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Data Specification for the Definition of a Topic Map on Standards in E-learning

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Data Specification for the Definition of a Topic Map on Standards in E-learning

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I

Introduction

This document provides a definition of the content for the *QUIS Topic Map on E-learning Standards*, the web application [4].

We designed the present paper basing on [2] and [3] as for the basic concepts on topic maps, and on the QUIS Report on Standards for E-Learning [1], as the main content resource.

In this introductory section we give some basic definitions that should make more readable the rest of the paper.

In particular we

- Define the basic elements of the topic map, as the TOPIC and the ASSOCIATION, in which we include the bulk of the information to be delivered through the topic map (topics and associations are listed, respectively, in Sec. II and Sec. III).
- Explain the use of the topic ASSOCIATION TYPE, devised to better specify the association instances listed in Sec. II.
- State the way we specify, through Sec. II and Sec. III, the additional information (that will be properly included into the topic map by means of individual *occurrences*, while they are described differently here, for the sake of readability of the present document).

$7 + 6 + 13 + 11 + 38 + 22 + 7 + 6$ topics = 110

I.1 TOPIC

A topic defines an element of the topic map, for which a *name* has to be basically provided. For a topic one may want to specify the fact that it derives from another topic (i.e. it is of a certain *topic type*); in this case the topic is also called an “instance of a more general topic”.

In Sec. II we list the topics to be defined in the topic map, by specifying for each one the following fields:

- TOPIC NAME (the name that identifies the topic: for example, *Ariadne*)
- TOPIC TYPE (the name of the other topic of which the present topic is a more particular instance (for example, the topic *Ariadne* is an instance of the topic *Standard*)

- DESCRIPTION (textual content: the topic map user will be presented with this content, when needed)

As a matter of fact the description field would more properly stand as an *occurrence* (in particular as an “internal occurrence”, see the related subsection below): we decided to have it as a dedicated field in the topic definition, because we think that does improve the readability of the present paper; in other words, what is read here in the description fields will be properly represented as internal occurrences into the web application implementing the topic map.

I.2 ASSOCIATION

Associations are the way to define relations among topics in a topic map. When we define such a relation we have to specify

- what is the *name* of the relation,
- what topics are involved as *members* in the relation,
- and what each *members' role* is.

So, in Sec. III we list the associations to be included into the topic map, by specifying for each the following fields:

- TYPE (the name of the general relation of which this association is an instance, for example: *is standard component of*)
- MEMBER / ROLE (this is a couplet of fields: the members of the association are the topics that are actually in relation among them; for each of such topics, MEMBER carries the topic name and ROLE points out the role of that member in the relation: for example: MEMBER=*Scorm Cam Content Model* ROLE=*is Standard Component of*, and there will presumably be another couplet in this sample association with, say, MEMBER=*Scorm* ROLE=*containing Standard*)
- COMMENTS (comments giving some information about the association; for example, continuing the sample association in the previous fields, the comments here could be “*The Content Aggregation Model (CAM) is a component of the SCORM standard; it consists of four (sub-)components: Content Model, Content Packaging ,Meta-data, Sequencing and*”

Navigation.”)

According to the generally accepted basic definition of an association, we have to justify the use of the first field in the above definition framework. We devised the *type of the association* as the name of a topic, which is expected to define the name of the relation; such topic would then be used for the definition of all the correspondent associations.

To do that we had to define additional topics. The first of such topics is the one defining the concept of association type: here is its definition (reported also in section II)

TOPIC
TOPIC NAME
ASSOCIATION TYPE
TOPIC TYPE
-
DESCRIPTION
This topic is actually used just to define the concept of association type. It supports the definition of association types and, in turn, associations.

The other additional topics give the definitions for the various association types (relation names) used throughout Sec. III to define associations. For instance, the following definition (part of Sec. III) gives the definition of the relation *is standard component of*

TOPIC
TOPIC NAME
IS STANDARD COMPONENT OF
TOPIC TYPE
ASSOCIATION TYPE
DESCRIPTION
This shows that a certain topic (in fact a standard component) IS STANDARD COMPONENT of another topic (in fact a standard).

and the following definition (part of Sec III as well) gives an example of association instantiating the above relation

ASSOCIATION
ASSOCIATION TYPE
IS STANDARD COMPONENT OF
Member
SCORM CAM CONTENT MODEL
Member role
is component of
Member
SCORM
Member role
contains
COMMENTS
The Content Aggregation Model (CAM) is a component of the SCORM standard; it consists of four (sub-)components: Content Model, Content Packaging ,Meta-data, Sequencing and Navigation

I.3 OCCURRENCE

An occurrence is some information added about a topic; it can be *internal* (textual description) or *external* (a link to a resource, such as a file in a file system, an entry in a database, a web resource available through internet).

In order to make the material more readable in the present paper, we did not add an individual chapter to contain all the occurrences to be fed into the topic map web application. As mentioned earlier, the internal occurrences were all covered (and made more readable here) by definition of the *description* field of the topics. When it comes at the external occurrences, we decided to include them into the appropriate topic description fields, just adding a label, to make them individually identifiable during the process of topic map feeding. (in principle we would use, as labels, either “Occurrence – file”, or “Occurrence – db entry” or “Occurrence - web resource”; in the practice, as there is no database nor file repository in line with the topic map, all the occurrences are labeled as web resources)

II TOPICS

In this section we define the topics to be included into the topic map web application.

Sec. II.1 provides the definition of the topic types we devised (the last one, *association type*, as mentioned in the introduction, is instrumental to the definition of associations of Sec. III). Then (from Sec. II.2 through Sec. II.9) a subsection is dedicated to define, for each topic type, the related topics.

I.1 TOPIC TYPES

<i>TOPIC</i>
<i>TOPIC NAME</i> STANDARD <i>TOPIC TYPE</i> -
<i>DESCRIPTION</i> According to ISO, standards can be defined as "documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose". Since the advent of personal computer, digital technologies have of course become increasingly common in education -- both in distance and classroom-based education and training settings. However, these technologies have typically been applied in ad hoc and divergent forms. Innumerable courses, course modules and systems for managing and delivering the course material, have been developed independently of one another, quite often at cost of significant effort. Moreover, such content and systems are often partly or even completely unavailable to interchange and/or interoperation. For systems to interoperate they need to "understand" the data structures they share. Without a standardized specification each "data supplier" or "tools developer" would rather expect others to conform to its own data structure. This is much similar to a world wide web where each web site asks for a different browser to be enjoyed. The concept of "Standard" in e-learning addresses those shortcomings. There are four major advantages arising from the development and use of a standard, specifically in the field of e-learning:

Durability – no need for modification as versions of system software change.

Interoperability – operability across a wide variety of hardware, operating systems, web browsers and Learning Management Systems.

Accessibility – indexing and tracking on demand.

Reusability – possible modification and use by many different development tools.

These should apply to both the systems themselves and the contents/data/processes they manage.

In particular, in the terminology used in the e-learning field, educational resources are mainly referred to as “learning objects”.

