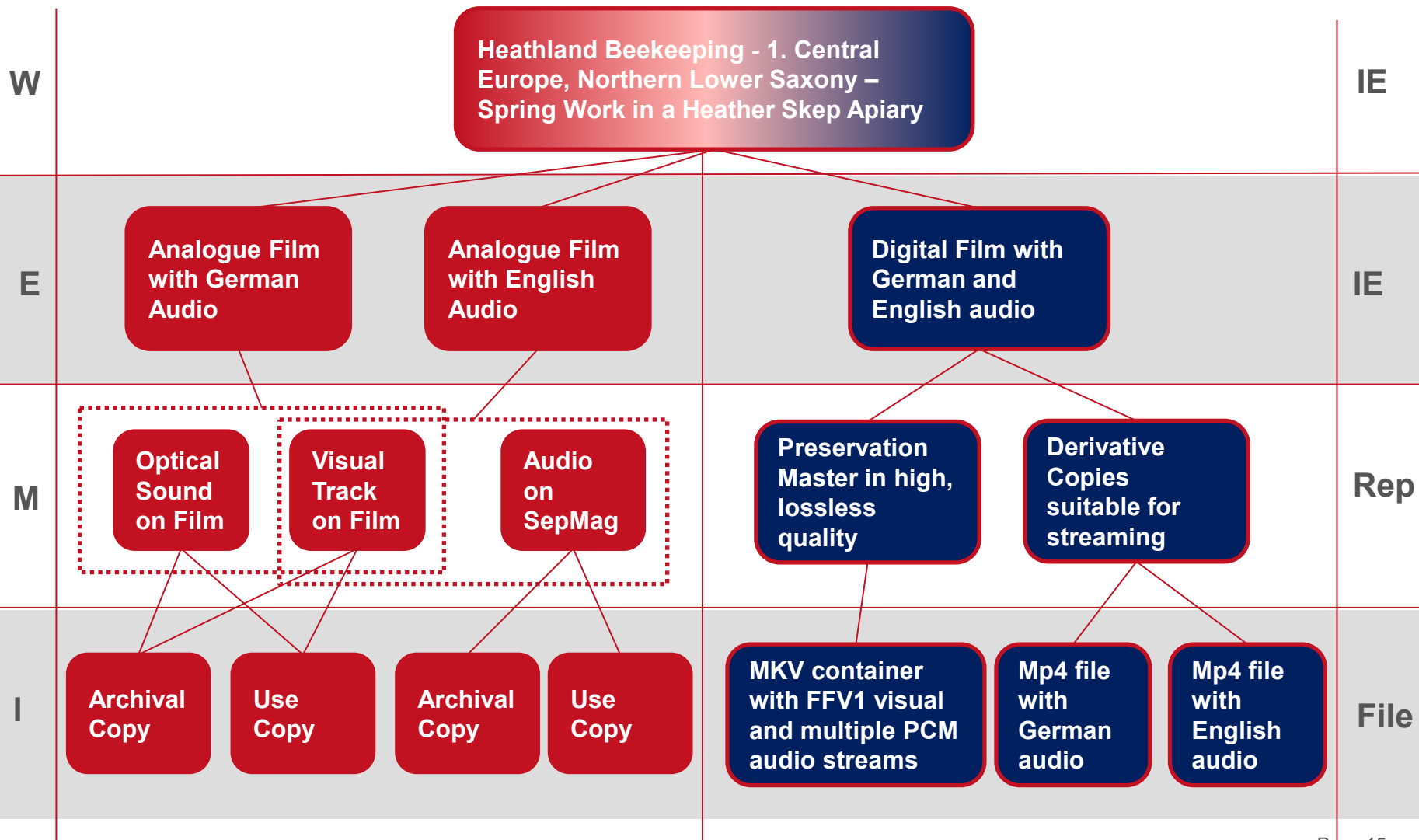
<https://wiki.tib.eu/confluence/pages/viewpage.action?pageId=93608990>



