The ISO Metadata Standard MLR for Learning Resources
@ The EdReNe Strategic Seminar in Lisbon, Portugal

Christian M. Stracke (eLC / University of Duisburg-Essen, Germany)
Chair CEN TC 353 and ISO-Convener SC36 for QM & QA
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Christian M. Stracke

About the author

- Assistant Prof., University of Duisburg-Essen <www.wip.uni-due.de>
- Adjunct Prof., Korea National Open University <www.knou.ac.kr>
- Convener of the international ISO standardization committee
  SC36 WG5 "Quality Assurance and Descriptive Frameworks"<www.iso.org/jtc1/sc36>
- Chair of the European standardization committee
  CEN/TC 353 "IT for Learning, Education, and Training"
  <www.cen.eu/issss/TC_353>
- German E-Learning Association D-ELAN: Board of Directors
  <www.d-elan.net>
- eLC - European Institute for Learning, Innovation and Cooperation,
  Director and Founder, Bonn (Germany) <www.elc-institute.org>
- Expert for: E-Learning, Quality, Competences, Standardization, HR
Where is Essen? Just in the Center of Europe!
Where is Essen? Just in the Center of Europe!
University of Duisburg-Essen - What are we doing?

- QM + Evaluation
- International + European Standardization
- HR
- VET +LLL
- K-12 + HE
- e-Learning
- Competences
TELIT: Institute for Technology-Enhanced Learning, Quality and Innovations in LET

Exclusive Partner of SAP worldwide (ERP4students)
Official Certifications in > 30 countries

2 - 3 Mio. incoming budgets / year

> 15 international and EU projects in parallel

Chairing ISO-committee SC36 WG5 + CEN TC 353

www.wip.uni-due.de/research
Quality matters for us!
Quality
most important
for Learning, Education and Training!
Our main successes:

PAS 1032-1 = German QM standard
QSEL = Quality Mark E-Learning
QPL = Quality Platform Learning
Q.E.D. = largest QM & E-Learning project
RFDQ = 1. ISO QM standard for LET
Projects for Competence Modelling:
1. WACOM
2. eCOTOOL
3. COMPAT
4. AGRICOM
and many more...

www.wacom-project.eu
www.ecompetence.eu
www.compategov.eu
www.agriculture-competence.eu
www.qualitydevelopment.eu
Projects for Quality in (E-)Learning:

1. Q-Cert-VET
2. OERTest
3. SIMBASE
4. VOA3R

and many more...

www.edu-certification.eu
www.oer-europe.net
www.simbase.co
www.voa3r.eu

www.qualitydevelopment.eu
Projects for large scale (E-)Learning:

1. ARISTOTELE: Work-place learning + HRD
2. ODS E-Learning for 2,000 Schools

and many more...

www.aristotele-ip.eu
www.opendiscoveryspace.eu
www.qualitydevelopment.eu
Quality Standards

support
development + design + realization + evaluation

for

best learning outcomes!
European Quality Standards for LET
Leading international standardization organization in the field of information technologies for learning, education, and training.

Established 2000-03 in London (UK), current status: 7 WGs and participation by >60 National Bodies + >30 Liaisons Organizations from all five continents, bi-annual plenaries around the world.

More information online:
http://www.iso.org/jtc1/sc36  or:
http://www.sc36.org
Main results of ISO SC36

ISO/IEC 19796-1 "RFDQ"

Metadata for Learning Resources (MLR)
- ISO/IEC 19788 – Metadata for Learning Resources, also Multi-part standard, compliant with Dublin Core (DC), Parts 1 and 2 published now

ISO/IEC ELM "Access4All"
- Multi-part Accessibility Standard for Individualized Adaptability (> 10 Parts) Parts 1 (Framework), 2 (Personal Needs) and 3 (Digital Resources) published now

ISO/IEC 29163 "SCORM"
- Combined Specifications (4 Parts) for Learning Management Systems & Objects
The European de-jure standardization organization in the field of ICT for learning, education, and training (LET)
EN Standards: Obligation to use within European Union

Established 2007-05 in Milan (Italy), current status: 2 WGs and participation by > 30 National Delegations and > 60 Experts, bi-annual plenaries across whole Europe

More information online:
http://www.cen.eu/iss/TC_353
Main results of CEN TC 353

EN ISO/IEC 19796-1:
- First EN Quality Standard for ITLET including the reference process model "RFDQ" (published as EN in 2009 by 100% adoption of ISO/IEC 19796-1)