A "learning object" designates something that is both an informational or interactive object and that has an evident educational application. Derived from the world of object-oriented programming, the term "object" connotes a resource that is modular, reusable, and capable of being integrated with other objects. Learning objects are intended as building blocks that can be combined in nearly infinite ways to construct collections that might be called lessons, modules, courses, or even curricula. There is no standard for the size (or granularity) of a learning object. Larger learning objects are typically harder to reuse, and smaller learning objects require more work to be combined and reused. The word "learning" appearing in the term "learning object" implies that a learning object must have at least one specifiable educational purpose or context.

A learning object could conceivably be implemented by any of a number of digital media. These media can include Java applets, Flash animations, and audio and video clips; but they can also take the form of more exclusively "informational" materials such as Web pages, Web sites, PDF documents, or PowerPoint presentations. Any of these resources can be used:

by teachers to augment classroom or online lessons

by students for remedial or independent study

by instructors or designers to construct online courses

by administrators for purposes of curriculum coordination.

The information given in the STANDARD topic description are excerpted from the introduction of QUIS report: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

Occurrence – web resource

http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

STANDARD COMPONENT

TOPIC TYPE

-

DESCRIPTION

The definition of a standard for e-learning may comprise an organization in several components. Each component manages different aspects of the learning material and processes (e.g., packaging, sequencing, assessment, etc.). For example the components of the SCORM standard are the Content Aggregation Model (CAM), the Run-Time Environment (RTE) and the Sequencing and Navigation (SN). The CAM above in turn consists of four components: among them the MetaData component

TOPIC

TOPIC NAME

STANDARDIZATION ORGANIZATION

TOPIC TYPE

-

DESCRIPTION

A standardization organization, also referred to as standards development organization or SDO, is any entity whose primary activities are developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise maintaining standards that address the interests of a wide base of users outside the standards development organization.

E-learning standard organizations investigate and develop reference models to encourage the adoption and advancement of e-learning.

Occurrence – web resource

A possible good definition of standardization organization: is on the wikipedia: http://en.wikipedia.org/wiki/Standards_organization

TOPIC

TOPIC NAME

DIGITAL REPOSITORY

TOPIC TYPE

-

DESCRIPTION

A repository is a central place where data is stored and maintained. A repository can be a place where multiple databases or files are located for distribution over a network, or a repository can be a location that is directly accessible to the user without having to travel across a network.

A Digital repository is either a local, institutional, or central (e.g., subject- or discipline-based) digital archive for depositing and providing access to digital contents.

Repositories of standard compliant resources for e-learning make available ready-to-use material for both instructional designers and teachers interested in providing on-line courses. Although it is possible to create standard compliant resources using the suited authoring tools, the most convenient organization for such resources and particularly for Learning Objects is to be collected into publicly (if not freely) available concentrations; the concept and role of a repository is just to implement such concentration.

TOPIC

TOPIC NAME

AUTHORING TOOL

TOPIC TYPE

-

DESCRIPTION

An authoring tool is a software application allowing to create and modify resources coded in a given format. As for e-learning standards, authoring tools are not the editors provided for producing the content, i.e. the rough resources (e.g. a pdf file) but rather “packagers” organizing both resources and related information in standard compliant modules.

TOPIC

TOPIC NAME

LEARNING MANAGEMENT SYSTEM

TOPIC TYPE

-

DESCRIPTION

A Learning Management System (or LMS) is a software package, that scale is decreasing rapidly), that enables the management and delivery of learning content and resources to students. Most LMSs are web-based to facilitate "anytime, anywhere" access to learning content and administration.

At a minimum, the LMS usually allows for student registration, the delivery and tracking of e-learning courses and content, and testing, and may also allow for the management of instructor-led training classes.

Some LMS vendors do not distinguish between LMS and LCMS, preferring to refer to both under the term "LMS", but there is a difference. The LCMS, which stands for "Learning Content Management System", facilitates organization of content from authoring tools, and presentation of this content to students via the LMS.

While most systems are commercially developed, free and open-source models do exist. Open source and Web-based LMS software solutions are growing fast in the education and business world.

Occurrence – web resource

Extended information at: http://en.wikipedia.org/wiki/Learning_management_system

TOPIC

TOPIC NAME

ASSOCIATION TYPE

TOPIC TYPE

-

DESCRIPTION

This topic is actually used just to define the concept of association type. It supports the definition of association types and, in turn, associations.

I.2 TOPICS (STANDARDIZATION ORGANIZATION)

TOPIC

TOPIC NAME

ADL

TOPIC TYPE

STANDARDIZATION ORGANIZATION

DESCRIPTION

The ADL (Advanced Distributed Learning) is a U.S. government-sponsored organization that investigates and develops specifications to encourage the adoption and advancement of e-learning. The purpose of the ADL is to ensure access to high-quality education and training materials.

The most widely accepted ADL publication is the ADL Shareable Content Object Reference Model (SCORM). The SCORM specification combines elements of IEEE, AICC and IMS specifications into a consolidated document that can be easily implemented. The ADL adds value to existing standards by providing examples, best practices and clarifications that help suppliers and content developers to implement e-learning specifications in a consistent and reusable way.

Occurrence – web resource

Further information about ADL can be found through the website <http://www.adlnet.org/scorm/index.cfm>

TOPIC

TOPIC NAME

IMS

TOPIC TYPE

STANDARDIZATION ORGANIZATION

DESCRIPTION

The IMS (Instructional Management Systems Global Consortium) is an international USA association of vendors, universities and implementers, focusing on the development of XML-based specifications for learning resources. These specifications describe the key characteristics of courses, lessons, assessments, learners and groups.

Occurrence – web resource

Further information about IMS and the related standard can be found through the website <http://www.imsglobal.org>

TOPIC

TOPIC NAME

IEEE

TOPIC TYPE

STANDARDIZATION ORGANIZATION

DESCRIPTION

The IEEE (Institute for Electrical and Electronics Engineers) is an international organization that develops technical standards and recommendations in technical areas ranging, for instance, from computer engineering to biomedical technology, from telecommunications to electric power, and from aerospace engineering to consumer electronics.

In the IEEE, the actual standardization organization in the area of e-learning, is the IEEE LTSC (Learning Technology Standards Committee), which developed the homonymous standard for learning material. Such standard specifies the syntax and semantics of Learning Object Metadata, defined as the attributes required to adequately describe a Learning Object.

The most widely acknowledged IEEE LTSC specification is the Learning Object Metadata (LOM) specification, which describe learning resources. The IEEE LOM standard has been approved in June 2002. Both IMS and ADL SCORM use the LOM elements and structures in their specifications.

