



D3.3.1 Report on the agreed metadata standard for learning units

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Abstract.

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A report on the agreed metadata standard is required after the first six months of the Network's existence. This standard is defined quite narrowly as that required for the description of the learning units acquired by Task 3.2.1. In essence the metadata is that needed for the initial collection of learning material which will form the basis for the teaching provided by the Virtual Institute for Semantic Web Education (VISWE) which will result from work package 3.1. The metadata scheme will be used for the material selected and stored in the first phase of the work on the delivery platform for VISWE. We have selected the scheme provided in EducaNext.

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Work package participants

The following partners have taken an active part in the work leading to the elaboration of this document, even if they might not have directly contributed writing parts of this document:

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Changes

Version	Date	Author	Changes
0.1	02-07-2004	Arthur Stutt	Draft
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Executive Summary

According to the KnowledgeWeb Technical Annex a report on the agreed metadata standard is required after the first six months of the Network's existence. This standard is defined quite narrowly as that required for the description of the learning units acquired by Task 3.2.1. It is therefore likely that, as the semantic platform is prototyped, and as more sophisticated access methods are deployed, this basic standard may need to be revised in the light of more advanced needs.

In essence the metadata is that needed for the initial collection of learning material which will form the basis for the teaching provided by the Virtual Institute for Semantic Web Education (VISWE) which will result from work package 3.1. *Note however that the three educational outreach packages are closely linked with many dependencies. Success for one depends on the successful outcome of the others.*

The metadata scheme will be used for the material selected and stored in the first phase of the work on the delivery platform for VISWE. As we have said the second phase, the semantic delivery platform, may require changes to the metadata.

The chosen platform is EducaNext which determined the choice of metadata scheme.

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1. Introduction

According to the KnowledgeWeb Technical Annex a report on the agreed metadata standard is required after the first six months of the Network's existence. This standard is defined quite narrowly as that required for the description of the learning units acquired by Task 3.2.1. It is therefore likely that, as the semantic platform is prototyped, and as more sophisticated access methods are deployed, this basic standard may need to be revised in the light of more advanced needs.

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2. Background to Task

While the KnowledgeWeb network of excellence is currently only just over five months old, participants have a great deal of experience in collecting and making available the sorts of learning material needed for the VISWE. During the lifetime of the Ontoweb¹ consortium an extensive collection of material relevant to the semantic web was collected and made available via a web site.

The URL for this is: <http://qmir.dcs.qmul.ac.uk/ontoweb/>

¹ A research project funded by the IST Programme of the Commission of the European Communities as project number IST-2000-29243.