Metadata for Learning Opportunities
- "MLO - Advertising": First part of multi-part standard for Metadata, compatible to DC, MLR, CDM, XCRI and PAS 1068 (published in 2010)

ELM "European Learner Mobility"
- Multi-part Framework for the harmonization of European Policies (EQF, Europass, ECTS, ECVET), first part for Europass + ECTS (published in 2010)

CEF "Curriculum Exchange Format"
- Information model & vocabulary bank for Curricula exchange
1. EN + ISO Quality standard:

**EN ISO/IEC 19796-1**

unique QM standard for LET

adapted & used worldwide in

> 60 countries (also EU, RF + China)!
1. EN + ISO Quality standard:

EN ISO/IEC 19796-1
- developed by ISO committee SC36 WG5
- focus on process, product and potential
- includes reference process model
- multi-part QM standard
- based on German PAS 1032-1
- Co-Authors: Christian M. Stracke et al.

Learn from your e-mistakes...
### Unique ISO QM standard ISO/IEC 19796-1

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>Analysis of the external context</td>
<td>Learning objectives</td>
<td>Content realization</td>
<td>Testing of learning resources</td>
<td>Administration</td>
<td>Planning</td>
</tr>
<tr>
<td>Stakeholder identification</td>
<td>Analysis of staff resources</td>
<td>Concept for contents</td>
<td>Design realization</td>
<td>Adaptation of learning resources</td>
<td>Activities</td>
<td>Realization</td>
</tr>
<tr>
<td>Definition of objectives</td>
<td>Analysis of target groups</td>
<td>Didactical concept/ methods</td>
<td>Media realization</td>
<td>Activation of learning resources</td>
<td>Review of competencies levels</td>
<td>Analysis</td>
</tr>
<tr>
<td>Demand analysis</td>
<td>Analysis of the institutional and organizational context</td>
<td>Roles and activities</td>
<td>Technical realization</td>
<td>Organization of use</td>
<td>Optimization / improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time and budget planning</td>
<td>Organizational concept</td>
<td>Maintenance</td>
<td>Technical infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environment analysis</td>
<td>Technical concept</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activities**
- Organization of use
- Activation of learning resources
- Adaptation of learning resources
- Technical infrastructure
- Analysis of target groups
- Analysis of the institutional and organizational context
- Organization of media and interaction design
- Media Concept
- Communication concept
- Concept for tests and evaluation
- Concept for maintenance

**Analysis**
- Environment analysis
- Time and budget planning
- Analysis of staff resources
- Analysis of target groups
- Analysis of the external context
- Analysis of the institutional and organizational context

**Planning**
- Administration
- Activities
- Review of competencies levels

**Optimization / improvement**
- Technical infrastructure
- Concept for tests and evaluation
- Communication concept
- Media Concept
- Organization of use

**Optimization / improvement**
- Organization of media and interaction design
- Media Concept
- Communication concept
- Concept for tests and evaluation
- Concept for maintenance

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The ISO Metadata Standard MLR for Learning Resources
@ The EdReNe Strategic Seminar in Lisbon, Portugal, 2012-05-07
Christian M. Stracke, eLC / University of Duisburg-Essen - slide 22
ISO/IEC 36000: General Framework (Information about Elements + Process Model + viewpoint)

ISO/IEC 36001: Quality Model for organizations (intended for certification)
(Requirements for organizations including process-related requirements)

ISO/IEC 3600x: Quality Model for products (intended for certification)
(Requirements for products)

Part 1: General Framework (+ Description Model + Processes)
Part 2: Quality Model (+ Processes)
Part 3: Methods and Metrics
Part 4: Good Practice Cases
Part 6: Conformity Assessment Model
New Metadata standard:

ISO/IEC 19788-1 "MLR"

approved and published now!
ISO/IEC 19788

Multi-part ISO Metadata Standard

Unique ISO Metadata standard to be used in all IT systems & branches by adaptations

Defining rules sets, UIDs and templates

Based on Dublin Core (100% compliant) to keep international consensus & acceptance
## Chapter 6.3

