

ACETS Metadata Planning Meeting, 19 Sept 2002

LTS, MVM Edinburgh

Present: Rachel Ellaway (ACETS), Suzanne Hardy (ACETS), Dawn Leeder (ACETS), Sarah Marshall (ACETS), Lorna Campbell (CETIS), Phil Barker (CETIS)

Purpose: to prepare a first draft of a metadata schema for the ACETS project. This to take in to consideration the requirements for cataloguing both objects and exemplar case studies and the planned implementation within BIOME. Representatives from CETIS were invited as advisors on issues of interoperability, validity within the X4L and JISC parameters and to advise on practical issues of methodology and process.

Minutes:

- The ACETS metadata needs to be related to existing recommended and proved instantiations of metadata schemas, standards and specifications. As BIOME is the planned host for the repository its base set (based on Dublin Core — DCMI) is a reference point as is the FAILTE set.
- SH had previously been involved in work at the LTSN-01 comparing BIOME with FAILTE and other sets. The first action was to go through FAILTE term by term, noting whether the term has a BIOME mapping, and discussing whether it was appropriate for the ACETS project.
- In addition to discussing terms, conceptual issues were also discussed such as:
 - the need to have new objects for each and every change to an existing object.
 - The need for exemplar cases to be referenced objects independent of the objects they reference and thus the need for the schema to be able to describe both objects and exemplar cases
 - The need for structures for all of our descriptors — controlled vocabularies (MESH, BEI, METRO) and standards (ISO language codes etc) and so on — these all to be adopted from the public domain
 - a desired goal that the ACETS schema and related thesaurus of descriptors is adopted by the project s constituency and as such that the adopted and published set should be as robust as possible
- LC identified broader concerns for CETIS in relation to X4L projects:
 - CETIS will shortly be appointing an X4L liaison officer to work on interoperability with all X4L projects
 - The role of the strand B projects has not been coordinated with the strand A projects. The X4L development bay and the repository (provided by EDINA/MIMAS) are expected to be used by X4L but ACETS pointed out that BIOME had already been selected as the project repository.
 - This raised questions whether BIOME was able to deliver the functionality required for X4L projects — this to be discussed with BIOME
ACTION — SH to set up meeting with BIOME
 - the absence of a BIOME project officer is also a matter of concern in getting the necessary work done in time. An alternative may be to use the EDINA/MIMAS platforms. These are expected to be available in a very short time.
 - The lack of steer from JISC on this issue was noted
 - In order to be interoperable simply selecting database fields is not enough. Interoperability is required between systems and so interoperability must be sought with those with whom we wish to be interoperable. The med/vet/dent schools + BIOME + BrisBio + relevant FE bodies are our community with whom we must

interoperate

ACTION — SH to discuss at meeting planned for October between BrisBio and LTSN-01