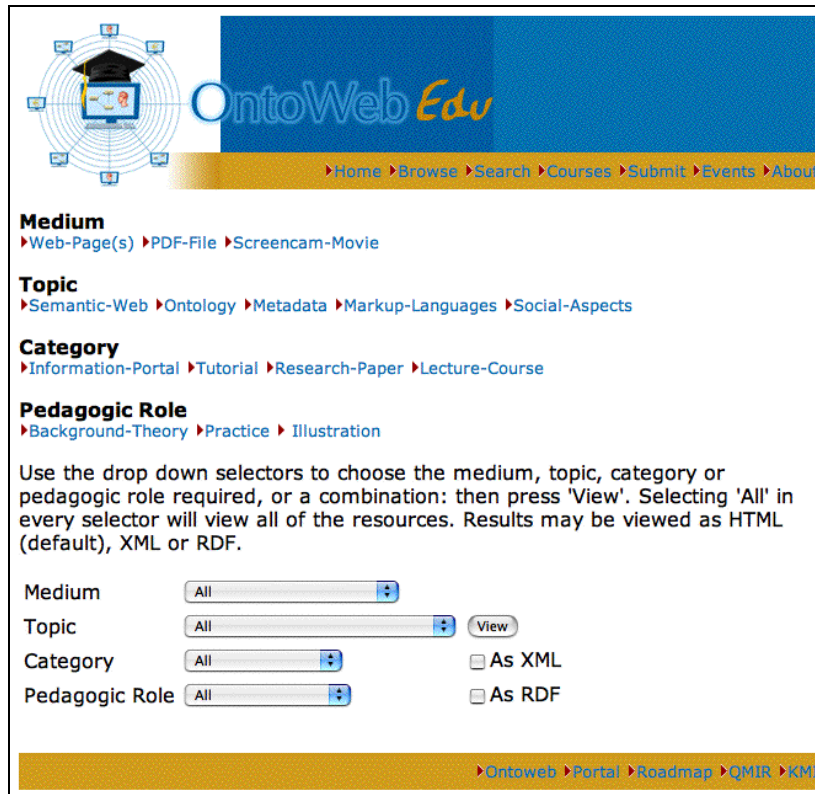


Figure 1: The browser/search interface

This site makes use of a simple ontology for the description of the learning material with categories for Background Theory, Illustrations, and Tools and Exercises as well as pointers to a variety of Portals. The site contains pointers to the actual material which is widely distributed throughout the World Wide Web. The site shares an ontology with main Ontoweb site (<http://www.ontoweb.org>) and can export its databases in RDF.

```

<rdf:Description rdf:about='http://qmir.dcs.qmul.ac.uk/cgi-bin/ontoweb.cgi?f=g&qid=72'>
  <rdf:type rdf:resource='http://www.OntoWeb.org/extended#EducationalResource' />
  <ow:title>A Translation Approach to Portable Ontology Specifications</ow:title>
  <ow:aim>Familiarize with Basic Concepts</ow:aim>
  <ow:audience>Undergraduate</ow:audience>
  <ow:author>T. R. Gruber</ow:author>
  <ow:category>Research Paper</ow:category>
  <ow:date>1993-00-00</ow:date>
  <ow:description>Abstract: To support the sharing and reuse of formally represented
knowledge among AI systems, it is useful to define the common vocabulary in which shared
knowledge is represented. A specification of a representational vocabulary for a shared
domain of</ow:description>
  <ow:bibliographic-details></ow:bibliographic-details>
  <ow:language>English</ow:language>
  <ow:level>1</ow:level>
  <ow:medium>Web page(s)</ow:medium>
  <ow:provider>KSL Reports</ow:provider>
  <ow:role>Background Theory</ow:role>
  <ow:topic>Ontology</ow:topic>

<ow:url>http://www.ksl.stanford.edu/KSL_Abstracts/KSL-92-71.html</ow:url>
<dc:identifier></dc:identifier>
<dc:contributor>ontoweb-edu</dc:contributor>
<dc:coverage></dc:coverage>
<dc:format>RDF</dc:format>
<dc:language>English</dc:language>
<dc:relation></dc:relation>
<dc:publisher>www.ontoweb.org</dc:publisher>
<dc:creator>ontoweb-edu</dc:creator>
<dc:date>Mon Sep 15 15:27:12 BST 2003
</dc:date>
<dc:source>
  http://qmir.dcs.qmul.ac.uk/cgi-bin/ontoweb.cgi?f=g&qid=72
</dc:source>
<dc:rights>2001-2003 (c) www.ontoweb.org</dc:rights>
</rdf:Description>

```

Figure 2: Example RDF output from the Ontoweb Educational Resources Portal

3. Choice of 'LMS'

Having created and circulated four scenarios (Basic repository, MSc support, Professional Support, Support for Communities of Practice) we decided (a) that all of them required a basic repository and (b) that we would concentrate on supporting MSc students with possible future support for Communities of Practice. This decision meant that in selecting a basic infrastructure, we had to:

- provide a basic repository
- be able to tailor resources for MSc students
- be able at some point in the future to add features for supporting communities.

As the companion report on the infrastructure (D3.3.2) indicates, we decided that it was not essential to have a fully blown Learning Management Service since (a) this is not essential for any of our scenarios and (b) any possible candidate would mean that it would be less easy to experiment with providing MSc and community support. Having looked at the alternatives we selected the Educanext platform since this fulfilled our requirements. It provides a basic repository, which has an extensive metadata scheme which can be used for advanced MSc courses and, in addition, provides, albeit basic support for communities. As the companion report (D3.3.2) on the infrastructure concludes, this is satisfactory for the initial deployment of the VISWE platform although

it may be necessary to construct our own portal at some point in the future, e.g., for further personalization of course material, for the deployment of semantic technologies and for more complete support for communities.

4. Alternatives examined

We had two alternatives to a platform such as Educanext:

- (a) to make use of our own portal based, for example, on the OntoWeb Educational Resources Portal, or
- (b) to make use of the full blown IEEE LOM. The former alternative would violate the requirement that the metadata is compliant with standard metadata models (even though it is largely made up of Dublin Core attributes). The latter, as other groups have found (e.g., CanCore) is too detailed and unwieldy.