### Categories for Metadata and their Attributes

<table>
<thead>
<tr>
<th>Data element specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier (mandatory)</td>
</tr>
<tr>
<td><strong>Data element attributes</strong></td>
</tr>
<tr>
<td>Property name (mandatory)</td>
</tr>
<tr>
<td>Definition (mandatory)</td>
</tr>
<tr>
<td>Linguistic indicator (mandatory)</td>
</tr>
<tr>
<td>Domain (mandatory)</td>
</tr>
<tr>
<td>Range (mandatory)</td>
</tr>
<tr>
<td>Content value rules (conditional)</td>
</tr>
<tr>
<td>Refines (conditional)</td>
</tr>
<tr>
<td>Example(s) (optional)</td>
</tr>
<tr>
<td>Note(s) (optional)</td>
</tr>
</tbody>
</table>
### MLR Data Element Specification

**Example 1:**

<table>
<thead>
<tr>
<th>Data element specification</th>
<th>Chapter 6.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier (mandatory)</td>
<td>ISO_IEC_19788-3:2010::DES0300</td>
</tr>
<tr>
<td><strong>Data element attributes</strong></td>
<td></td>
</tr>
<tr>
<td>Property name (mandatory)</td>
<td>format (eng)</td>
</tr>
<tr>
<td>Definition (mandatory)</td>
<td>file format of the learning resource (eng)</td>
</tr>
<tr>
<td>Linguistic indicator (mandatory)</td>
<td>non-linguistic</td>
</tr>
<tr>
<td>Domain (mandatory)</td>
<td>Learning Resource (ISO_IEC_19788-1:2010::RC0002)</td>
</tr>
<tr>
<td>Range (mandatory)</td>
<td>literal</td>
</tr>
<tr>
<td>Content value rules (conditional)</td>
<td>RS_DES0300</td>
</tr>
<tr>
<td>Refines (conditional)</td>
<td>ISO_IEC_19788-2:2010::DES0900</td>
</tr>
<tr>
<td>Example(s) (optional)</td>
<td>video/mpeg text/html</td>
</tr>
<tr>
<td>Note(s) (optional)</td>
<td>-</td>
</tr>
</tbody>
</table>
### MLR Data Element Specification

**Example 2:**

<table>
<thead>
<tr>
<th>Data element specification ID</th>
<th>ISO_IEC_19788-2:2010::DES0300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>urn:ISBN:978-1-4000-1952-6</td>
</tr>
<tr>
<td>Content Value</td>
<td>Fodor’s New Zealand 2009</td>
</tr>
<tr>
<td>Language Code</td>
<td>eng</td>
</tr>
</tbody>
</table>

**Example 3:**

*Example 3 (same as example 1, but expressed in RDF)*

<table>
<thead>
<tr>
<th>Predicate</th>
<th>ISO_IEC_19788-2:2010::DES0020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>urn:ISBN:978-1-4000-1952-6</td>
</tr>
<tr>
<td>Object</td>
<td>“Fodor’s New Zealand 2009”@eng</td>
</tr>
</tbody>
</table>
### ISO/IEC 19788-1 MLR

**Chapter 9.4**

<table>
<thead>
<tr>
<th>Rule_ID</th>
<th>Rule statement / Example(s) &amp; Note(s)</th>
</tr>
</thead>
</table>
| 01      | A **string** constructed according to "ISO 8601:2004 (E) Data elements and interchange formats - Information interchange - Representation of dates and times" (subclause 4.1 Date, subclause 4.2 Time of day, and subclause 4.3 Date and time of day)  
**NOTE** Both the basic format and the extended format may be used.  
**EXAMPLE 1** 1985-04-12T10:15  
**EXAMPLE 2** 1985-W15-5T10:15+04  
**EXAMPLE 3** 1985W155T1015+0400 |
| 02      | Meaning is provided by ISO 8601:2004 |
## ISO/IEC 19788-1 MLR

### Chapter 11.4.2

<table>
<thead>
<tr>
<th>Data element group specification</th>
<th>ISO/IEC 19788-3:2010::DEGS0001</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identifier (mandatory)</strong></td>
<td></td>
</tr>
<tr>
<td>(DEGS_Identifier)</td>
<td></td>
</tr>
<tr>
<td><strong>Name (ISO English) (mandatory)</strong></td>
<td>MLR basic DESG</td>
</tr>
<tr>
<td><strong>Description (mandatory)</strong></td>
<td>MLR entry level element set, based on most commonly used elements in LOM repositories</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position</th>
<th>DES_Identifier/DEGS_Identifier</th>
<th>Name (ISO English)</th>
<th>Presence Type indicator</th>
<th>Repeability indicator</th>
<th>Order indicator</th>
<th>Order semantic</th>
</tr>
</thead>
<tbody>
<tr>
<td>(01)</td>
<td>ISO_IEC_19788-2:2010::DESO100</td>
<td>title</td>
<td>mandatory</td>
<td>non repeatable</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(02)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(03)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(04)</td>
<td></td>
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<tr>
<td>(05)</td>
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<tr>
<td>(06)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>(07)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>ISO_IEC_19788-2:2010::DESO200</td>
<td>creator</td>
<td>conditional</td>
<td>repeatable</td>
<td>ordered</td>
<td>In order of importance, most important first</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ISO_IEC_19788-2:2010::DESO000</td>
<td>subject</td>
<td>conditional</td>
<td>repeatable</td>
<td>ordered</td>
<td>In order of importance, most important first</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ISO/IEC 19788-1 MLR