- LC gave a strong steer towards the IEEE Learning Object Metadata model (LOM) as a practical set to work to. The LOM is a standard (IEEE-SA Standard 1484.12.1) as opposed to all of the others which are at best specifications. Furthermore it was strongly recommended that the LOM was used without extensions or modifications. FAILTE tried to modify the LOM and inherited major problems as a result.
- LC identified, based on the project proposal, that all of our terminology needs to be tightened up, especially in respect of its place in the metadata structure. In particular the three level information object — learning object (equivalent to wraparounds) — learning object aggregations
ACTION — terminology to be discussed and chosen terms and definitions made public on ACETS website
- LC recommended using UML to mark up and structure our exemplar wrap-arounds . This is becoming common practice in IMS and beyond (two books Alistair Cockburn s Writing Effective Use Cases and Fowler and Scott s UML Distilled). These can be uploaded as simple text files but may be of more utility in IMS Content Packaging format where the object plus its repository metadata are packaged in a format that can automatically be accessed by compatible systems
ACTION ACETS members to become familiar with UML mark up — RE, DL, SH (others?)
- Regarding the LOM, it is recommended that each term is discussed and adopted/rejected by the ACETS members. This process should be fully documented and therefore carried out in the CWE and with collaboration with CETIS. When agreed this should be published in a human-readable format .
ACTION — elements to be discussed in CWE - ALL
- It was further recommended that the LOM 9 Classification elements are used to add and qualify terms that are not described elsewhere in the LOM structure, which may be derived from a set of agreed controlled vocabularies such as MESH and BEI. In addition the controlled vocabulary might be extended for the subject domains if really necessary.
- There are issues over maintaining the coherence, consistency and reliability of metadata entry were raised. Protocols such as basic entry followed by full cataloguing by information specialists as well as providing suitable controlled web-form access were discussed
- The search returns of making metadata terms intelligible in a search return were also raised — this would require terms and codes being rendered in human readable terms
- Regarding the selection policy of objects for the project, the DNER and Learning Objects project was identified as having created a set of guidelines for this kind of activity that could be used as a guide and starting point for the project
ACTION - LC to provide
- It was also offered (LC to provide) that exemplars of implementations (or otherwise) of the LOM would be great use as reference material for creating the ACETS metadata set
ACTION LC to provide
- It was agreed that the metadata set was inevitably going to need to be adjusted based on practical experiences (when cataloguing, referencing, uploading exemplars and in relation to X4L and broader developments). Thus the set is a best guess and will be proved by the project s development and evolution

Meeting outcomes:

- it is recommended that ACETS adopt the LOM as the basis for its metadata model and that it will adopted without changes or additions where possible. Terms will need to be

discussed and adopted/rejected. This process will be facilitated within the ACETS CWE

- it is recommended that BIOME are contacted and quizzed regarding their ability to support the proposed metadata structure and subsequent developments such as content packaging
- it is recommended that the X4L-B infrastructure is held as a fallback if BIOME are unable to meet project deadlines
- it is recommended that exemplars are structured and recorded in UML format to aid consistency and transferability
- it is recommended that full use is made of the CETIS experience and knowledge in this area, that LC and PB are given honorary ACETS status with access to the CWE. Furthermore CETIS will continue to be kept informed of ACETS developments in this area
- it is recommended that ACETS terminology is refined and defined within the project to permit consistency in creating and using the metadata set
- it is recommended that the metadata model has been agreed and passed to BIOME for implementation by the time of the next ACETS meeting in November
- it is recommended that all of the processes are fully documented and made available as one of the project deliverables along with the metadata set as exemplars and leads for other similar and related projects in our discipline areas
- ACETS would like to record the major and essential input from CETIS to this meeting and thus to the project as a whole

Appendix 1

The following was supplied by Lorna Campbell for the ACETS project to consider:

DNER and Learning Objects (Draft)

Lorna M. Campbell & Sarah Currier - 14/06/02

Evaluation Criteria

Granularity and aggregation level

Granularity and aggregation level refer to the concepts, components and activities that make up resources and the way that these resources are combined. IEEE LOM defines aggregation level as being the functional granularity of a learning object. Although granular resources do not necessarily have to be small in terms of file size, highly granular resources tend to be relatively small, discrete and focused on a single or simple concept. These granular resources, such as information objects or learning objects can be combined, or aggregated, with other objects to form new resources such as units of study or information resources. IEEE LOM distinguishes four levels of aggregation:

1. The smallest level of aggregation, e.g. raw media data or fragments.
2. A collection of level 1 learning objects, e.g. a lesson.
3. A collection of level 2 learning objects, e.g. a course
4. The largest level of granularity, e.g. a set of courses that lead to a certificate.

For the purposes of this project the LOM classification has been expanded to include the following categories. In this instance an aggregation is defined as one or more, rather than more than one.

- **Information object.** A simple object that does not have a specific educational objective and is not situated within an educational scenario, e.g. an image, text file or reference.