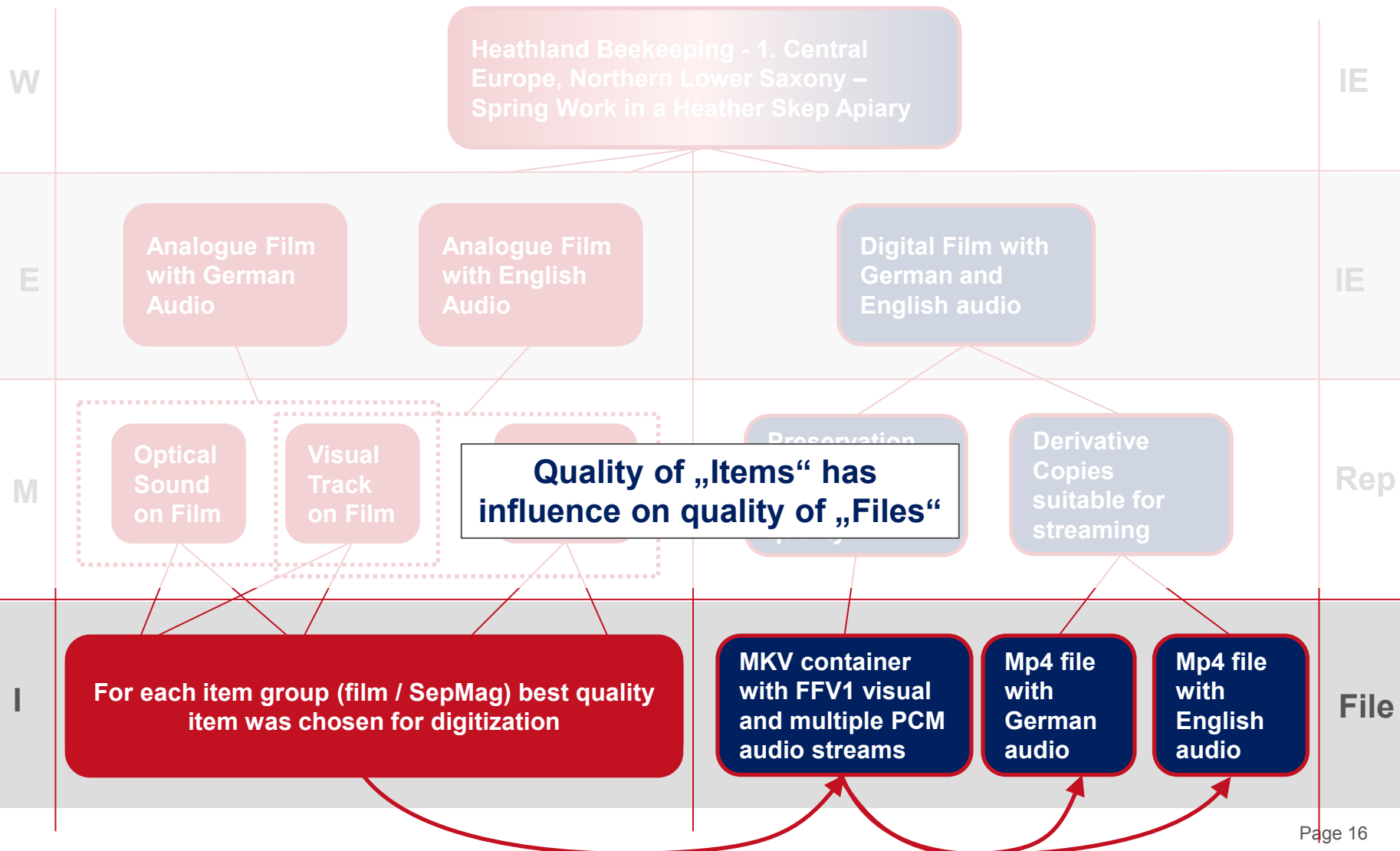
A digital view – DELFT objects in PREMIS



Mapping Analogue to Digital AV



Mapping Analogue to Digital AV



Towards a Metadata Schema

Design goals:

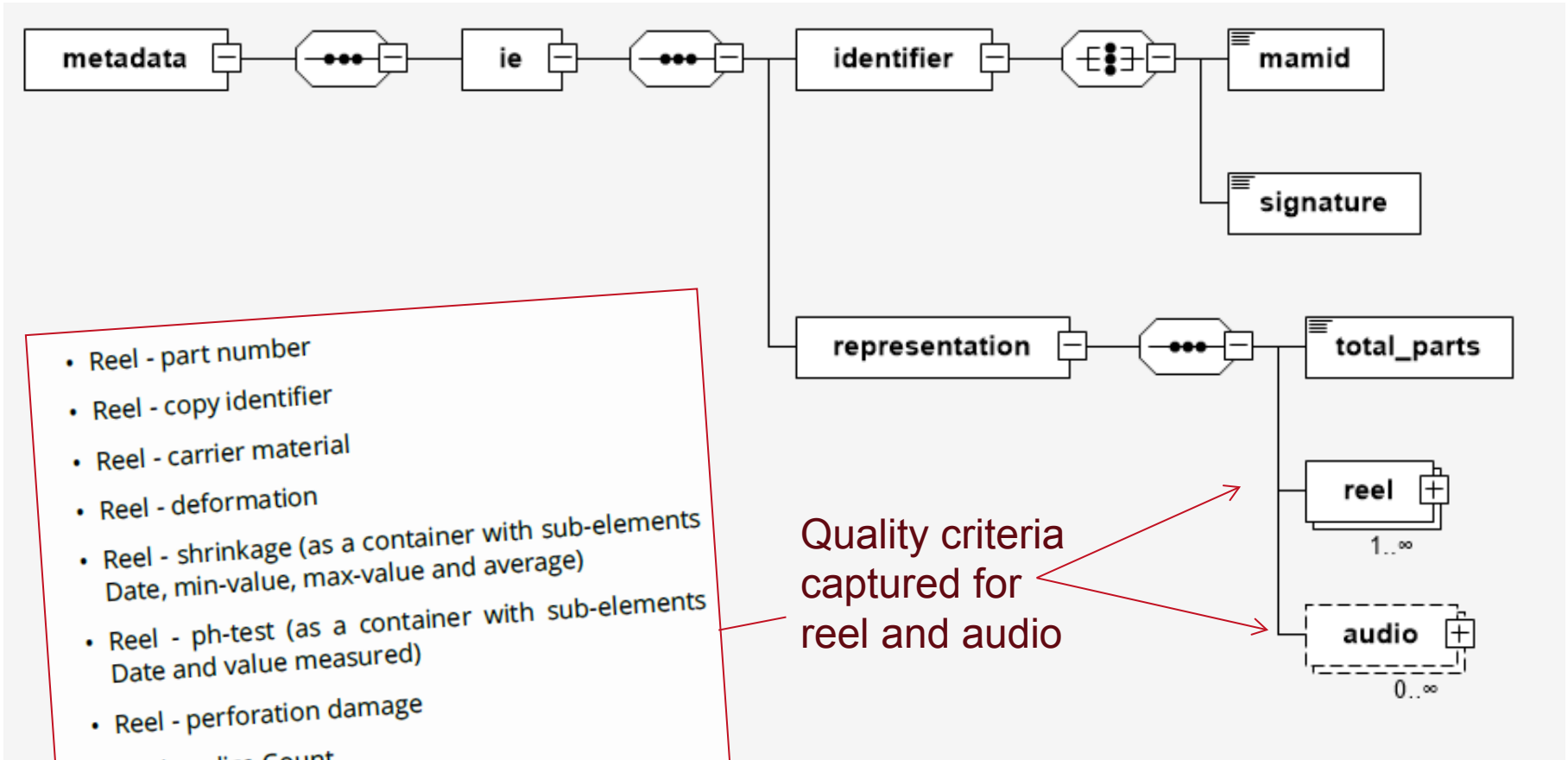
- Cover all criteria identified by conservator
- Capture in structured, machine- and human-readable form
- Apply controlled values / vocabularies where possible
- Structure information in a way that makes it understandable in a digital object's context
- Keep it light-weight and extendable
- Provide information in German & English language to allow for community re-use and feedback