**Chapter 12.5**

<table>
<thead>
<tr>
<th>Application profile specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identifier (mandatory)</strong></td>
</tr>
<tr>
<td>(AP-Identifier)</td>
</tr>
<tr>
<td><strong>Name (ISO English) (mandatory)</strong></td>
</tr>
<tr>
<td><strong>Description (mandatory)</strong></td>
</tr>
<tr>
<td><strong>Underlying data element group specification (mandatory)</strong></td>
</tr>
</tbody>
</table>
### Annex A.1

#### A.1 Consolidated list of ISO/IEC 19788-1 terms and definitions in ISO French

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1 application profile</strong></td>
<td>defined structured collection of data element specifications (3.14) chosen to satisfy the particular needs of a community or communities. NOTE The data element specifications are from the various parts of ISO/IEC 19788 and from other sources.</td>
<td><strong>profil d’application</strong></td>
<td>collection structurée de spécifications d’éléments de données (3.14) choisies pour répondre aux besoins particuliers d’une communauté ou d’un ensemble de communautés. NOTE Les spécifications d’éléments de données proviennent de diverses parties de la norme ISO/CEI 19788 et d’autres sources.</td>
</tr>
<tr>
<td><strong>3.2 application profile record</strong></td>
<td>specified set of data elements (3.11) describing a specific learning resource (3.20) and obeying the rules (3.32) of a specific application profile (3.1)</td>
<td><strong>enregistrement relatif à un profil d’application</strong></td>
<td>Ensemble d’éléments de données (3.11) décrivant une ressource pédagogique (3.20) et respectant les règles (3.32) d’un profil d’application (3.1) particulier</td>
</tr>
</tbody>
</table>
### Annex A.2

#### A.2 Consolidated list of ISO/IEC 19788-1 terms and definitions in Chinese

<table>
<thead>
<tr>
<th>Identification</th>
<th>ISO English Language</th>
<th>Chinese Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>Definition</td>
<td>Term</td>
</tr>
<tr>
<td><strong>3.1</strong></td>
<td>application profile defined structured collection of data element specifications</td>
<td>应用纲要</td>
</tr>
<tr>
<td></td>
<td>(3.14) chosen to satisfy the particular needs of a community or communities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTE The data element specifications are from the various parts of ISO/IEC 19788 and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>from other sources.</td>
<td></td>
</tr>
<tr>
<td><strong>3.2</strong></td>
<td>application profile record Specified set of data elements (3.11) describing a specific learning resource (3.20) and obeying the rules (3.32) of a specific application profile (3.1)</td>
<td>应用纲要记录</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Basic MLR

MLR

(Slide by Gilles Gauthier: SC36 WG4 Convener)
“Classical” Data Elements

MLR

(Slide by Gilles Gauthier: SC36 WG4 Convener)
The ISO Metadata Standard MLR for Learning Resources
@ The EdReNe Strategic Seminar in Lisbon, Portugal, 2012-05-07
Christian M. Stracke, eLC / University of Duisburg-Essen - slide 36

The New Frontier*

MLR

(Slide by Gilles Gauthier: SC36 WG4 Convener)

* Parts provided as examples, no WG decisions made yet concerning those future parts. The frontier is to be explored!
1st European Conference LINQ 2012
Learning Innovations & Quality: How do they fit together? Lifelong & E-Learning, HRD, Social Communities & Media
Brussels, 2012-10-23 (conjugted with CEN TC 353 Plenary)
Call for papers open! See www.learning-innovations.eu
QLET - Quality for LET: www.qualitydevelopment.eu
References for further information and literature


References for further information and literature


Thank you very much for your attention!

Your Questions?

- Contact:

  Christian M. Stracke
  christian.stracke@icb.uni-due.de

  ISO Convener SC36 WG5 for QM
  Chair CEN TC 353 "ICT for LET"

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