

Summary of consultation 2003

VET Learning Object Repository Project

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Introduction

Training facilitators have traditionally used a range of resources in their work. These resources may include student handouts, overhead transparencies or photographic slides, and while each of these may have some learning value in their own right, they are often combined to form more substantive blocks of learning.

In recent years, many of these resources have been replaced by their digital counterparts; multimedia CDs, web-pages, videos and electronic documents are now commonplace in many classrooms. As training facilitators have come to grips with these new technologies, they have also found new ways to combine them.

As the potential for sharing and re-using these resources (learning objects) grows, so does the need for cataloguing (metadata) and their storage (repositories). This paper looks at some of the issues facing the Australian Vocational Education and Training (VET) sector and suggest a way forward that will enable consistency in the development and use of VET Learning Object Repositories.

Background

This paper has been created at the request of the Australian Flexible Learning Framework (Framework). It is the second in a suite of papers being produced by the VET Learning Objects Repository Project. The first paper, released in June 2003, was a Green Paper for Discussion. The Green Paper was the result of a three-month literary review and subsequent consultation program involving lecturers, content developers and managers active within the VET sector.

The aim of the Green Paper was to facilitate consultation within the VET sector to define a set of guidelines on the development and use of learning object repositories. The release of the Green Paper was followed up by a series of focus group sessions, one-on-one expert consultations, and online discussions over a two-month period.

This paper is intended to synthesise and summarise the findings of these consultations and to present the current state of play of learning objects and repositories within the Australian VET sector.

The consultation process

Following the release of the Green Paper in June 2003, the project team undertook a two-month consultation program. During this period, the Green Paper was widely distributed, and was made available on both the Framework website (www.flexiblelearning.net.au) and featured on the Australian Flexible Learning Community website (learnscope.flexiblelearning.net.au).

As part of the consultation process, the project team actively sought feedback from a number of areas including the Resources for Teacher Learning and Assessment (RTLTA) group, and the Open Training Education Network (OTEN) as well as a series of one-on-one consultations with members of the projects Expert Advisory Group and college practitioners.

In addition, the project team conducted a number of focus group sessions, and invited comments from lecturers, managers, resource developers and cataloguers from both public and private RTOs across several states. Participants at these focus groups were asked not only to comment on the Green Paper but were also invited to discuss some of the key issues it highlighted. The discussions that followed can be divided into the following broad categories:

- Learning objects and their definition
- The learning object life cycle
- SCORM and its suitability for the VET sector
- Pedagogical and instructional design issues
- Object repositories and their structure and use
- The role of metadata and metadata standards.

The remainder of this paper is devoted to the discussion of these issues.

Learning objects and their definition

The term *Learning Object* has been defined in a number of different ways by various organisations and standards bodies. The Green paper questioned the need to provide a definition specific to the VET sector. As Higgs et al (2003) have pointed out, 'One of the weaknesses with many learning object implementations has been the concentrated effort on learning objects themselves rather than the systems they inhabit or need to play out in'.

Exploring the broader issues surrounding learning object exchanges was deemed more advantageous than focussing too narrowly on a definition. There was also a concern that the wide range of opportunity for object re-use could be restricted by rigid definitions of what an object should be.

The IEEE's Learning Technology Standards Committee (LTSC) defines learning objects as 'any entity, digital or non-digital, which can be used, re-used or referenced during technology-supported learning'. While the IEEE's definition has received wide acceptance in the learning object community, our consultation suggested that the definition may be flawed, leading to confusion since the term *learning object* suggests a resource should be self-contained and meet a specific learning objective.

During our discussions, it was determined that while there remains a lot of angst over the need to define learning objects, such a definition is not essential for either interoperability or re-usability. However, a common VET sector understanding would assist us in developing the concept of the sharing and re-use of objects.