5. Implications of choice of Educanext

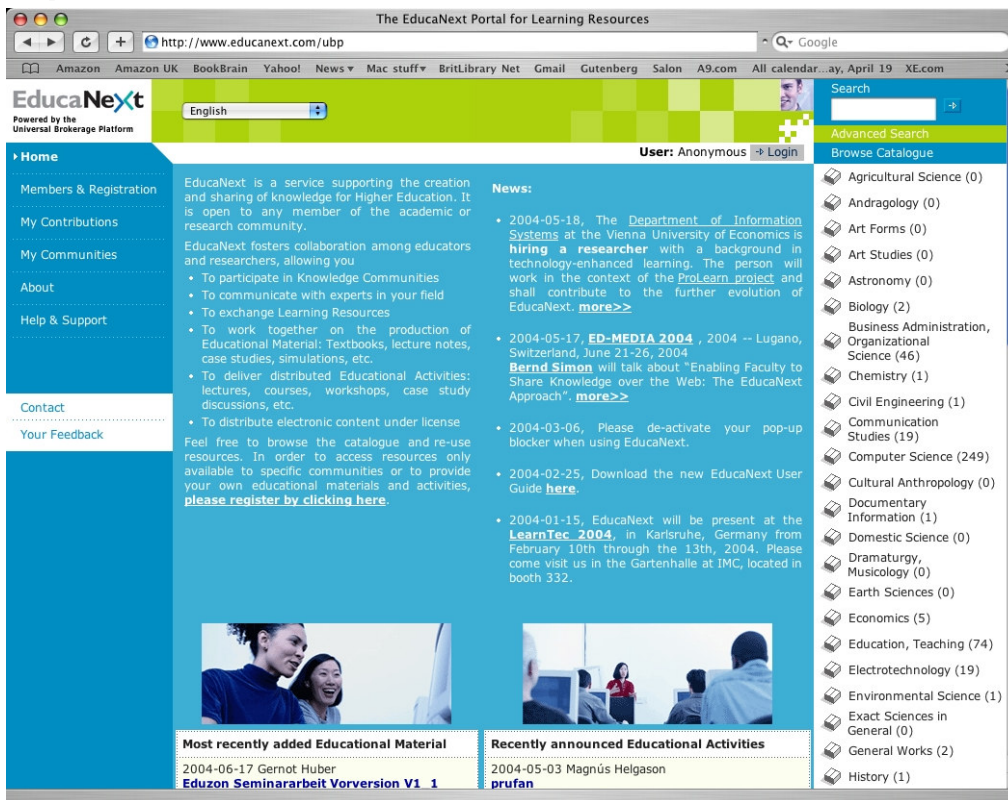


Figure 3: The Educanext portal

One other consideration in the choice of Educanext was that it met all the criteria for metadata listed above. Fortunately, it does.

1. The metadata should cover all the basic properties of the learning material. *As the next section shows, Educanext provides a set of metadata tags which is more than adequate.*

2. The metadata should be extensible to meet future needs. *While there is no means of extending the metadata scheme, the set provided by Educanext will be adequate for most future needs.*

3. The metadata should be compliant with recognized international standards in this area. *As the Educanext² brochure indicates, the metadata model of the Universal Brokerage Platform which underlies the portal “is based on a careful selection of Dublin Core and IEEE LOM attributes”*

4. The metadata (and instances of objects described using the metadata) should be made available to humans or their agents in a widely used format, such as RDF. *The Educanext brochure goes on”... which is mapped into XML/RDF”.*

The Educanext portal also provides a set of metadata quality guidelines³ which will ensure that the data provided is accurate.

“• Providers are strongly advised to publish a complete set of metadata for each learning resource, because it facilitates the selection process for potential consumers.

- Wherever possible, providers should state both a concise description and a learning objective for the Learning Resource. An objective should state explicitly what a learner can expect to acquire in terms of knowledge and/or skills as a result of participating in an educational activity. In the case of educational material, an educational objective should state clearly which kind of learning achievement can be reached by using the material.

- Information about the author is critical. Consumers most certainly want to know this kind of information.

- Contributors' names should be consistently stated. Please avoid using 'K. Maillet' and 'Katherine Maillet' when referring to the same person. Providers are requested to provide contributors' full names instead of their short versions, or initials for first and middle names.