	H	I	J	K	L	M	N	O	P	
1	Menge	Kopie:	Träger	Schrur	Schrur	Schrur	Schrur	Essigsy	Essigsy	Per
2	1	VK 2B	Azetat	10.03.2020	-0,874855	-1,23793	-1,0106742	nicht getest	nicht getest	nein
3	1	AK	Azetat	17.02.2020	-0,967216	-1,1392	-1,0326196	nicht getest	nicht getest	nein
4	1	AK	Azetat	17.02.2020	-0,792053	-1,07231	-0,9036792	nicht getest	nicht getest	nein
5	1	AK	Azetat	17.02.2020	-0,553192	-1,05639	-0,6625638	nicht getest	nicht getest	nein
6	1	AK	Azetat	17.02.2020	-0,811157	-1,11372	-0,9537919	nicht getest	nicht getest	nein
7	1	VK 1B	Azetat	17.02.2020	-0,93856	-1,08505	-1,0056808	nicht getest	nicht getest	nein
8	1	VK 2B	Azetat	17.02.2020	-0,90033	-1,25703	-1,0547136	nicht getest	nicht getest	nein
9	1	AK						nicht getest	nicht getest	nein
10	1	AK						nicht getest	nicht getest	nein
11	1	AK						nicht getest	nicht getest	nein
12	1	VK 1B						nicht getest	nicht getest	nein
13	1	AK						nicht getest	nicht getest	nein
14	1	AK						nicht getest	nicht getest	nein
15	1	AK						nicht getest	nicht getest	nein
16	1	AK						nicht getest	nicht getest	nein
17	1	AK						nicht getest	nicht getest	nein
18	1	AK	Azetat	17.12.2019	-0,713882	-0,783941	-0,7422753	nicht getest	nicht getest	nein
19	1	AK	Azetat	17.12.2019	-0,315782	-0,713882	-0,5253296	nicht getest	nicht getest	nein
20	1	AK	Azetat	17.12.2019	-0,417694	-0,586495	-0,5155713	nicht getest	nicht getest	nein
21	1	AK	Azetat	10.03.2020	-0,629631	-0,823906	-0,7848418	nicht getest	nicht getest	nein
22	1	AK	Azetat	17.12.2019	-0,439987	-0,548264	-0,5165861	nicht getest	nicht getest	nein
23	1	AK	Azetat	17.12.2019	-0,455913	-0,538716	-0,4983212	nicht getest	nicht getest	nein

To get from here ...