Characteristics of Learning Objects

The consultation process indicated that to facilitate a common understanding of how the object concept may be applied to the VET sector, it would be useful to develop a set of key characteristics that are common to the wider range of learning resources within any given repository. Exploration of this approach led to the discovery of five desirable characteristics as follows:

- Discoverable
- Interoperable
- Context-able
- Editable
- Re-usable

Within the VET Learning Objects Project team this is referred to as the **DICER** model. The key characteristics of this model are explained below:

Discoverable

In order for any resource within a repository to be of any use it must be discoverable. Good metadata increases the level of discovery; that is the ability to deliver a contained set of results with a high proportion of relevance to the subject matter. It also provides a mechanism for the management of objects and digital rights information.

Interoperable

Interoperability is about being able to share resources across repositories, organisations and learning/content management systems. To enable this interoperability, resources should conform to standards in two main areas:

Metadata - using common standards to describe resources allows computer systems to take a standard approach to searching and displaying the metadata descriptions.

Packaging - To select a range of resources from a repository and combine them into a learning sequence, it helps if they are all packaged in a standard way that allows them to be used in a range of learning management systems. The Shareable Content Object Reference Model (SCORM) is an evolving standard that supports this concept.

To enhance interoperability in the VET sector, all resources should have a minimum set of metadata based on international standards. Compliance with the SCORM standard is not necessary for all resources. Whether it is required or not will depend on the intended end use of the resource.

Context-able

Context was seen as an important part of learning resources for the VET sector. Within the proposed model, this can refer to those resources that either have an existing level of context (i.e. contextualised) or can be used within a variety of contexts (i.e. context neutral). In either situation, a learning resource can be context-abled.

Editable

The ability to take existing resources and edit them was another extremely important characteristic for VET sector resources. In terms of the proposed model an editable resource is one that can be retrieved, saved, edited and used. It is also recognised that this process may lead to the spawning of new resources that may be resubmitted to the repository.

Re-usable

Another key characteristic for learning resources is their potential for re-usability. Re-usable resources within a repository can be assembled to provide resources in various learning environments, i.e. content developed in one context being transferable to another context. As Higgs, Meredith and Hand (2003) note, this notion 'is fundamental to leveraging any advantage associated with reusable objects'.

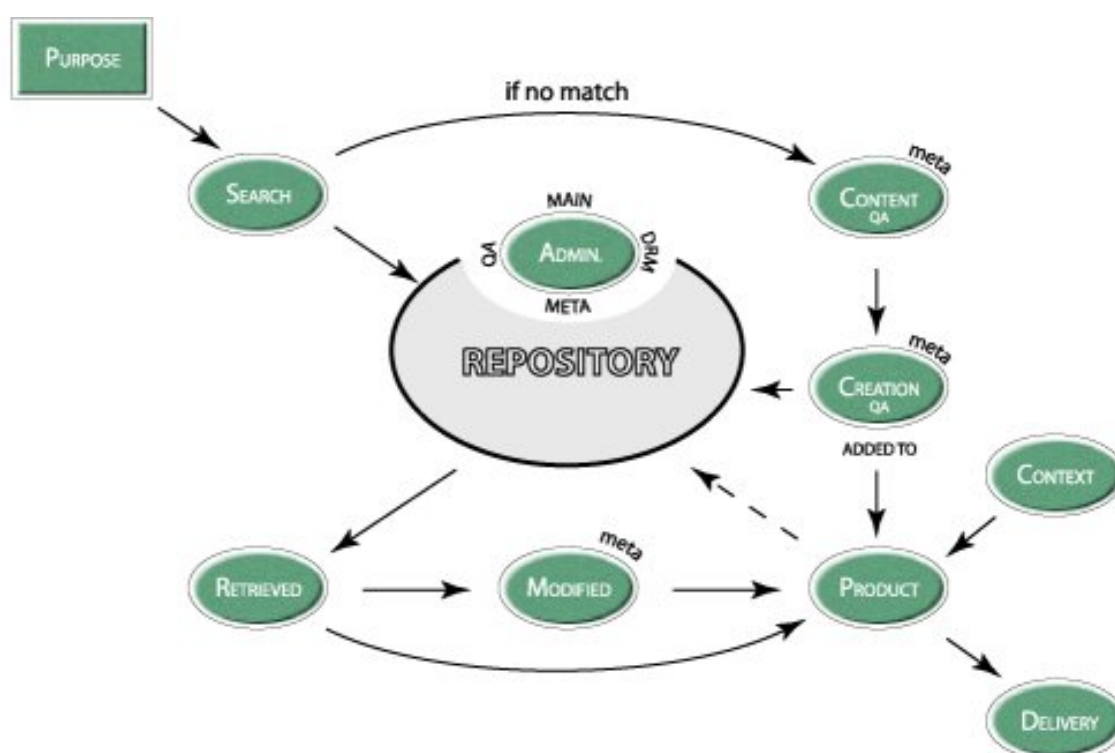
The **DICER** model allows for multiple types of learning resources (re-usable objects) including:

- Lesson plans

- Graphics
- Assessment tools
- Quiz/tests
- Case studies
- Scenarios
- Animations
- Assignments

Life cycle

The Vet Learning Object Repository Green Paper proposed the following life cycle for learning objects.



LEARNING OBJECT LIFE CYCLE

A full description of the Learning Object Lifecycle and the various components were described in the Green Paper. As part of the consultation phase, this model was presented to various focus groups for discussion. The following is a brief summary of the feedback received:

Purpose: It was recognised that for learning objects to be of the most value they need to be specifically built. It was also suggested that it may be difficult to apply the learning object paradigm to historical resources.

Search: Practitioners would like to search for learning objects based on a multiple of search techniques, such as keyword and topic or subject searches.

Admin: The Green Paper suggested that an administration function is central to the functioning of the repository. This view was supported throughout the consultation particularly in terms of DRM and quality management.

Retrieve: The consultation showed that lecturers would like the opportunity to preview and retrieve learning objects such that they can be saved locally (i.e. save a copy of a resource to a lecturer's desktop) was a desirable feature of a learning object repository.

Content: The green paper suggested that metadata is gathered at this phase describing the content and pedagogical attributes of the resource. While the general consensus was that the person creating the content should also add metadata, it was also acknowledged that this was not the only phase in which the metadata was added.

Creation: The creation phase reflects the actual building of the resource. As the resource is developed, the appropriate metadata would be added.

Product: The product phase may pull a variety of objects together, including new and modified products in order to create an appropriate learning sequence. The ability to submit modified resources back to the repository was seen as a desirable feature of this phase.

During the consultative phase, the following issues were raised:

- Idealised DRM/copyright procedures were flagged as a problem area. Applying for viewing periods, requesting/negotiating licence agreements and other DRM requirements can be a hindrance to busy practitioners. There is a need to identify ways in which these processes can be streamlined or how the bulk of DRM overheads can be taken care of by information or repository managers.
- Return on Investment (ROI) for contributors is unclear. If practitioners are going to be expected to contribute content they will require both time and reward for effort. The University sector found that lecturers are rewarded for publishing in a journal as the kudos helps towards salary increase and promotion whereas publishing for an online repository did not provide similar rewards.
- The role of an information or repository manager is crucial but also a cost factor. While there needs to be some return for the energy expended in creating and managing repositories, materials cannot be too expensive as this would inhibit usage. Solutions for this may be to charge a small usage fee (similar to the shareware concept) on an annual basis.

SCORM

The VET Learning Object Repository Green Paper described SCORM as a collection of specifications to create a 'unified content model' to enable the re-use of learning materials across a range of products and platforms. It includes:

- specifications for representing course structures
- specifications relating to the run-time environment
- specifications for creating metadata records for courses, content, and raw media elements.

It would appear from the consultative process that there is a great deal of interest in SCORM and its potential for the VET sector and the topic was discussed at several of the focus group sessions.

