DIGITAL - Institute for Information and Communication Technologies

Metadata Mapping and Validation Tools - Werner Bailer
Video Quality Assessment Tools - Peter Schallauer

PrestoCentre Workshop @ Pasig, 18th October 2012, Dublin
Metadata mapping and validation – Why?

- Metadata mapping (conversion, cross-walk)
  - translate elements from one metadata format/standard to another
  - with as little loss of semantics as possible
  - exchange metadata between systems, institutions, …

- Metadata validation
  - ensure syntactic and semantic conformance of a metadata document to a (formal or informal) definition or standard
  - exchange metadata between systems, institutions, …

- interoperable metadata for audiovisual content
Where are we on the OAIS map?

Legacy format to SIP supported
SIP sourceMD to AIP format
extracted technical metadata to AIP format
to desired delivery format
to production/distribution system
update metadata (e.g. user annotations)
validate
map
Ingest

MANAGEMENT
Metadata Mapping

- avoid hand-crafted 1:1 mappings between metadata formats
- use a high-level intermediate concept representation
- infer relations between concepts in source and target formats
- visualisation of inferred mappings
Metadata Mapping Service

**Semantic Converter**

Input format:
- Dublin Core
- MPEG-7
- W3C MA
- PREMA

Output format:
- Dublin Core
- MPEG-7
- W3C MA
- PREMA

Convert from MPEG-7 to Dublin Core

```
<name>
<type>
<ref>
<creator>
<role/>
<Agent>
</PersonType/>
</tag>
</creator>
</name>
</element>
```

**Steps:**
1. Create firing templates based on ontology:

```
<xsi:template match="/mpeg7:Creator/mpeg7:Role[definition="/mpeg7:Agent[@xsi:type='PersonType']/"
   xsi:call-template name="/mpeg7:PersonType_TaggedText">
    <xsi:with-param name="tag">dc:creator</xsi:with-param>
    <xsi:call-template>
    </xsi:call-template>
</xsi:template>
```

```
<xsi:template match="/mpeg7:Creator/mpeg7:Role[definition="/mpeg7:Agent[@xsi:type='OrganizationType']/"
   xsi:call-template name="/mpeg7:OrganizationType_TaggedText">
    <xsi:call-template>
    </xsi:call-template>
```

**INPUT**

**OUTPUT**
Configuring Metadata Mapping

- Select from a set of existing mappings
- Add/modify relations between metadata elements
  - e.g. dc:title <-> mpeg7:Creation/mpeg7:Title
- Add/modify constraints on relations between metadata element
  - e.g. subtitle as specialisation of title
- Preview consequences for a certain source-target pair (cf. mapping visualisation)
- Select/configure datatype mappings
  - e.g. structured person name format to string
Configuring Metadata Mapping: Workflow

- Establish relations between format and intermediate ontology
  - Start from existing mapping, schema or example set
  - Relate single/multiple properties in source/intermediate format
  - Select/refine data types
  - Define conditions/rules

- Select source-target format pair
  - Preview consequences of mapping definitions
  - Datatype mappings are preselected, modify, refine
  - Generate conversion script
Configuring Metadata Mapping

### Metadata Conversion Configuration Tool 0.7.9

#### Project: bawtest2

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<thead>
<tr>
<th>(Costs 201)</th>
<th>Creator</th>
<th>Actor</th>
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<td>(Costs 201)</td>
<td>Creator</td>
<td>Writer</td>
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validate metadata documents, not only syntactically, but also semantically

- ensure validity and completeness at ingest and export
- prevent interoperability problems
- support of MPEG-7 profiles
  - Detailed Audiovisual Profile (DAVP), PrestoSpace
  - Audiovisual Description Profile (AVDP), for automated metadata extraction in broadcast production (EBU ECM SCAIE)
Metadata Validation Workflow
Demos at http://prestoprime.joanneum.at

- Mapping Service
- Mapping Configuration Tool
- Validation Service
Video and Movie Content Quality Assessment Tools for File Based Preservation

Peter Schallauer

PrestoCentre Workshop @ Pasig, 18th October 2012, Dublin
File quality checking
Focus on content based (base band)

- File integrity
- Wrapper (MXF, MOV, AVI) standards compliance
- Stream (MPEG, ...) standards compliance
- **Content based (base band, essence)** visual quality assessment
  - Analysis of raw image data – independent of encoding
  - Film and video degradations
  - Analogue and digitally born
  - Any generation
  - Reference-free
Content quality checking
Archive related use cases

Content Ingest/Migration
- to monitor if the video player shows problems (head clog, drop-out, video breakup, off-lock, …)
- to monitor the scanning process (instability, out of focus, white/black point, …)
- to ingest only high quality content (no up-scaled one, …)
- to check the encoding/transcoding (blocking, sharpness, …)

Content Selection/Access/Usage
- to select my ‘best quality copy’
- to search for a video with minimum quality for a certain usage
  - noise reduction necessary?
  - Sharpness high enough?

Restoration Planning
- Cost estimation
- Tools/System selection
Automation of content checking

- **Fully manual**
  - Highest quality, extremely expensive

- **Fully automatic**
  - Limited functionality, very cheap

- **Automatic analysis + Human verified**
  - Best compromise between both

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Tools: Automatic Quality Analysis

- VidiCert Analyser
  - File based import
  - Analysis profiles
  - Detectors
    - Video Breakup
    - Noise/Grain
    - Uniform Colour
    - Test Pattern
    - Sharpness
  - Standard compliant, temporally dense quality description
Tools: Interactive Quality Verification

- VidiCert Summary
  - Defects visualisation and navigation
    - Timeline based and event based
  - Efficient human verification
    - Severity based
VidiCert Summary
Standardisation Initiatives relevant for Video Quality

- MPEG-7 Audiovisual Description Profile (AVDP)
  - Tailored to media production and archiving applications
  - Standardised by ISO in 2012
  - Joint work of EBU, NHK, RAI, VRT, JRS
  - Allows metadata interoperability between AIE tools and systems

- MPEG Multimedia Preservation Description Information (MPDI)
  - Metadata for multimedia preservation, including quality of content
  - PrestoPRIME and TOSCA-MP projects submitted proposal for extending MPEG-7 with visual quality descriptors (general framework, specific visual quality descriptors, classification scheme)

- EBU/AMWA Framework for Interoperable Media Services (FIMS)
  - Standardising interfaces for SOA in media production
  - FIMS Business Board defining requirements and charter for technical group on Quality Analysis Services
Summary on Video Quality Assessment

- AV archive processes (ingest, migration, access) can benefit from content based video/movie quality assessment
- Automation of QC is essential to reduce costs
- Reliable automatic detector algorithms are required
  - Video Breakup, Noise/Grain Level, Test Pattern, Sharpness
- VidiCert Summary
  - Timeline based and event based visualization and navigation
  - Efficient human verification by severity
- More at www.vidicert.com
Thank you for your attention!

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