Occurrence – web resource

Further information about the organization and the related standard specifications can be found through the website <http://ieeeltsc.org/wg12LOM/>

TOPIC

TOPIC NAME

DCMI

TOPIC TYPE

STANDARDIZATION ORGANIZATION

DESCRIPTION

The Dublin Core Metadata Initiative (DCMI) is an organization dedicated to developing

metadata vocabularies and promoting the adoption of interoperable metadata standards.
It delivers and maintain the Dublin Core standard

Occurrence – web resource

Further information about the organization and the related standard can be found through the website <http://dublincore.org>

TOPIC

TOPIC NAME

ARIADNE FOUNDATION

TOPIC TYPE

STANDARDIZATION ORGANIZATION

DESCRIPTION

The “ARIADNE Foundation for the European Knowledge Pool” is a european association involved in work related to technical specifications, most notably in the area of metadata, and to infrastructure for distributed network of learning repositories.

Occurrence – web resource

Further information about the organization and the related standard can be found through the website <http://www.ariadne-eu.org/>

TOPIC

TOPIC NAME

AICC

TOPIC TYPE

STANDARDIZATION ORGANIZATION

DESCRIPTION

Created in 1988, the AICC (Aviation Industry Computer Based Training Committee) is an international group of technology-based training professionals.

They create Computer Based Training (CBT) guidelines for the aviation industry.

They publish a variety of recommendations and Computer Managed Instruction (CMI) guidelines.

The AICC’s mission is to provide and promote information, guidelines and standards that

result in the effective implementation of CBT and Web Based Training (WBT).

Occurrence – web resource

Further information about the organization and the related standard can be found through the website <http://www.aicc.org>

I.3 TOPICS (STANDARD COMPONENT)

TOPIC

TOPIC NAME

METADATA

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

In the scope of e-learning standards, the term metadata stands for the additional information that is added to the rough resource (e.g. a word file) in order to describe it. The kind of such information, the way it is organized and the way it is attached to the resource file depend on the standard. So for example, in order to define a learning object we have to specify a certain set of information (type of content, time needed to learn, other connected resources, level of knowledge involved, ...). Such information are usually written and distributed under different categories, so to make possible and simpler its retrieval and use. Comparing the different approaches to the definition of metadata in the different standards, allows supporting the comparison of the expressiveness of different standards.

Occurrence – web resource

A possible definition of metadata: wikipedia: <http://en.wikipedia.org/wiki/Metadata>

TOPIC

TOPIC NAME

SCORM CAM

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM CAM (Content Aggregation Model) is the SCORM component including specifications on how resources and related information should be packed. It includes in turn four components: Content Model, Content Packaging, Meta-data, Sequencing and Navigation.

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM CAM CONTENT MODEL

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

The SCORM CAM Content Model describes the SCORM chunks used to build a learning experience, such as a course or module.

Chunks are of three types:

- Asset,
- Sharable Content Object,
- Content Organization.

Asset represents the lower level of learning resource to present to a learner; it may be a Web page, an XML document, an JPEG image, etc... More than one asset can be collected together to build larger assets.

A SCO is a collection of one or more Assets that utilizes the SCORM RTE to communicate with LMSs.

A Content Organization defines structured units of instruction- activities- that represent the learning content (for instance a course may be divided in more module and a module in more lessons).

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM CAM CONTENT PACKAGING

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM CAM Content Packaging defines the aggregation process for e-learning resources and a way to associate metadata to components.

SCORM Content Packaging consists of IMS Content Packaging, augmented by the requirement that a package has to be created as a PIF - Package Interchange File, a compressed archive file in the format PKZip v2.04g(zip).

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM RTE

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM RTE (RunTime Environment) specifies how content should behave once it has been launched by the LMS. It includes guidelines for the connection to a content archive, the communication with it and the retrieval of content. Such guidelines enable reusability of Learning Objects and interoperability through different SCORM-compliant LMSs.

Run-Time Environment consists of three components:

- Launch: The mechanism for defining a common way for LMSs to start Web-based learning resources.
- Application Programming Interface: provides a communication mechanism that allows the SCO to communicate with the LMS.
- Data Model: A standard set of data elements used to define the information being communicated, such as the status of the learning resource.

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM RTE LAUNCH

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM RTE Launch specifies the mechanism for defining a common way for LMSs to start Web-based learning resources. It defines the procedures and responsibilities for establishing the communication between the delivered learning resources and the LMS.

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM RTE APPLICATION PROGRAMMING INTERFACE

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM RTE Application Programming Interface provides a communication mechanism that allows the SCO to communicate with the LMS. It is assumed that once the SCO is launched it can then exchange information with an LMS. Any communication between the LMS and the SCO is initiated by the SCO. There is currently no mechanism supporting the LMSs in initiating calls to functions implemented by a SCO.

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM RTE DATA MODEL

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM RTE Data Model is a standard set of data elements used to define the information being communicated, such as the status of the learning resource. In its simplest form, the data model defines the set of information that both the LMS and SCO are expected to “know” about.

The LMS must maintain the state of required data elements across sessions. The purpose of establishing a common data model is to ensure that a defined set of information about SCOs can be tracked by different LMS environments.

Data Model is derived directly from the CMI (Computer Managed Instruction) Data Model as defined by AICC. AICC CMI Data Model defines sets of standardized data elements that can address most needs of information exchange between learning resources and LMSs. About this last aspect see some details in the AICC standard topic.

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

SCORM SN

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

SCORM SN (Sequencing and Navigation) defines a method for representing the different activities flows defined by a teacher for different students, based on their knowledge and skills.

The SCORM SN describes how a SCORM-conformant LMS interprets the sequencing rules expressed by a content developer along with the set of learner-initiated or system-initiated navigation events and their effects on the run-time environment.

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

IMS CONTENT PACKAGING

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

The IMS Content Packaging Specification defines how to describe (with metadata) and organize learning resources in packages.

An IMS Content Package contains two major components:

A special XML document called the manifest file (imsmanifest.xml) describing the content structure and associated resources of the package,

The physical files making up the content package.

Occurrence – web resource

Information on this topic can be found in Sec.2.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.imsglobal.org>

TOPIC

TOPIC NAME

IMS QTI

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

IMS QTI (Question & Test Interoperability) is a set of guidelines which describe how to share both single tests and complete evaluation tests and data. It allows representation of different type of questions, definition of feedback and computation of results.

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.imsglobal.org>

TOPIC

TOPIC NAME

IMS LD

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

IMS LD (Learning Design) specification is a language for modelling units of study. Its purpose is to provide a kind of abstraction for the description of learning processes, offering constructs suited for different pedagogical approaches. So the language enables pedagogical diversity to be supported through the implementation of a single engine. Moreover, it is designed to promote exchange and interoperability of e-learning materials, associating educational content with information describing its instructional strategy.

The IMS Learning Design Best Practice and Implementation Guide states that the core concept of the Learning Design Specification “is that regardless of pedagogical approach,

a person gets a role in the teaching/learning process, typically a learner or a staff role. In this role he or she works toward certain outcomes by performing more or less structured learning and/or support activities within an environment. The environment consists of the appropriate learning objects and services to be used during the performance of the activities. Which role gets which activities at what moment in the process, is determined by the method or by a notification.”