During the various focus groups, it was noted that SCORM had a number of advantages as follows:

SCORM is an international standard. This was seen as a major advantage for SCORM. The standard is backed by the Advanced Distributed Learning Network (ADL) and has strong support of both IMS and the International Electrical and Electronic Engineering Associations (IEEE) who are committed to ensuring its ongoing evolution and support.

Several focus groups noted that SCORM is currently the defacto standard for eLearning and is supported by several of the major LMS¹ developers.

A standardised approach to content packaging. SCORM uses the IMS content packaging format which allows for the simple distribution of courses since they can be created and stored in the way their creator needs. A standardised manifest file describes their structures and makes their manipulation easy.

The IMS content packaging is well supported by the majority of LMS developers.

Interoperability across systems. SCORM-compliant content can be used on any SCORM compliant learning management system. This means that content from many different sources can be used on any SCORM compliant LMS.

While these advantages are a source of significant attraction to the VET sector, there is also significant debate in academic circles of SCORM's ability to meet a student's learning needs, particularly in regard to pedagogy and context.

This is centered on the claim that SCORM is 'pedagogically neutral'; in addition, individual SCOs (Shareable Content Object) by themselves should be as independent of learning context as possible so that they may be re-used in different learning experiences to fulfil different learning objectives. This is of particular concern with many regarding the combination of context and pedagogy as the key to a meaningful educational experience in VET. Attempts to remove context to enable greater re-usability or SCORM compliance may damage the vast connections learners make from a realistic example or a concept placed in context.

It is, however, early days for SCORM. Ongoing research and pragmatic testing and experimentation may be able to overcome some of these contentious issues.

Pedagogical issues

The VET Learning Object Repository Project Green paper identified a number of pedagogical and instructional design issues emerging as the quest for workable, interoperable and user-friendly learning object repositories gains momentum.

¹ Such as WebCT and Blackboard.

In no order of priority, some of these issues include:

1. the balance between context and re-usability
2. the role of the teacher in learning
3. the move toward automated or formatted learning sequencing
4. the practicalities of object repositories.

Balance between context and re-usability

During the consultation process, it was agreed that context is crucial for good learning. It was acknowledged that practitioners could make use of both contextual and generic objects within a repository. In blended learning and other teacher oriented instruction, the teacher can provide the context. Objects that can be edited would assist teachers in customising the material to their own needs.

Since *learning objects* should meet a specific learning outcome, it was deemed that they should be contextual. For those implementing SCORM compliance, this presents a conflict since SCORM recommend that SCOs be context neutral in order to enhance their re-usability. Common sense should prevail here and content developers should take the approach that best suits their objectives. For example, a combination of both contextual objects (case studies etc.) and context neutral objects can be used.

The role of the teacher in learning

VET teaching practices are predominantly teacher centric and it is envisaged that most digital objects will be employed in teacher driven learning. Practitioners view a digital object repository as being similar to that of a traditional library. It will provide them with resources to choose from and how they apply these resources in the learning environment will be at their discretion.

The role of the teacher remains essential; however, it will change as new skills are developed and the use of technology in teaching grows. Some sections will progress faster than others with adoption being influenced by factors including:

- staff expertise
- infrastructure
- student demand
- subject discipline.

Move toward automated or formatted learning sequencing

In the SCORM system, the Learning Management System (LMS) is empowered to enable *complex directed learning experiences*. This means, for example, that the run time environment can decide which SCO to present next to a learner depending on the level of competency achieved in a SCO just completed. This is an optional feature of the SCORM specifications and it is not seen as critical to the role of VET sector teaching.

Inadequate technical infrastructures such as one computer lab for 1100 students and slow Internet connections are still a barrier for some practitioners. Technology solutions have only been adopted by a few and mostly in an ancillary or support fashion. Fully automated teacher-less systems are therefore not considered a viable option for the VET sector at this time.

Practicalities of object repositories

Throughout the consultative process, a number of issues were identified that will impact on the creation and usage of learning object repositories.

