



Efest, 2007: Metadata.OER June, 2007

Metadata decision for the OER Project  
2 May, 2007

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## 1. Purpose

The purpose of this paper is to explain the background and rationale behind the metadata approach within the OER project and to establish an agreed methodology and process for the use of metadata to support learning material retrieval, sharing and dissemination.

## 2. Background

The packaging of material for the OER project prompted discussions about which metadata formats to use, how to apply them and the most efficient way to package the material.

The needs were:

1. Each html page required metadata tags
2. Each learning object required a set of data
3. A consistent approach used throughout the project
4. Timeliness: we had seven weeks to package and deliver the material for the project so needed to make an effective decision quickly.

## 3. Previous work

Previous discussions about metadata in the OER project were:

- A paper called 'Metadata issues' by Jerome DiPietro which outlined possible metadata models based on a précis of the three papers:

[The JORUM Scoping and Technical Appraisal Study Volume V: Metadata](#)

[The UK Learning Object Metadata Core draft 2](#)

[Making Sense of Learning Specifications & Standards \(MASIE Center\)](#)

- A set of metadata attributes used within a header section for each page (text) of instructional design. Developed by Kirsty Leeder (*Appendix 2*) this potentially useful template was not applied consistently by all developers and used a vocabulary for the learning resource element from RDN/LTSN LOM Application Profile <http://www.rdn.ac.uk/publications/rdn-ltsn/types/>

## 4. Information management and technical issues

The application Reload is used to package learning objects. It uses an application metadata profile based on JISC's Centre for Educational Interoperability Standards (CETIS) and the IEEE Standard for Learning Object Metadata.

The comprehensive profile contains some elements that we considered unnecessary for the New Zealand situation, however we wanted to ensure that 'our' metadata allowed for interoperability of content with both a national and an international audience.

Once we had decided on an agreed framework we would need to customise *Reload*.



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## 5. Interoperability

We were keen to ensure that what we developed was interoperable with other New Zealand initiatives, was useful and flexible and so we contacted key staff working on the Open Source Learning Object Repository (OSLOR) project at Wintec - Sarah-Jane Saravani and Troy Williams.

We also had metadata discussions with staff at the Ministry of Education.

## 6. Metadata decisions

### 6.1 Elements

The final list of elements for the OER project, in their categories, is based on the *Reload* list of elements which we believed gave us an internal consistency and an appropriate UK LOM, Version 2.

Our rationale is based on the following:

- *Metadata application profilev5.htm* (Saravani, n.d.) which outlines OSLOR decision to use a metadata profile that uses elements from the Dublin Core-Education Application Profile, EDNA Metadata Standard and UK LOM Core.
- Differences found in a comparison of the categories in Saravani's application profile (n.d) with the Reload default application profile (based on the National Learning Network application profile) list.
- The decision that some metadata fields were unnecessary for our purposes e.g. type, relation, aggregation level.
- The belief that some elements could be deleted if the relevant information was included in another element e.g. relationship could be described in the Description element.

#### *Comparison of metadata elements for OSLOR and OER projects*

OSLOR Project	OER Project
Description Category – An account of the intellectual content of the resource Identifier Title Description Subject Type Relation Classification. Purpose Relation General. Aggregation Level  Instantiation Category – Information identifying one or more instances of the resource Language Format Technical. Format Life Cycle. Version Life Cycle. Status Technical. Size  Contribution Category – Information about contributions to the resource Creator Publisher Date Approver Contributor Annotation. Entity Annotation. Date	General  Identifier Title Language Description Keywords  Life Cycle Version  Contribution: Role Contribution: Date