- **Information resource.** An aggregation of information objects, which does not have a specific educational objective, and which is presented as a cohesive unit e.g. an online encyclopaedia, e-book or e-journal.
- **Learning object.** An object that demonstrates, or focuses on, a specific educational concept, e.g. a learning activity task or assessment.
- **Unit of study.** An aggregation of learning objects and information objects, also referred to as a lesson.
- **Module.** An aggregation of lessons and learning objects.
- **Course.** A large aggregation of lessons, modules and other related resources.
- **Collection.** An aggregation of two or more of any of the above types of resources, which does not have a specific educational objective overall, and which is not presented as a cohesive unit, but rather is tied together via a search or browse mechanism such as a catalogue or search engine e.g. a collection of digitised slides, a database of learning objects.

Reusability

In defining a resource's level of reusability several factors need to be considered:

- **Technical format.** Is a resource tied to a single delivery platform or technology?
- **Contextual dependency.** Does the content of the resource reference other related, but external, resources? E.g. a resource may refer to a glossary or to the next module in a sequence.
- **Technical dependency.** Is the delivery of the content technically dependent on other resources? E.g. HTML pages that are linked in a linear navigation sequence, interactive content that relies on server side scripts, Java applets with class files residing on remote servers.

In practical terms, reusability is often dependant on a resource's granularity and aggregation level but these criteria should not necessarily be equated. For example, highly granular information objects may be held in a proprietary content repository but if these resources cannot be exported or accessed in a common standard format then they are not at all reusable.

For the purposes of this project a resource's reusability is classified as follows:

- **Reusable.** Resources that can be delivered via a wide variety of platforms or technologies, which do not reference related external content and which are not technically dependent on other external resources e.g. LIFESIGN's video streams: (<http://www.lifesign.ac.uk/>).
- **Somewhat reusable.** Resources which may be restricted to a single delivery technology but which are still relatively reusable due to the ubiquitous nature of that technology e.g. HERON's digitised texts, which are PDF files (<http://www.heron.ac.uk/>).
- **Potentially reusable.** Resources that have the potential for reuse, i.e. they may be delivered in a standard format, e.g. HTML, but are dependent on related resources e.g. the individual sections within The Biota of Early Terrestrial Ecosystems: The Rhynie Chert: A Teaching and Learning Resource (<http://www.abdn.ac.uk/%7Egmi265/profiles/rhynie/index.htm>), which is delivered on the web via HTML. These sections all contain links to other sections within the resource, including the Glossary and Bibliography.
- **Not reusable.** Resources that are restricted to a specific delivery platform or technology, and/or are highly dependent on related resources e.g. Virtual Learning Arcade's simulations (<http://www.bized.ac.uk/virtual/vla/>), which run on a specific server.

Metadata

Before resources can be reused they must first be located and their suitability for use within a particular educational scenario evaluated. This type of resource description and discovery is facilitated by learning object metadata. In addition to evaluating DNER resources in relation to the criteria outlined in this document, the DNER and Learning Objects project will also record individual projects' use of metadata.

Subject specificity

In defining a resource's subject specificity, no distinction has been drawn between the terms subject and discipline. For the purposes of this study, resources' subject specificity is classified as follows:

- **Generic.** Resources that can be used for teaching and learning in any subject field or discipline e.g. Bristol BioMed's How-To Guide Putting videoed lectures on the Web (<http://www.brisbio.ac.uk/bblt/video.html>). Although it could be argued that this resource is Subject Specific to, say, Education, or Web-based Teaching, it is its applicability to someone teaching in any discipline that makes it Generic. See also under **Horizontal / Vertical reusability**.
- **Interdisciplinary.** Resources whose subject content make them applicable to teaching and learning in more than one discipline or subject e.g. The Biota of Early Terrestrial Ecosystems: The Rhynie Chert: A Teaching and Learning Resource (<http://www.abdn.ac.uk/%7Egmi265/profiles/rhynie/index.htm>), which was designed to be of greatest value for Honours Geology students but can be used by anyone with an interest in earth or life sciences. This resource includes content that is of relevance to botany, zoology, geology, paleo-sciences, and archaeology. See also under **Horizontal / Vertical reusability**.
- **Subject specific.** Resources that are designed only for use within a specific subject or discipline e.g. the RDN Virtual Training Suite Tutorials (<http://www.vts.rdn.ac.uk/>) each of which is designed for a particular subject area or discipline.
- **Resource specific.** Materials that are designed only for use with a specific resource e.g. FirePower: Learning & Teaching Materials for Beilstein CrossFire (<http://www.mimas.ac.uk/crossfire/firepower/>).