Keep it simple

Practitioners are very busy and will not have time to learn complex systems or browse through mass amounts of objects. Repositories will need to provide simple to use and easy to learn interfaces that can return quality resources that can easily be employed in teaching and learning. As one respondent commented, 'Perhaps the number of barriers to uptake is equal to the number of clicks before a teacher can put an LO in part of their delivery design'.

Other perceived obstacles to uptake of the object concept included: delays in viewing and accessing objects, poor quality objects, too much DRM overhead and difficulty finding relevant objects.

Reward for effort

Repositories must offer value to practitioners such as saving time or providing support. Also practitioners creating resources to share must have some form of reward for effort. Similar initiatives in higher education have shown that 'there is little doubt that the benefits of sharing learning and teaching materials are still valid, however, it is evident that such a notion may only emerge once the issues of reward for effort and intellectual property contribution are overcome.' (Koppi & Lavitt)

Raising awareness and providing support

Practitioners will need to be kept informed on a number of issues including: what repositories are available, how to use objects in their learning and how to conform with digital rights procedures.

Training will also be required at a management level and organisations will need to keep abreast of evolving standards for metadata and repositories, work flow processes, digital rights management and new types of business models.

Object repositories and their structure and use

The VET Learning Object Repository Project Green Paper raised the question: Should there be one national repository for the VET sector or multiple repositories at an organisational level?

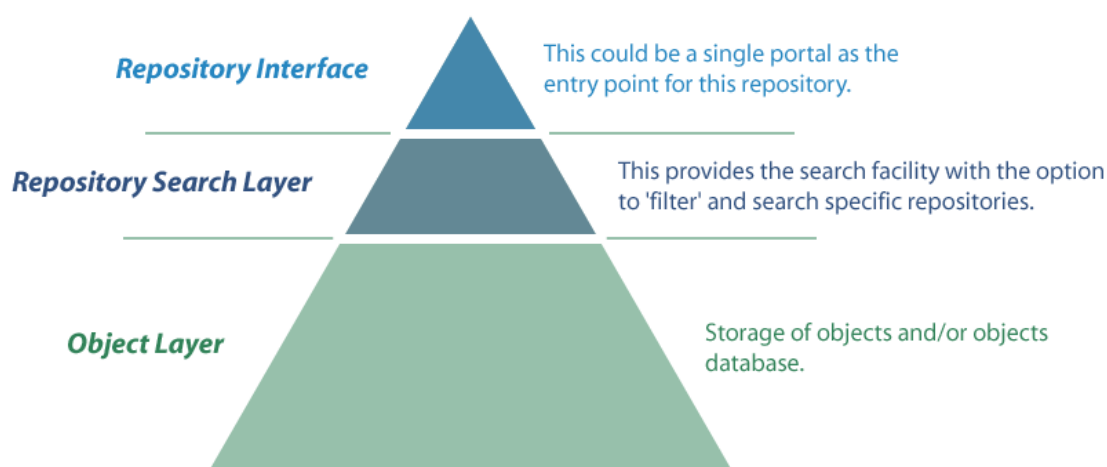
During the consultative process, it was suggested that the development of a national repository was an opportunity to build on existing national initiatives such as the Flexible Learning Framework. It was also suggested that since we have standard

training packages at a national level that are already partially supported by associated teaching and assessment resources, there may also be the opportunity to extend the resource base to include standard learning objects that comply with those training packages.

The main consensus was that a model where leadership, standards, support and coordination at the national level was supported by multiple repositories at the local, RTO and state level provided a better approach. Reasons for this included:

- Quality assurance and maintenance procedures are easier to manage and more cost effective at an organisational level.
- A large repository could quickly become unmanageable.
- Organic growth is more feasible - small-scale implementations, directed by practitioners can inform future initiatives.
- Organisations, industry and business models differ considerably both intra and interstate. A central repository may fail to meet all the needs of the various organisations.
- It is unclear who would be responsible for funding and managing a central repository.