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.imsglobal.org>

Occurrence – web resource

Information on this topic can be found in Sec.2.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

IMS SIMPLE SEQUENCING

TOPIC TYPE

STANDARD COMPONENT

DESCRIPTION

The IMS Simple Sequencing specification describes how to organize the learning objects and present them to learners. The specification should guarantee major control about learning course.

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.imsglobal.org>

I.4 TOPICS (STANDARD COMPONENT, METADATA)

TOPIC

TOPIC NAME

SCORM CAM METADATA

TOPIC TYPE

METADATA

DESCRIPTION

SCORM uses IEEE Learning Object Metadata (LOM) to describe each Content Model component (Asset, SCO and Content Organization) or package as a whole.

These metadata are defined in an XML file and may be stored within or outside the package.

The IEEE LOM Information Model is broken up into nine categories. Such categories are based on the definitions found in the model itself. The nine categories of meta-data elements are:

General category: can be used to describe general information about the SCORM Content Model Component as a whole.

Life Cycle category: can be used to describe features related to the history and current state of the SCORM Content Model Component and to those who have affected the component during its evolution.

Meta-metadata category: can be used to describe information about the metadata record itself (rather than the SCORM Content Model Component that the record describes).

Technical category: can be used to describe technical requirements and characteristics of the SCORM Content Model Component.

Educational category: can be used to describe the educational and pedagogical characteristics of the SCORM Content Model Component.

Rights category: can be used to describe the intellectual property rights and conditions of use for the SCORM Content Model Component.

Relation category: can be used to describe features that define the relationships between this SCORM Content Model Component and other targeted components.

Annotation category: can be used to provide comments on the educational use of the SCORM Content Model Component and information on when and by whom the comments were created.

Classification category: can be used to describe where the SCORM Content Model Component falls within a particular classification system.

(For details see LOM section)

Occurrence – web resource

Sharable Content Object Reference Model (SCORM) 2004 3rd Edition Documentation Suite Public Draft: <http://www.adlnet.gov/downloads/290.cfm>

Occurrence – web resource

Information on this topic can be found in Sec.1.3 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

IMS METADATA

TOPIC TYPE

METADATA

DESCRIPTION

IMS Metadata is based on IEEE LOM and Dublin Core metadata. For details see LOM and Dublin Core topics.

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.imsglobal.org>

TOPIC

TOPIC NAME

IEEE LOM METADATA

TOPIC TYPE

METADATA

DESCRIPTION

LOM defines a Base schema that specifies a hierarchy of data elements for learning objects metadata. At the top level of the hierarchy there are nine categories:

- The General category groups the general information that describes the learning object as a whole.

- The Lifecycle category groups the features related to the history and current state of this learning object and those who have affected this learning object during its evolution.
- The Meta-Metadata category groups information about the metadata instance itself (rather than the learning object that the metadata instance describes).
- The Technical category groups the technical requirements and technical characteristics of the learning object.
- The Educational category groups the educational and pedagogic characteristics of the learning object.
- The Rights category groups the intellectual property rights and conditions of use for the learning object.
- The Relation category groups features that define the relationship between the learning object and other related learning objects.
- The Annotation category provides comments on the educational use of the learning object and provides information on when and by whom the comments were created.
- The Classification category describes this learning object in relation to a particular classification system.

Occurrence – web resource

A little deeper description of LOM is in the IEEE LOM website at page:
<http://ltsc.ieee.org/wg12/>

Occurrence – web resource

Information on this topic can be found in Sec.3.4 of the report “Standards for e-learning”, WP5 report, QUIS Project: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

TOPIC

TOPIC NAME

DUBLIN CORE METADATA

TOPIC TYPE

METADATA

DESCRIPTION

Dublin Core Metadata defines 15 optional elements to describe digital materials on the web. Elements are:

- Title (the name given to the resource by the creator or publisher),
- Creator (people or organizations that have contributed to create the resource),
- Subject (the topic of the resource, or keywords, phrases, or classification descriptors that describe the subject or content of the resource),
- Description (textual description of the resource),
- Publisher (the entity responsible for making the resource available in its present form, such as a publisher, a university department, or a corporate entity),
- Contributor (person(s) or organization(s) in addition to those specified in the creator element who have made significant intellectual contributions to the resource, but whose contribution is secondary to the individuals or entities specified in the creator element.),
- Date (date of creation or publication of resource),
- Type (category of resource),
- Format (data format),
- Identifier (string or number used to uniquely identify the resource such as URN),
- Source (the work, either print or electronic, from which this resource is delivered)
- Language (used language),
- Relation (contains identifier of a related resource),
- Coverage (time and space characteristics of resource)
- Rights (defines property rights and conditions of use).

Occurrence – web resource

The Dublin Core Metadata Initiative provides access to schemas defining DCMI term declarations represented in various languages such as XML and RDF.
<http://dublincore.org/schemas/>

TOPIC

TOPIC NAME

ARIADNE METADATA

TOPIC TYPE

METADATA

DESCRIPTION

Metadata are grouped into six categories:

General (general information that describe the learning object such as title and language),

Semantics (groups elements that describe the semantic classification of the learning

object like the science type, main discipline, etc...),
 Pedagogical (describes the pedagogic and educational characteristics of the learning object such as semantic density and interactivity level),
 Technical (describes the technical requirements and characteristics of the learning object such as OS version),
 Indexation (describes the general information about the metadata itself of the learning object such as metadata creation date and creator),
 Annotations (describes people or organizations notes about the learning object).

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.ariadne-eu.org/>

I.5 TOPICS (STANDARD)

TOPIC

TOPIC NAME

SCORM

TOPIC TYPE

STANDARD

DESCRIPTION

ADL Shareable Content Object Reference Model (SCORM). The SCORM specification combines elements of IEEE, AICC and IMS specifications into a consolidated set of guidelines that can be easily implemented. The ADL adds value to existing standards by providing examples, best practices and clarifications that help suppliers and content developers to implement e-learning specifications in a consistent and reusable way.

Occurrence – web resource

A little deeper description of SCORM can be found in the related Chapter in the QUIS report: http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.adlnet.org/scorm/index.cfm>

TOPIC

TOPIC NAME

IMS

TOPIC TYPE

STANDARD

DESCRIPTION

The scope for IMS specifications, broadly defined as "distributed learning," includes both online and off-line settings, taking place synchronously (real-time) or asynchronously. This means that the learning contexts benefitting from IMS specifications include Internet-specific environments (such as web-based course management systems) as well as learning situations that involve off-line electronic resources (such as a learner accessing learning resources on a CD-ROM). The learners may be in a traditional educational environment (school classroom, university), in a corporate or government training setting, or at home. For example, the IMS Learning Resources Meta-data Specification (www.imsglobal.org/metadata), benefits the learner looking for information with a meta-data aware search tool both when the search is of web-based resources and when she or he is searching through a CD-ROM or DVD-ROM encyclopedia in their computer at home. Content developers who have implemented the IMS Learning Resources Meta-data Specification will have made it much easier for the people doing the search to find the resources they want in a much more efficient way, since meta-data allows users to be much more specific in the search terms they can specify.