<p>Contextualisation Category – Information concerning the environment in which the resource is intended to be used</p> <p>Audience</p> <p>Context. Typical Age Range</p> <p>Learning Resource Type</p> <p>Instructional Method</p> <p>Technical. Duration</p> <p>Educational. Description</p> <p>Annotation. Description</p> <p>Access Category – Conditions of use of the resources</p> <p>Rights</p> <p>Technical. Location</p> <p>Technical. Other Platform Requirements</p> <p>Record Category – Description of the record itself</p> <p>Meta-metadata. Identifier. Catalog</p> <p>Meta-metadata. Identifier. Entry</p> <p>Meta-metadata. Metadata Schema</p> <p>Meta-metadata. Contribute. Role</p> <p>Meta-metadata. Contribute. Entity</p> <p>Meta-metadata. Contribute. Date</p>	<p>Technical</p> <p>Format</p> <p>Educational</p> <p>Learning resource type</p> <p>Context</p> <p>Typical age range</p> <p>Typical learning time</p> <p>Description</p> <p>Rights</p> <p>Copyright and other restrictions</p>
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## 6.2 Vocabulary

Choosing the words to describe a resource can be fraught since people will understand and use a resource differently. We were most concerned about vocabularies for the elements: Format, Context, Learning Resource Type and Educational Description because these areas were the most contested.

De Pietro (2006) alludes to the difficulties associated with differing vocabularies and taxonomies and the Metadata Guide (2007) says:

[“Controlled vocabularies](#) for use with metadata elements are not always included in standards and specifications. Where controlled vocabularies are provided for metadata elements, once again the issue of compliance/conformance is clouded. Often they are recommended as “best practice” and are not compulsory, so that individual implementations may choose their own controlled vocabularies. This is often for the best, as it is very difficult to agree on controlled vocabularies to suit every need on an international scale.”

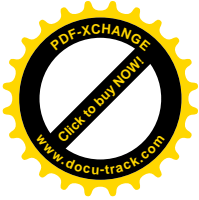
We developed controlled vocabularies for these elements.

### 6.2.1 Format

We chose to retain the *Reload* Format vocabulary. It is used as a basis for development of OSFOR metadata so ensures a degree of interoperability between the two application profiles.

### 6.2.2 Context

We used the NZ Standard Classification of Education (NZSCED) for Context, allowing developers to choose from: Early Childhood, Primary, Secondary and Tertiary. We chose this because we believed it suited the NZ audience but was also able to be applied to the UK and Europe.



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There was also discussion about the inclusion of relationships, and the addition of levels. Accordingly under Context vocabulary we suggested the inclusion of levels e.g. tertiary level 5. We included the vocabulary of the Level based on the NZQA recommendations.

“There are ten levels involved in a qualification - 1 is the least complex and 10 the most. Levels depend on the complexity of learning. They do not equate to 'years spent learning' but reflect the content of the qualification (for more details view the level descriptors). Levels are still being added to some qualifications.”

KiwiQuals (2003-2006).

### 6.2.3 Learning Resource Type

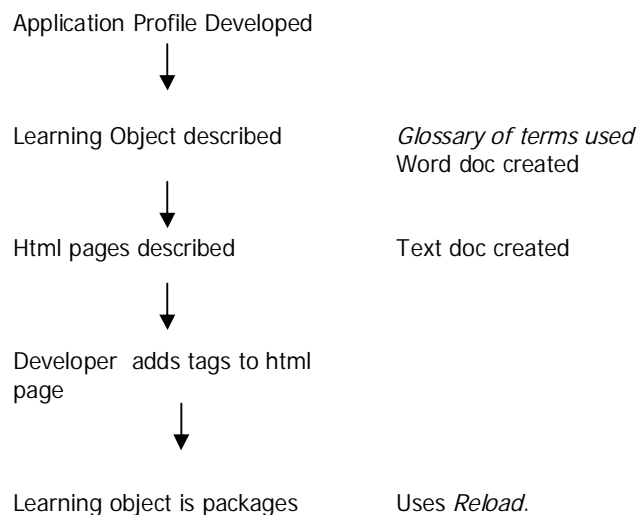
We retained the National Learning Network vocabulary used by *Reload* because it offered us again an internal consistency and was aligned with several other vocabularies. To suit our purposes we added: Case Study, Quiz and Assessment.