One proposal for intra-organisational repositories follows the pyramid model. That is a three-tiered approach in which the top layer of the model provides the search interface for the repository. The middle layer provides the searching facility with the ability to only search selected objects within the repository based on which filters the user selected at the top layer. The third and final tier represents the repository itself, a storage area for learning resources. Diagrammatically, the pyramid model can be represented as follows.



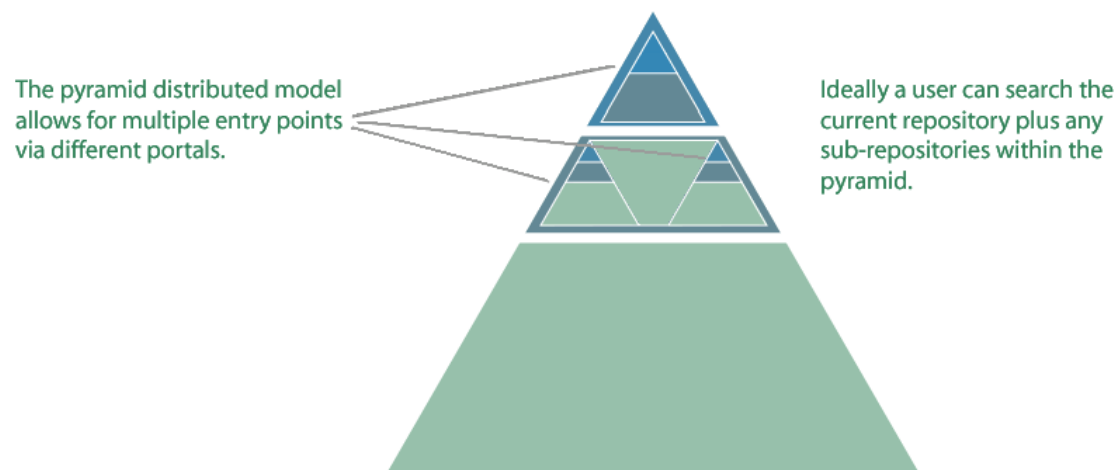
Repository infrastructure

The IMS Digital Repositories Specification (2003) defines a repository as a collection of assets or metadata that describes assets that are accessible via a network. The specification builds on other relevant specifications such as IMS content packaging and the IMS metadata specification.

The DRIS is intended to be an international specification for the development and implementation of interoperable repositories. More specifically, the specifications are geared towards creating collections of resources capable of exposing metadata to

resource utilisers for the purpose of searching, gathering, storing, and delivering assets.

The specification addresses how users and tools interact with repositories to input, discover, locate, and deliver learning object metadata and the associated content. It does this by defining a specific set of functions and protocols that enable a diverse range of eLearning systems to communicate with each other. Ideally, future users should be able to conduct distributed searches across a number of repositories rather than having to access and search each directly. This can be represented using the Pyramid model as shown below.



The following table summarises some of the major recommendations of the specification:

Summary of recommendations contained within the IMS DRI specification	
Searching	Use Xquery for XML metadata Use Z39.50 for SQL databases
Web Services Messaging	Use SOAP with attachments over HTTP
Metadata	Use IMS Metadata Specifications
Content Packaging	Use IMS content packaging specifications
Learning Object Specification	DRI does not prescribe a specification for learning objects
Identification of Learning Objects	Use the DOI – Digital Object Identifier

Organisations setting up their own repositories should view these recommendations and assess their applicability to their own objectives.

What should a repository do?

The consultative process aimed to define the main characteristics for a functional object repository. The main features identified are summarised below:

Add value – a repository must have something tangible to offer practitioners. It could save them time creating or preparing teaching and assessment materials. It could provide them with media that is otherwise difficult or expensive to obtain such as

animations, graphics and audio clips. It could provide them with an avenue for sharing and receiving recognition for material they have created.

Transparency – searching, deployment of objects and uploading of objects should all be simple and easy processes. If it takes up time, is not easy to use or has download problems then it will most likely fail.