The IMS standard currently consists of the following components:

Meta-data: the core elements to be used for describing Learning material

Content Packaging: description of the aggregation structure of learning resources into courses or parts of courses

Question & Test Interoperability

Learning Design

Simple Sequencing

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.imsglobal.org>

TOPIC

TOPIC NAME

IEEE LOM

TOPIC TYPE

STANDARD

DESCRIPTION

The IEEE (Institute for Electrical and Electronics Engineers) is an international organization that develops technical standards and recommendations in technical areas ranging from computer engineering, biomedical technology and telecommunications, to electric power, aerospace engineering and consumer electronics, among others. IEEE LTSC is the Learning Technology Standards Committee of IEEE. The most widely acknowledged IEEE LTSC specification is the Learning Object Metadata (LOM) specification, which describe learning resources. The IEEE LOM standard has been approved in June 2002. Both IMS and ADL SCORM use the LOM elements and structures in their specifications.

Details about the standard and all related documents can be found at <http://ieeeltsc.org/wg12LOM/>

As stated by LTSC defining committee, the goals of the standard are:

- To enable learners or instructors to search, evaluate, acquire, and utilize Learning Objects.
- To enable the sharing and exchange of Learning Objects across any technology supported learning systems.
- To enable the development of learning objects in units that can be combined and decomposed in meaningful ways.
- To enable computer agents to automatically and dynamically compose personalized lessons for an individual learner.
- To enable, where desired, the documentation and recognition of the completion of existing or new learning & performance objectives associated with Learning Objects.
- To enable a strong and growing economy for Learning Objects that supports and sustains all forms of distribution: non-profit, not-for-profit and for profit.
- To enable education, training and learning organizations, both government, public and private, to express educational content and performance standards in a standardized

format that is independent of the content itself.

- To provide researchers with standards that support the collection and sharing of comparable data concerning the applicability and effectiveness of Learning Objects.
- To define a standard that is simple yet extensible to multiple domains and jurisdictions so as to be most easily and broadly adopted and applied.
- To support necessary security and authentication for the distribution and use of Learning Objects.

Occurrence – web resource

Details about the standard and all related documents can be found at <http://ieeeltsc.org/wg12LOM/>

TOPIC

TOPIC NAME

DUBLIN CORE

TOPIC TYPE

STANDARD

DESCRIPTION

The Dublin Core Metadata Initiative provides simple standards to facilitate the finding, sharing and management of information.

Occurrence – web resource

Detailed information can be found at: <http://dublincore.org>

TOPIC

TOPIC NAME

ARIADNE

TOPIC TYPE

STANDARD

DESCRIPTION

ARIADNE Standard exploits and further develops the results of the ARIADNE and ARIADNE II European Projects, which created tools and methodologies for producing, managing and reusing computer-based pedagogical elements and telematics supported

training curricula.

Validation of the tools and concepts took place in various academic and corporate sites across Europe and was encouraging enough to go ahead with this idea of non-commercial exploitation..

Occurrence – web resource

Details about the standard and all related documents can be found at <http://www.ariadne-eu.org/>

I.6 TOPICS (AUTHORING TOOL)

AUTHORING TOOL: SCORM

<i>TOPIC</i>	
<i>TOPIC NAME</i> AltEd Global Project	
<i>TOPIC TYPE</i> AUTHORING TOOL	
	<i>DESCRIPTION</i>
	AltEd Inc. provides an authoring tool named AltEd 4.0 plus, an IMSmanifest & Metadata generator named AltEd SCORM Editor 1.2, and a Learning Content Management System(LCMS) named AltEd SCORM LCMS. All the products are based on SCORM standard. It is not free.
Occurrence – web resource	
Details about this topic are found at http://www.alted.com/SCORM/index.asp	

<i>TOPIC</i>	
<i>TOPIC NAME</i> Design a Course Author	
<i>TOPIC TYPE</i> AUTHORING TOOL	
	<i>DESCRIPTION</i>

It is a tool which does not require to learn programming or scripting languages.
It provides four different types of questions with feedback and question timing.
It allows to create courseware that can be exported to a SCORM 1.2 or SCORM 2004 compliant LMS.
It is not free.

Occurrence – web resource

Details about this topic are found at <http://www.mindiq.com/elearning/dac/stand-alone.php>

TOPIC

TOPIC NAME

E-learning Consulting SCORM Tools

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

E-learning Consulting provides:
Manifest Maker -A Free Dreamweaver extension to quickly and easily create a SCORM 1.2 Manifest.
SCORM Visualizer- SCORM Visualizer lets you see how a course and a Learning Management System (LMS) use the SCORM 1.2 Runtime to communicate. It is not free.
Flash Course Development Toolkit – This toolkit allows to create SCORM-based e-learning courses with Flash. It supports SCORM 1.2. It is not free.
Test Builder- This tool allows to create SCORM-based tests and quizzes with true-false, multiple choice, fill-in-the-blank and matching questions. No programming is required.

Occurrence – web resource

Details about this topic are found at <http://www.e-learningconsulting.com/products/index.html>

TOPIC

TOPIC NAME

Exe 0.6 release

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is an open source SCORM/IMS authoring tool.

Occurrence – web resource

Details about this topic are found at <http://exelearning.org/>

TOPIC

TOPIC NAME

E-learning authoring tool

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

This tool lets you use your favourite HTML editor to create e-learning courses quickly and easily.

The Kit fully supports SCORM 1.2. Courses developed with the Kit will pass the SCORM conformance test. The Kit can be used to create content in multiple languages.

It is not free.

Occurrence – web resource

Details about this topic are found at <http://www.gold-software.com/eLearningAuthoringTool-review10077.htm>

TOPIC

TOPIC NAME

Lersus easyContent

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

LERSUS is a software product that allows creating interactive tutorials, computer training courses (CBT), and e-learning courses (WBT) according to the existing e-learning standards.

LERSUS supports the creation of descriptive interactive tutorials intended for e-learning via Internet, local area network, or by means of a Learning Management System (LMS). LERSUS allows creating tests to check the knowledge and including them into the interactive materials.

It supports IMS QTI and SCORM.

It is not free.

Occurrence – web resource

Details about this topic are found at <http://www.lersus.com/>

TOPIC

TOPIC NAME

Macromedia Authorware 7.0

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

Authorware Learning Object Metadata Editor is available at http://www.macromedia.com/devnet/authorware/articles/metadata_editor.html. It allows to define metadata of SCORM content packaging in standardized format.

It is not free but It is possible to download a trial version.

Occurrence – web resource

http://www.macromedia.com/devnet/authorware/articles/metadata_editor.html

TOPIC

TOPIC NAME

Metadata Generator Pro

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

Metadata Generator Pro allows the user to create, import, and export SCORM 1.2 conformant metadata files. Users may also import, edit, and validate any existing SCORM 1.2 metadata file.

There are limitations of free version: 5 user trial.