[http://www.nln.ac.uk/materials/developers/technical\\_metadata\\_requirement.asp](http://www.nln.ac.uk/materials/developers/technical_metadata_requirement.asp)

## 7. Testing

Learning objects were packaged. We developed metatags for the html pages using text files and used a template to create the tags for the learning objects. This process proved useful.

A hint/help file (“Glossary of terms for metadata”) was developed for the metadata application profile to assist our colleagues and to ensure a degree of internal consistency.



*Diagram showing simplified process for writing and using metadata.*

## 8. Reflection

Having reached the end of the metadata exercise we realised, on reflection, that we had developed a seven-step process that might be useful in any future metadata developments.



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Process	Key questions	Rationale
Content	What are we describing?	function
Purpose	Why do we need to describe it?	usability, interoperability, publication
Tags/elements	What language/categories/terms/elements can we use to describe it?	usability
Models	What models are available to us?	interoperability
Application profile	What is the best application profile for us to develop?	usability, interoperability, parameters
Usage	How can we assist others to use this model	consistency
Packaging	How are we going to package our content?	sharing, interoperability
Publishing	How will the material be published?	process, interoperability, usage

## 9. Recommendations

That decisions about metadata be made earlier in the production cycle allowing instructional designers/developers to add metadata as they write and mark up the pages.

That agreement is reached on NZ Standards and that information is shared amongst the elearning community so that a consistent approach is found.

### Final note

Our thanks to Troy and Sarah-Jane for their generosity in sharing thoughts and ideas with us. We wish to stress that our decision was made in a short timeframe and without extensive research in order to achieve deadlines. We have however tried to maintain an internal consistency and where possible align our decisions to those made by our colleagues at Wintec and on other international projects.

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## References

Clayton, J. (2006). *Describing learning objects: Seeking simple solutions*. TCC 2006 Proceedings.

DePietro, J. (n.d.) *Metadata issues*. A discussion paper for the OER project. The Open Polytechnic of New Zealand.

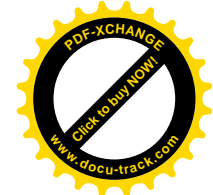
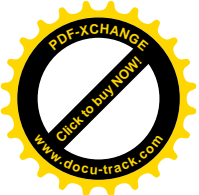
Friesen, N., Mason, J. & Ward, N. (2002). *Building educational metadata application profiles*. Paper presented at Proc. Int. Conf. On Dublin Core and Metadata for e-Communities, 2002: 63-69. Retrieved February 16, 2007 from <http://www.bncf.net/dc2002/program/ft/paper7.pdf>

Garshol, L. M. (2004). *Metadata? Thesauri? Taxonomies? Topic maps? Makings sense of it all*. Retrieved May 1, 2007 from <http://www.ontopia.net/topicmaos/materials/tm-vs-thesauri.html>

KiwiQuals (2003-2006). *About the register. Levels*. Retrieved May 2, 2007 from <http://www.kiwiqual.govt.nz/about/levels/index.html>

*Metadata Guide*. Retrieved February 12, 2007 from <http://metadata.cetis.ac.uk/guides/guide.doc>.

Ministry of Education (2006) *NZSCED broad fields of study*. Retrieved May 2, 2007 from <http://www.minedu.govt.nz/index.cfm?layout=document&documentid=4651&data=1>



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National Learning Network Vocabulary

([http://www.nln.ac.uk/materials/developers/technical\\_metadata\\_requirement.asp](http://www.nln.ac.uk/materials/developers/technical_metadata_requirement.asp))

National Library of New Zealand (2006). *Nga upko tukutuku/Maori subject headings*. Retrieved May 2, 2007 from <http://mshupoko.natlib.govt.nz/mshupoko/>

*Reload IMS LRM Profile Data* Reload Application

Saravani, S-J. (n.d.) *Metadata application profilev5.htm*. Discussion paper for the OSFOR Project.