Quality – if a user finds an object poor in quality they are unlikely to return to a repository. There needs to be some form of quality assurance process to set standards for new objects and maintenance programs to keep objects relevant and up to date.

User or peer reviews – this type of community dialogue was viewed as beneficial. It also assists with quality control as objects failing to achieve good reviews can be identified and removed.

Assistance – help options such as online tours or someone to contact (repository manager or librarian) should be available to assist users who encounter difficulties.

Sound business model – to be successful a repository must be part of a sound business model that ensures that costs such as metadata generation, maintenance and review and quality assurance processes can be carried out effectively.

Flexible range – As one respondent noted the VET sector may need to be broad in its perception of what can constitute re-usable resources. There may be a need for some good quality printable material that lecturers can just print out and use as well as more media intensive objects.

Marketing and training – practitioners need to be made aware of available repositories and how to access and use the resources in their teaching practices.

The role of metadata and metadata standards

Focus group participants acknowledged that good metadata increases the level of discovery; that is the ability to deliver a contained set of results with a high proportion of relevance to the subject matter. It also provides a mechanism for the management of objects and digital rights information.

The development and implementation of metadata standards, applications and services is an integral part of the emerging knowledge economy and the object paradigm.

The main standards relevant to learning objects in the VET sector are:

1. EdNA Metadata Standard
2. IEEE Learning Object Metadata (LOM) Standard (a subset of the IMS standard)

The EdNA standard is currently in wide use in Australian education. Metadata in this format can be harvested by EdNA Online and displayed on their website. The harvesting community currently include:

- AShareNet
- AMOL
- FLAG

- Western Australian Education Department
- Tasmanian Education Department
- Queensland Department of Education.

The EdNA standard is adequate for most VET applications. However, the LOM standard is useful for describing educational attributes. It is also the standard required for SCORM compliance.

SCORM uses a mandatory subset of LOM elements to describe resources. The metadata is optional but highly recommended. Organisations intending to develop SCORM compliant objects should use the mandatory LOM elements in their application profile. It is also feasible to use EdNA metadata elements and to later map them to LOM elements for use in SCORM compliance.

Two key findings out of the consultation phase were the need to use an appropriate metadata application profile for learning objects and the need for minimal metadata standards incorporating a set of mandatory elements.

Metadata Application Profiles

A Metadata Application Profile outlines the metadata elements an organisation will use to describe its objects. During the consultation process, it was acknowledged that Metadata Application Profiles would vary between organisations. A profile can incorporate elements from a number of standards for instance:

- EdNA elements to describe the object
- LOM elements to describe the learning specific information about the object
- ODRL to describe Digital Rights Management information relevant to the object.

Minimal metadata standards

There is a cost associated with the creation and application of metadata to learning objects. There is no doubt that the more complete a metadata application profile is and the quality of that metadata is going to make learning objects more discoverable within a repository.

During the consultation phase it was agreed that, in the interests of interoperability and to achieve a suitable return on investment, there is a need for meta-taggers to follow a set of minimal metadata standards. As an example, the Open Training Education Network (OTEN) TAFE NSW Online Project 8 Metadata, suggests seven elements based on the Dublin Core standard plus an additional two that are specific to the NSW Department of Education and Training. This results in a set of nine mandatory elements that are consistent with the Australian Government Locator Service (AGLS) standards as described in Table 1.²

Element Name	Description	Example
DC:Identifier	An unambiguous reference to the resource within a given context.	Recommended best practice is to identify the resource by means of a string or number conforming to a

² Descriptions and examples from www.dublincore.org.