Occurrence – web resource

Details about this topic are found at <http://downloads-zdnet.com.com/Metadata-Generator-Pro/3000-2383-10297484.html>

TOPIC

TOPIC NAME

SCORM 1.2 Player

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

The SCORM Player is developed at Bolton Institute by Paul Sharples and Phillip Beauvoir.

The current version supports ADL SCORM 1.2 and is free.

Occurrence – web resource

<http://www.reload.ac.uk/SCORMplayer.html>

TOPIC

TOPIC NAME

SCORM 1.2 Resource Kit

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

The Click2learn SCORM 1.2 Resource Kit is an evolving set of documents and demonstration applications.

The Kit includes:

SCORM 1.2 Package Aggregator- A visual aggregator that assembles SCORM 1.2 content aggregation packages into larger SCORM 1.2 content packages. It also includes a user-friendly metadata editor for the metadata for the new aggregated package and limited on-line help to support the workflow.

SCORMisizer - This "SCORMisizer" wizard will turn a single document or other digital resource into a SCORM 1.2 package in few easy steps. No XML editing is required.

SCORM API Exerciser- The SCORM API exerciser is a tool to exercise and explore the SCORM API. It is a single HTML page, but it works only if launched as a SCO in a SCORM conformant runtime environment.

Occurrence – web resource

<http://academiaelearning.com/contenido/SCORM/cooking/index.html#aggregator>

TOPIC

TOPIC NAME

Visual Course Builder

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

The VCB tool has been developed from the ground up with the goal of supplying a powerful multimedia development tool with an intuitive interface that an average Windows user can operate after a short training session.

The VCB has the most common e-learning user interface features pre-designed such as built navigation, progress bar, menus, tracking (AICC / SCORM), graphic editors, interaction editors....

It is possible to deliver the content through any browser and without plug-ins unless external media that requires a plug-in.

It is possible to download a trial version.

Occurrence – web resource

Details about this topic are found at <http://www.maxit.com/content/view/48/222/>

AUTHORING TOOL: IMS

TOPIC

TOPIC NAME

Alfanet QTI Tools

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

ALFANET QTI Tools consists of two tools: Author and Engine.

ALFANET QTI Author Tool provides course designers with a facility to define metadata associated with pre-existing items (QTI compliant) and generate dynamic assessments (tests) using selection & ordering specification.

ALFANET QTI Engine is an interpreter of IMS-QTI Specification. It provides an integrated tool for the presentation of tests (assessments) integrating one or more questions (items), and their evaluation providing the corresponding results reports.

It's free.

Occurrence – web resource

<http://rtd.softwareag.es/alfanetqtitools/index.html>

TOPIC

TOPIC NAME

Elicitus Content Publisher

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

This tool supports SCORM 1.2 and AICC.

It is possible to download a free evaluation copy usable for 30 days.

<http://www.elicitus.com/>

Occurrence – web resource

<http://www.elicitus.com/>

TOPIC

TOPIC NAME

IMS Assesst Designer

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

IMS Assesst Designer allows the authors to easily create, modify, delete and rearrange questions in assessments. This complies with open standards such as the IMS Project Question and Test Interoperability (QTI) Specification.

Assessment data can be exported and imported in zipped files according to IMS QTI specification.

It is free.

Occurrence – web resource

Details about this topic are found at <http://www.gold-software.com/IMSAssesstDesigner-review14971.htm>

TOPIC

TOPIC NAME

wizBuilder

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

Using this tool it is possible to create SCORM 1.2 compliant course content.

Occurrence – web resource

http://www.cyberwisdom.net/en/html/products/authoring_tool.asp

TOPIC

TOPIC NAME

Komposer

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is an authoring tool for editing IMS Learning Design Content Packages, and plans to extend this to IMS Learning Design.

It is free.

Occurrence – web resource

http://www.unfold-project.net:8085/UNFOLD/general_resources_folder/tools/komposer/komposeraug04

TOPIC

TOPIC NAME

IMSEVIMSE: the IMS editor VIMSE

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

ImseVimse is a full-fledged graphical IMS metadata editor written in Java.
It is free.

Occurrence – web resource

<http://kmr.nada.kth.se/imsevimse/>

TOPIC

TOPIC NAME

RapidExam™ v2.5 Deluxe

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It allows to create exams in a variety of different media formats, including EXM (native file format), XML, EXE, IMS QTI, and SCORM.

It is possible to download an evaluation copy for Windows at.
http://www.xstreamsoftware.com/rapidexam_description.htm

Occurrence – web resource

http://www.xstreamsoftware.com/rapidexam_description.htm

AUTHORING TOOL, IEEE LOM

TOPIC

TOPIC NAME

LOM-Editor

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It' a free LOM editor, vailable at <http://www.multibook.de/lom/en/index.html>.

TOPIC

TOPIC NAME

TreeLom

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

TreeLom is one of the LOM editing tools developed in .NET platform. It supports LOM Draft Standard. Currently two bindings models have been defined for LOM. They are XML and RDF binding of LOM. TreeLom is an editor that applies XML binding of LOM with a tree view editing functionality.

It is free.

Occurrence – web resource

<http://cebeciz.cu.edu.tr/tools/treelom/>

TOPIC

TOPIC NAME

Automatic Metadata Generation Framework

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

This open source framework is written in Java. It may be used as a web application or standalone.

If used standalone it allows to create metadata in LOM and DUBLIN CORE format.

Occurrence – web resource

<http://www.cs.kuleuven.ac.be/~hmdb/amg/builds.php>

AUTHORING TOOL: DC

TOPIC

TOPIC NAME

DC-assist

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

DC-assist is a utility for metadata written in Javascript. It provides examples, comments and various links.

It is free.

Occurrence – web resource

<http://www.ukoln.ac.uk/metadata/dcassist/>

TOPIC

TOPIC NAME

DC-dot

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a template to retrieve a Web page and automatically generate Dublin Core metadata, either as HTML <meta> tags or as RDF/XML.

It is available at <http://www.ukoln.ac.uk/metadata/dcdot/>

Occurrence – web resource

<http://www.ukoln.ac.uk/metadata/dcdot/>

TOPIC

TOPIC NAME

Dublin Core Metadata Template

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

A simple template for the creation of Dublin Core metadata.

It is available at page <http://www.lub.lu.se/cgi-bin/nmdc.pl>

Occurrence – web resource

<http://www.lub.lu.se/cgi-bin/nmdc.pl>

TOPIC

TOPIC NAME

EUC metadata tool

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a template which allow to produce Dublin Core standard compliant metadata.

Occurrence – web resource

<http://www.lub.lu.se/EUC/tool/euc.pl>

TOPIC

TOPIC NAME

Metadata Generator

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

With this tool it is possible to create meta tags based on the Dublin Core Specifications and to simply add information to fields.

Occurrence – web resource

<http://www.artsit.unimelb.edu.au/metadata/>

TOPIC

TOPIC NAME

Meta Tag Editor

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It allows editing of Dublin Core meta tags. Some screenshots can be viewed at page http://net-promoter.com/pagepromoter/help/meta_editor.html.