Main Entity View of Metadata Schema

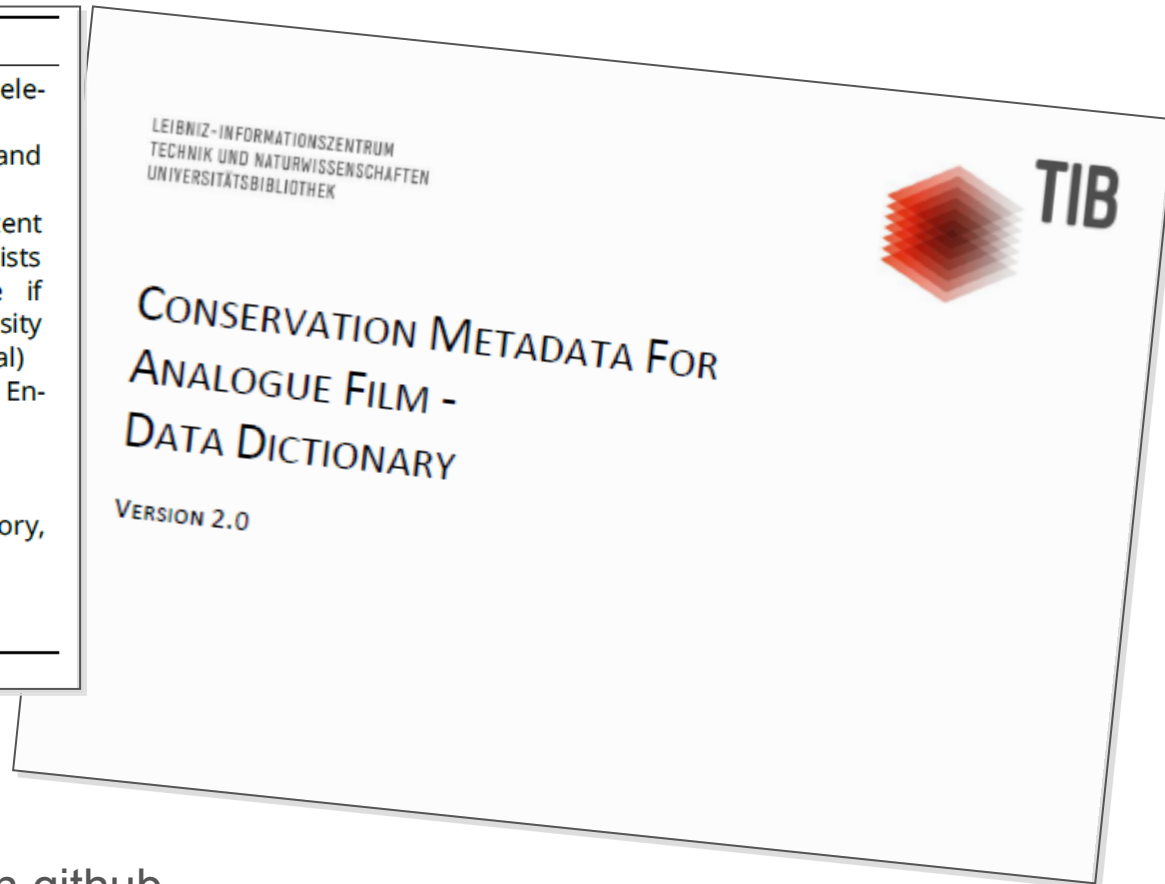


- Reel - part number
- Reel - copy identifier
- Reel - carrier material
- Reel - deformation
- Reel - shrinkage (as a container with sub-elements Date, min-value, max-value and average)
- Reel - ph-test (as a container with sub-elements Date and value measured)
- Reel - perforation damage
- Reel - splice Count
- Audio - audio stream number
- Audio - signal base

Quality criteria captured for reel and audio

Data Dictionary as Key Documentation

Name	Content Description
rationale	Why is there a need for the element?
diagram	A diagram of the element and sub-elements
properties	Cardinality (if defined), content (complex if element consists of child elements, simple if no child elements), necessity (mandatory, required, optional)
annotation	Annotations in German and English
children	Child elements
attributes	Attributes, their type and necessity (mandatory, required, optional)
source	Section of the xsd-schema
example in XML	Example



Data dictionary and xsd on github.

Feedback highly welcome !!

<https://github.com/TIB-Digital-Preservation/FilmConservationMetadata>

Conclusion and Outlook

Benefits we see:

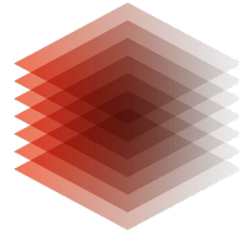
- Contextualization of anomalies during playback of digital („digital remembering analogue“)
- Informing overarching analogue & digital preservation strategy („digital knowing analogue“)
- Decision criteria for digitization & preservation in collaborative environments

Outlook:

- Extending to cover DigiBeta / VHS
- Thinking about where to capture this in PREMIS data dictionary terms
- Incorporating feedback from YOU ;-)



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Thank you!
Questions? Comments!

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Lindlarm



mickylindlar



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Further Information about DELFT / AV preservation at TIB

TIB Conservation Metadata Schema Documentation (in English):

<https://github.com/TIB-Digital-Preservation/FilmConservationMetadata>

DELFT Project Information (in German):

<https://projects.tib.eu/delft>

Digitization Parameters for AV (in English):

<https://wiki.tib.eu/confluence/display/lza/Digitization+of+AV-Material%3A+Extent+and+parameters>

Building upon Open Tools – Extending the Quality Control for Digitized Audio-Visual Material with QCTools Version 1.2 (in English):

<https://openpreservation.org/blogs/building-upon-open-tools-extending-the-quality-control-for-digitized-audio-visual-material-with-qctools-version-1-2/?q=434>

„Project DELFT: Digitizing Ethnological Films“ – Presentation at No Time To Wait 3

<https://www.youtube.com/watch?v=W7IDluUwvWM>