Horizontal / Vertical reusability

Horizontal reusability equates to **Generic** or **Interdisciplinary** subject specificity (see above). It refers to resources that can be used across different educational subjects and disciplines e.g. an image of a castle used within an architecture resource may be potentially reusable in any number of disciplines (e.g. history; archaeology; photography), regardless of the intention of the resource producers.

Vertical reusability refers to resources that may be used at more than one educational level e.g. a learning object outlining a basic mathematical concept may be reusable at undergraduate or post-grad levels. For the purposes of this study, resources' vertical reusability is classified as follows:

- **No.** Resources that are only appropriate for use at a single specific level of study e.g. LEMUR's Planning and Managing a Theme: Marischal Museum Victorians Workshop (http://www.abdn.ac.uk/marischal_museum/services/bed/), which is designed specifically for a BEd (Primary) course.
- **Potential.** Resources that are not necessarily developed with vertical reusability in mind, but that may be used at different levels of study e.g. Virtual Norfolk (<http://www.uea.ac.uk/his/virtualnorfolk/>) which could be used for teaching and learning on the history of Norfolk at various educational levels.
- **Yes.** Resources that include specific support for use at different levels of study e.g. Digital Egypt for Universities, which includes Guided Tours (http://www.petrie.ucl.ac.uk/digital_egypt/main/toursintro.html) aimed at different levels of understanding, including absolute beginners.

Interactivity

At the most basic level, interaction involves communication and the degree of control a user is afforded over the learning resource. A user acts, the system reacts and the resultant process is termed interaction. ICONEX web site: <http://www.iconex.hull.ac.uk/interact.cfm>.

For the purposes of this project an interactive element is defined as an activity that the user of a resource may perform, which may result in a more than one potential response from the resource.

Examples of interactive content include simulations and multiple-choice questions. For the purposes of this project, resources' level of interactivity is classified as follows:

- **No.** No interactive elements within the resource e.g. CSCCA Digitisation Project s Unit 1: Pioneers and Their Practice: A Reference Guide (<http://vads.ahds.ac.uk/learning/pictiva/CSC/>), which consists of web-based text, collections data, and images only.
- **Some.** There are interactive elements within the resource e.g. Bristol BioMed Learning & Teaching s tutorials (<http://www.brisbio.ac.uk/bblt/res.html>), some of which include interactive multi-choice self-assessment exercises.
- **Yes.** The entire resource is interactive, or is based around interactivity e.g. Virtual Learning Arcade (<http://www.bized.ac.uk/virtual/vla/>), which consists of large and small scale economics simulations, accompanied by resources which support their use.

Interoperability

IEEE define interoperability as being:

The ability of two or more systems or components to exchange information and to use the information that has been exchanged [IEEE 90: Institute of Electrical and Electronics Engineers. IEEE Standard Computer Dictionary: A Compilation of IEEE Standard Computer Glossaries. New York, NY: 1990.].

Interoperability is not a property of a resource; rather it is a property of the relationship between systems in a particular context. Therefore it is impossible to evaluate the interoperability of DNER content. However by evaluating and recording the factors outlined above it should be possible to gauge a resource s potential to interoperate with virtual learning environments, digital repositories and other content management systems.

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