- For complex and/or comprehensive Learning Resources, another layer of descriptive information is necessary. This could be a link to a descriptive web page, in which case, providers are strongly encouraged to provide a link in the "Location of Additional Information" field (i.e. in Step 4 - "Educational Information").

- Please do not use the EducaNext portal for testing purposes by entering fake Learning Resources.

- The EducaNext Community welcomes the opportunity to have theses and research papers listed in the EducaNext catalogue. Providers of theses or research papers are requested to provide an abstract in the 'Description' field (i.e. Step 1 - "General Information"). However, the EducaNext portal should only become an exchange platform for theses and papers to the extent that these kinds of documents can be used to help users to gain sufficient knowledge in a field in order to prepare a course.

² This can be found at

http://www.estandard.no/docs/meetings/UBP_engl_INF_WUW.pdf

³ <http://www.educanext.org/ubp/PUSH/hsupMetadataGuidelines>

- The URL provided to make the link between consumers and educational material should make the material available instantaneously. Please avoid providing links to department/institute or private homepages.
- Providers are requested to maintain and update information about the Learning Resources they provide. Should there be any change in the metadata (e.g. URL to educational material), providers are kindly requested to modify the corresponding fields as soon as possible.”

6. The Educanext Metadata

Title:	E-Learning Technologien
Author:	Bernd Simon 
General Information	
Provider:	Bernd Simon
Learning Resource Language:	German
Description Language:	German
Description:	Folgende Technologien werden in den Unterlagen angesprochen: Lernmanagementsysteme, Lerncontentmanagementsysteme, Videokonferenzsysteme, Simulationen
Classification:	Computer Science: Information Systems: General
Learning Resource Type:	Educational Material, Lecture Notes
Contributors:	Gustaf Neumann (Content Provider) Julia Dietl (Content Provider) Andreas Hilscher (Content Provider) Georg Alberer (Content Provider)
Technical Information	
Format:	MS Powerpoint
Size:	2755072 (bytes)
Educational Information	
Method of Instruction:	Directed Learning

Figure 4: An example Resource description

The Educanext metadata is given below. There are three top level categories: General Information, Technical Information and Educational Information. Included in the first of these is a description of the discipline to which the resource belongs. In the default case, the Dutch Basic Classification System is used. However, it is possible to add other

systems. Thus, we plan to create and deploy a classification system for Semantic Web sub-disciplines.

General Information

Description Language: (Mandatory)

Title: (Mandatory)

Learning Resource Language: (Mandatory)

Description: (Mandatory)

Classification: (Mandatory)

 Default Classification System: Dutch Basic

 Disciplines:

Learning Resource Type: (Mandatory)

 Educational Material

 Educational Material Type: (Mandatory)

 Educational Activity

Typical Learning Time: (Optional)

Contributors: (Mandatory)

Author: (Mandatory)

Location: (Mandatory)

Technical Information

Version: (Optional)

Format: (Optional)

Size: (Optional)

Technical Requirements (Optional)

 Type of Technology:

 Name of Technology:

 Minimum:

 Maximum:

Educational Information

Educational Objectives: (Optional)

Method of Instruction: (Optional)

Location of Additional Information: (Optional)

Curriculum: (Optional)

Prerequisites: (Optional)

ECTS Credits: (Optional)

Disciplines (According to Dutch Basic Classification)

Agricultural Science

Andragology
Art Forms
Art Studies
Astronomy
Biology
Business Administration, Organizational Science
Chemistry
Civil Engineering
Communication Studies
Computer Science
Cultural Anthropology
Documentary Information
Domestic Science
Dramaturgy, Musicology
Earth Sciences
Economics
Education, Teaching
Electrotechnology
Environmental Science
Exact Sciences in General
General Works
History
Human Geography, Cartography, Town and Country Pla ...
Humanities in General
Language and Literature
Law
Linguistics and Theory of Literature
Materials Science
Mathematics
Mechanical Engineering
Medicine
Mining Engineering
Pedagogy
Philosophy
Physics
Political Science
Process Technology
Psychology
Recreation, Leisure
Science and Culture in General
Social Sciences in General
Social and Public Administration
Sociology
Technical Science in General
Theology and Religious Studies

Traffic Technology, Transport Technology
Veterinary Medicine

7. Future work

While this task is now formally complete, we will as mentioned above, monitor the situation to see if it is necessary to extend the metadata scheme either for the delivery of particular scenarios or for the development of the semantic platform or community support.

8. Work in next period

This Task is now complete.