It is not free.

Occurrence – web resource

http://net-promoter.com/pagepromoter/help/meta_editor.html

TOPIC

TOPIC NAME

Mozilla Firefox Dublin Core Viewer Extension

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

This extension adds a button to the browser's status bar (and, optionally, the toolbar) to access an overview list of Dublin Core Metadata embedded in HTML/XHTML documents with META and LINK elements.

It is free.

Occurrence – web resource

<http://www.splintered.co.uk/experiments/73/>

TOPIC

TOPIC NAME

MyMetaMaker

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a template which allows to produce Dublin Core standard compliant metadata to markup websites of Research Groups and Institutions. The output of the provided scripts produces the html source for the header of the webpage.

Occurrence – web resource

http://www.marenet.de/MareNet/mmm_groups.html

TOPIC

TOPIC NAME

Reggie - The Metadata Editor

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is an applet which requires the use of the latest browser from either Netscape or Microsoft.

Occurrence – web resource

<http://metadata.net/dstc/>

TOPIC

TOPIC NAME

TagGen Office - Dublin Core Editor

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a part of TanGen Office, a complete software for developing metadata. A trial version can be downloaded at page http://www.hisoftware.com/fact_sheetcc.htm.

Occurrence – web resource

http://www.hisoftware.com/fact_sheetcc.htm

TOPIC

TOPIC NAME

The EULER Dublin Core Metadata Template

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a template which allows to produce metadata compliant to Dublin Core standard.

Occurrence – web resource

<http://euler.lub.lu.se/mdc/creator.cgi>

AUTHORING TOOL: AICC

TOPIC

TOPIC NAME

Istruendo Kit Authoring

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a module of the package Istruendo Authoring. It provides tools to create AICC compliant contents.

It is not free.

Occurrence – web resource

<http://www.fabbricadigitale.it/attivita/elearning-offerta-Authoring.html>

TOPIC

TOPIC NAME

Course Authoring Tool

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

The Course Authoring Tool, a quick, easy-to-use course-authoring tool, enables training managers and instructors to develop new courses or modify existing ones. It is web-based and compliant with AICC/SCORM standards for content management.

It is not free.

Occurrence – web resource

<http://www.emind.com>

TOPIC

TOPIC NAME

Authoring Pro

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

Authoring Pro is an authoring and publishing software. It is universally interoperable with learning management systems based on SCORM, AICC and LRN standards. It is not free but it is possible to download a trial version.

It is not free.

Occurrence – web resource

<http://www.pro-ductivity.com/authoringpro/>

TOPIC

TOPIC NAME

AICC File Editor

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

This tool allows to open and edit any set of AICC descriptor files in a graphical interface. The program also contains explanations of each AICC field.

It is free.

Occurrence – web resource

http://www.leftbrainmedia.com/tools_intro.html

TOPIC

TOPIC NAME

Lectora

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

Lectora is an AICC, LRN, SCORM conformant authoring tool. It is not free but a trial version is available.

It is not free.

Occurrence – web resource

http://www.lectora.com/product_info_overview.html

TOPIC

TOPIC NAME

SyberWorks Web Author

TOPIC TYPE

AUTHORING TOOL

DESCRIPTION

It is a Web-based training course authoring tool. By using SyberWorks Web Author it is possible to create Web-based AICC/SCORM compliant training courses with audio, video, software demonstrations, and much more.

It Requires no prior programming knowledge, automatically builds pre-test, post-test, and lesson feedback sections and allows to insert, delete, re-design, and re-order lessons

It is not free but it is possible to download a trial version.

It is not free.

Occurrence – web resource

http://www.syberworks.com/product_sa.htm

I.7 TOPICS (LEARNING MANAGEMENT SYSTEM)

TOPIC

TOPIC NAME

BLACKBOARD

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

This popular commercial LMS is SCORM 1.2 compliant. It is entirely web based and the users do not need to install client software. It offers a number of interesting features to the instructor and students. Blackboard has a student tracking feature which allows the instructor to monitor student progress. It also has assessment tools which help the instructor to create assignments and quizzes and automatically grade them.

Occurrence – web resource

Details about this topic are found at <http://www.blackboard.com>

Occurrence – web resource

http://www.blackboard.com/docs/AS/Bb_Learning_System_Brochure.pdf.

TOPIC

TOPIC NAME

CONTENTO LMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

Contento supplies an integrated system for the assembly and distribution of training content and the management of users connected to the system.

It is particularly easy to use and does not require any specialized technical knowledge. It isn't free. It is SCORM 1.3 compliant.

Occurrence – web resource

<http://www.bitness.it/Company.htm>

TOPIC

TOPIC NAME

DLMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

DLMS is a web-based system for courseware delivery implemented by Education spa. It can deliver any kind of multimedia content conforming to the supported standard.

It offers:

- delivery environments
- collaborative environment (chat, forum),
- compatibility with the more popular e-learning standards,
- portability on different operating systems (Windows, Linux),
- student's personal area,
- user tracking.

It is SCORM/AICC/IMS compliant.

Occurrence – web resource

<http://www.e-ducation.it/html/dlms.html>

TOPIC

TOPIC NAME

DOCEBOLMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

This LMS (known earlier as SpaghettiLearning) is SCORM 1.2 compliant and open source. It manages different formative models: from collaborative didactic to self-training. DoceboLMS is written in Php and MySql and can work on whichever server

(Linux, Windows, Mac OSX).

Occurrence – web resource

<http://www.docebolms.org/>

TOPIC

TOPIC NAME

DOKEOS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

Dokeos is an open source LMS developed using PHP, Apache and MySQL technologies. It is translated in 31 languages. It allows the trainer to create educational content, to structure activities in learning paths, to interact with students and to follow their evolution through a reporting system.

Occurrence – web resource

<http://www.dokeos.com/>

TOPIC

TOPIC NAME

A.M.I.C.A

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

It was implemented in 2004 by Didael spa, and is an interactive solution to learn English. It addresses all types of users. It allows to make interactive exercises, to see a video, etc...

Students can:

- verify own knowledge and choose start level (Placement Test),
- plan own study times (Study Planner),
- known own advancement state.

Teachers can:

- define courses,
- control access to resources,
- control students' activity.

It isn't free but it is possible to access it for 15 days through a registration to a "guided visit". It's SCORM 1.2 compliant.

Occurrence – web resource

<http://www.didael.it>

TOPIC

TOPIC NAME

E-learning Consulting LMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

This LMS manages the delivery of self-paced, e-learning courses. It lets publish courses and place them in an online catalogue. The LMS provides online reports for each course and learner.

It is browser-based and fully supports SCORM 1.2.

It is not free but It is possible to download a 14-day trial version.

Occurrence – web resource

<http://www.e-learningconsulting.com/products/learning-management-system.html>

TOPIC

TOPIC NAME

Inquisiq EX

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

This LMS is SCORM 1.2 and SCORM 1.3 (2004) Compliant.
It is not free. It is possible to download a 30 days trial version.