		formal identification system. Formal identification systems include but are not limited to the Uniform Resource Identifier (URI) (including the Uniform Resource Locator (URL)), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN).
DC:Type	The nature or genre of the content of the resource.	Type includes terms describing general categories, functions, genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (for example, the DCMI Type Vocabulary [DCT1]). To describe the physical or digital manifestation of the resource, use the FORMAT element.
DC:Description	An account of the content of the resource.	Examples of Description include, but are not limited to: an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content.
DC:Subject	A topic of the content of the resource.	Typically, Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.
DC:Publisher	An entity responsible for making the resource available.	Examples of Publisher include a person, an organisation, or a service. Typically, the name of a Publisher should be used to indicate the entity.
DC:Creator	An entity primarily responsible for making the content of the resource.	Examples of Creator include a person, an organisation, or a service. Typically, the name of a Creator should be used to indicate the entity.
DC:Date	A date of an event in the lifecycle of the resource.	Typically, Date will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and includes (among others) dates of the form YYYY-MM-DD.
DET:Version	References the version number.	These last two elements are from the Department of Education and Training (DET) metadata standards and are used by OTEN for tracking purposes.
DET:Status	References the status.	

Table 1

If an organisation is intending to create SCORM compliant content, it would be advisable to adopt the LOM mandatory elements as their minimum metadata set.

Controlled vocab and thesauri

During the consultation process, the project team asked the question if there was a need for a consensus on the type of language used to describe resources within a repository, i.e. a need for a controlled vocabulary.

Controlled vocabularies use standard terms to index metadata as opposed to free text. This provides consistent retrieval whereas the use of free text leads to individuals using different terms to search the same subject and therefore not retrieving all relevant and related material.

Some of the advantages in using controlled vocabularies include:

- **Ease of use and consistency in entering metadata:** software can be used to select values from a list, avoiding typing and preventing spelling mistakes.
- **Improved searching:** controlled vocabularies assist resources to be found more reliably by preventing mismatch, e.g. the metadata says 'child care' but the user searched for 'childcare'.
- **Supports browsing:** A controlled vocabulary can be used directly for browsing for resources.
- **Allows matching to other data:** Metadata which uses controlled vocabularies allows links to be made between similar items (e.g. find other records with the same terms), or (by way of a mapping) to make a connection between different types of items, for example finding all the resources which relate to a particular qualification.

It was noted by a number of focus group participants that there are a number of thesauri currently in use across the nation with different sectors preferring different thesauri. In relation to the EdNA project, VOCED (Vocational Education) has been identified as the preferred standard for the VET sector, whereas ATED (Australian Thesaurus of Education Descriptors) is the preferred standard for the Higher Education sector. Many participants felt that an agreed standard thesaurus for the VET sector would greatly improve resource discoverability.

Summary

This paper is the second of a suite of papers to be produced by the VET Learning Objects Repository Project. The first paper, released in June 2003, was a Green Paper for Discussion and was designed to facilitate discussion and consultation within the VET sector to define a set of guidelines on the development and use of learning object repositories. This second paper is a synthesis of a two-month consultative process following the release of the Green Paper.

Among the key findings of the consultative process was that while there has been much debate over the definition of what a learning object is, what is more important to the VET sector in general is the establishment of a set of characteristics which make exchange through repositories effective.

The consultative process also indicated that there needs to be a strong link between pedagogy and both the use and design of learning objects. Context was also highlighted as being an important component of the VET learning paradigm; however, highly contextualised learning resources tend to be less re-usable than their generic counterparts. It is recommended, therefore, that developers use a combination of contextualised and context neutral objects.

It is recognised that different organisations will want to implement repositories in different ways, either at a local, state or even national level. For local repositories, this may mean a single entry point or portal in which a user can elect to refine their search by selecting categories or topics as described in the Pyramid model. At a state or national level, this may mean a number of entry points to the repository with the higher the entry point the greater the depth and breadth of the search.

Metadata is an integral component to any repository and is the key to not only discoverability but also interoperability. There are currently two main metadata standards relevant to learning objects in the VET sector; EdNA Metadata Standard and the IEEE's Learning Object Metadata (LOM) Standard. The EdNA standard is currently in wide use in Australian education and is quite adequate for most VET applications. However, the LOM standard is useful for describing educational attributes and is the standard required for SCORM compliance. It is important that all potential repositories within the VET sector adhere to appropriate standards and abide by suitable minimum metadata requirements.

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