*UK Learning Object Metadata Core, Draft 0.2 (May 2004)*. Retrieved February 12, 2007 from CETIS, The LOM homepage <http://zope.cetis.ac.uk/profiles/uklomcore>



## Appendices

### 1. Model developed for each html page \*txt file

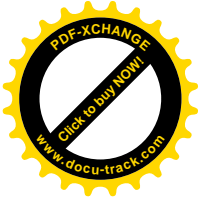
```
<title>Individual Assessment: Ergonomics </title>
<meta name="keywords" content=" OER, open educational resources, free, education, hardware
fundamentals, Diploma in Information and Communications Technology, Level 5, computing, technology
education, assessment, assignment, ergonomics, human interface, health and safety issues, weighting 10%,
learning outcomes"/>
<meta name="description" content="health issues related to day-to-day use of a personal computer.
Students write a report identifying six priority areas of concern from the case study information provided,
and recommend a solution for each." />
<meta name="copyright" content="This resource was created for the NZ OER Project, led by The Open
Polytechnic of New Zealand and is available for re-use under the Creative Commons Attribution-ShareAlike
2.5 License" />
<meta name="author" content="NZ OER Project" />
```

### 2. Glossary of terms for metadata

General		
Identifier:	e.g. 9633-ass-100	Course number, learning object number
Title	Site feasibility assessment	Course module learning object
Language	En	English
Description	Outlines the suggested assessment activities for the NZQA Descriptor 9633 Site Feasibility as part of the National Diploma in Construction Management, Level 5. The four part assessment activities cover how the assessments will occur, what the learners have to do and link to resources. Learners research and gather information and prepare a feasibility report for proposed additions to a house.	Use full sentences. This clearly is very general and open to change depending on the topic. Use this as a guide.  <b>Sentence one:</b> unit descriptor number and name and programme and level details. <b>Sentence two:</b> number of parts, pages description of what happens and any links. <b>Sentence three:</b> what learner has to do.
Keywords	research, assignment, learning outcomes.	Consider what people will want to search and what they hope to find. E.g a report searcher is looking for information about report writing. Always use: open educational resources, and then add in any learning object keywords details. <b>Limit to 8 keywords max.</b>  The keywords you use here will be used in the meta tags for the html pages in the Los.  <b>Note:</b> This data element should not be used for characteristics that can be described by other data elements. <b>Examples</b> The term 'Assessment' is covered in the Learning Resource Type and so it is not necessary to include in keywords.  The term 'OER' is used in the Lifecycle Contribution/V-card element so is not necessary to include in keywords.
Life Cycle		



Version	1.0	Version 1
Contribution: Role	Publisher	
Contribution: Entity( uses v-card system)	ORG: The Open Polytechnic of New Zealand NZ; OER Project	<b>ORG</b> specifies the organizational name and units associated with the vCard. consists of the organization name, followed by one or more levels of organizational unit names. Text components are separated by a semi-colon. E.g. ORG:University of Edinburgh; School of Literatures Languages and Cultures; Celtic and Scottish Studies <a href="http://www.imc.org/pdi/">http://www.imc.org/pdi/</a>
Contribution: Date	2007-05-20	the date of publication of the learning object. Date must be recorded in ISO 8601:2000 format e.g. YYYY-MM-DD. If the exact date is not know the first day of the month may be substituted e.g. YYYY-MM-01.
Technical		
Format	Text/html	<b>Use the dominant format</b>  <b>Chose from:</b> Application/excel Application/mspowerpoint/application/msword Application/pdf Application/x-javascript Application/x-troff-msvideo Application/x-shockwave-flash Application/x-compressed Application/x-zip-compressed Application/zip Audio/aiff Audio/x-aiff Audio/midi Audio/mpegaudio/mpeg Audio/x-mpeg Audio/mpeg3 Audio/wav Image/bmp Image/x-windows-bmp Image/gif Image/jpeg Image/pict Image/x-quicktime Image/tiff Image/x-tiff Text/x-asm Text/plain Text/css Text/html Text/richtext Text/xml Video/x-ms-asf Video/avi Video/msvidoe Video/mpeg Video/quicktime Video/xmpeg
Educational		

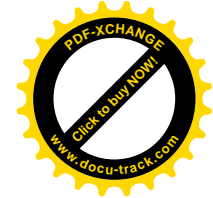


Learning Resource Type	Narrative text	<b>Use the dominant resource type</b> <b>Choose from:</b> Diagram Exam Exercise Experiment Figure Graph Index Narrative text Problem statement Questionnaire Self assessment Simulation Slide Table Case Study Quiz Assessment
Context	Tertiary Level 5	Choose from: Early Childhood, Primary, Secondary, Tertiary Level 1-4; Tertiary Level 5-7, Tertiary Level 8; Tertiary Level 9; Tertiary Level 10.
Typical age range	Adult	
Typical learning time	30 minutes	Use minutes and estimate.
Description	04 Architecture and Building	NZSCED Subject Categories  00 Unknown 01 Natural and Physical Sciences 02 Information Technology 03 Engineering and Related Technologies 04 Architecture and Building 05 Agriculture, Environmental and Related Studies 06 Health 07 Education 08 Management and Commerce 09 Society and Culture 10 Creative Arts 11 Food, Hospitality and Personal Services 12 Mixed Field Programmes
Rights		
Copyright and other restrictions	Creative Commons Attribution-Share Alike 2.5 Licence	Creative Commons Attribution-Share Alike 2.5 License

### 3. Glossary

**Application profile:** An application profile is an assemblage of metadata elements selected from one or more metadata schemas and combined in a compound schema. Application profiles provide the means to express principles of modularity and extensibility. The purpose of an application profile is to adapt or combine existing schemas into a package that is tailored to the functional requirements of a particular application, while retaining interoperability with the original base schemas. *UK Learning Object Metadata Core, Draft 0.2*

**Binding:** A formal method of representing a metadata record using a particular technology, for example XML. *UK Learning Object Metadata Core, Draft 0.2*



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**Interoperability:** The ability of two or more systems or components to exchange information and to use the information that has been exchanged. *UK Learning Object Metadata Core, Draft 0.2*

**Learning object:** An aggregation of digital assets that represents an educationally meaningful stand-alone unit. *UK Learning Object Metadata Core, Draft 0.2*

**LOM: Learning Object Metadata** the attributes required to fully or adequately describe a learning object  
**Metadata:** Structured data that describes data. *UK Learning Object Metadata Core, Draft 0.2*

**Metadata element:** The main fields of metadata that allow for cross-referenced description. It's a fraught area.

The Dublin Core Metadata Element set has 15 elements e.g. contributor, coverage, creator, date.

The Library of Congress Digital Repository Development has several elements including: access category, access rights.

The OSLO project uses 39 grouped into 'instantiation categories' and the Australasian-based Learning Federation uses 10.

The OER project uses 15 elements grouped into categories.

**Schema:** A structured representation that defines and identifies the data elements in an element set. *UK Learning Object Metadata Core, Draft 0.2*

**Semantic Interoperability:** Sharing a language with other metadata schema.

**Taxonomy:** "A subject based classification that arranges terms in the controlled vocabulary into a hierarchy". Garshol (2004).

**Vocabulary:** The words used to describe the types of elements. This can become a fraught issue. We have chosen the National Learning Framework for *Learning resource type* with three additions: Case Study, Quiz and Assessment. Controlled vocabulary: a closed list of subjects. *See Garshol (2004) for a discussion of this.*