Occurrence – web resource

<http://www.icslearninggroup.com/products/inquisiq/learning-management-system.htm>

TOPIC

TOPIC NAME

Ilias

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

It is an open source web-based LMS. It consists in tools for creation and learning of contents. It allows users to create, edit and publish learning and teaching material in an integrated environment with their normal web browsers.

ILIAS has reached and is also AICC compliant.

Occurrence – web resource

www.ilias.de

TOPIC

TOPIC NAME

LearnerWeb

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

LearnerWeb is 100% browser based with enterprise level scalability and support for emerging/open standards including AICC, SCORM, XML, SQL and Web Services.

LearnerWeb can manage and track any type of training an organization may offer including on-line, classroom, on-the-job, off-site seminars, lending library, and general learning resources at an unlimited number.

LearnerWeb conforms to the following standards/models: AICC 1, AICC 2 and SCORM 1.2. It is not free.

Occurrence – web resource

<http://www.maxit.com/content/view/30/224/>

TOPIC

TOPIC NAME

Learning Space

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

It is a complete and flexible platform, implemented by IBM. It allows courses delivery in both asynchronous and synchronous fashion through a browser such as Internet Explorer or Netscape. Courses access is regulated by an internal registration process.

The student can:

- access subscribed courses through authentication,
- manage email through an internal platform service,
- send files (for instance in discussion forums),
- participate to online test sessions,
- exploit self-assessment activities,
- search a particular course content ,
- communicate with others users through chat, e-mail and forum.

The teacher can:

- plan courses to publish,
- define and publish tests,

verify students performances.

LearningSpace is IMS and SCORM compliant.

It is a commercial product.

Occurrence – web resource

<http://www.lotus.com/lotus/offering3.nsf/wdocs/learningspacehome>

TOPIC

TOPIC NAME

MOODLE

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

It is an open source LMS and it is SCORM compliant.

Some features:

forum

easy update of course's contents

personalization of the layout of specified courses

the teacher only sets up access option to courses.

Occurrence – web resource

<http://www.moodle.org>

TOPIC

TOPIC NAME

TrainCaster LMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

TrainCaster Learning Management System (LMS) is conformant to SCORM Version 2004. The learning management system has been tested using the ADL SCORM Conformance Test Suite Version 1.3.2.

It is not free but it is possible to download a 30 day trial version.

Occurrence – web resource

<http://www.traincaster.com>

TOPIC

TOPIC NAME

TinyLMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

TinyLMS is a learning management system for SCORM compliant learning content.

In particular It is conformant to SCORM 1.2.

No server-side software is needed.

TinyLMS supports layered organization of learning content in addition to the hierarchical organization specified by SCORM.

It is free.

Occurrence – web resource

<http://www.randelshofer.ch/tinylms/download.html>

TOPIC

TOPIC NAME

WEBCT

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

This LMS is SCORM 1.2 compliant. It is a commercial product.

Occurrence – web resource

<http://www.webct.com>

TOPIC

TOPIC NAME

TopClass E-learning Suite

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

The TopClass e-learning Suite includes both a Learning Management System and a Learning Content Management System that is SCORM Version 1.2.compliant.

It is not free.

Occurrence – web resource

http://www.vr.com.au/elearn_prod_lms.html

TOPIC

TOPIC NAME

ATUTOR

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

It is an open source web-based Learning Management System (LMS) .

It allows to export content from ATutor as IMS/SCORM conformant Content Packages.

Entire courses, or individual course units can be packaged for viewing or redistribution.

Content from other compliant systems can be imported into ATutor.

In particular it is possible to create three different types of courses:

Private (accessible only by users with an account and with teacher's approval)

Protected (accessible only by users with an account)

Public (accessible by anyone).

Occurrence – web resource

<http://www.atutor.ca/atutor/index.php>

TOPIC

TOPIC NAME

CLAROLINE

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

Claroline is a free application based on PHP /MySQL. It is translated in 30 languages. The software is released under Open Source licence (GPL).

Claroline is compatible with Windows, Macintosh and Linux environments. It integrates the current standards like SCORM and IMS for a fast and simple integration of learning contents in learning sequences.

Occurrence – web resource

<http://www.claroline.net>

TOPIC

TOPIC NAME

OPENLMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

OpenLMS now supports English (core language) and Norwegian. It is SCORM and Dublin Core compliant. It is open source.

This system supports group collaboration, file sharing, distribution of lectures, distributing lecture notes to groups of students, and also facilitates collaboration for groups of students and teachers.

Occurrence – web resource

<http://openlms.sourceforge.net/>

TOPIC

TOPIC NAME

Pathlore LMS

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

Pathlore LMS is certified by the AICC. It is a functionally rich, secure, web-based application that automates all processes associated with learning management administration.

Occurrence – web resource

<http://www.pathlore.com/products/index.asp>

TOPIC

TOPIC NAME

University360 Learning Management System

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

University360 Learning Management System is SCORM and AICC compliant. This platform works alone or as a component of University360 to help you create and manage e-learning solutions. It is not free.

Occurrence – web resource

<http://www.rwd.com/products/elearningmanagementsystems/university360lms/>

TOPIC

TOPIC NAME

WBT MANAGER

TOPIC TYPE

LEARNING MANAGEMENT SYSTEM

DESCRIPTION

WBT Manager is an AICC compliant LMS designed exclusively to organize, deploy, and track web-based training content. It is available in different languages. It is possible to download a trial version.

Occurrence – web resource

<http://www.ielearning.com/wbt/index.cfm>

I.8 TOPICS (DIGITAL REPOSITORY)

TOPIC

TOPIC NAME

INTRALIBRARY

TOPIC TYPE

DIGITAL REPOSITORY

DESCRIPTION

This web-based application is not free. It is designed to allow storage and retrieval of learning objects.

It allows IMS/LOM metadata editing, import/export of IMS/LOM metadata and export of Dublin Core metadata, import / export of learning objects conformant to IMS and SCORM specifications.

Occurrence – web resource

A demonstration is available at page

<http://dewey.intrallect.com/products/intralibrary/demo.htm>.

TOPIC

TOPIC NAME

COURSEWARE REPOSITORY

TOPIC TYPE

DIGITAL REPOSITORY

DESCRIPTION

The Courseware Repository is an 'Open Library' where it is possible to publish courses.

The courses can be used stand-alone or integrated with an ADL/SCORM conforming Learning Management Systems.

Occurrence – web resource

http://www.vusononline.com/elearning-appliance-interface/Content_Repository/Index.html

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TOPIC
TOPIC NAME E_LEARNING REPOSITORY
TOPIC TYPE DIGITAL REPOSITORY
DESCRIPTION
E-learning repository is a tool for the storage and retrieval of learning objects. It includes tools for meta-data tagging and taxonomy browsing. Courses are stored with IMS / IEEE LOM meta-data. The repository is designed to use learning objects that adhere to the international specifications from IMS and SCORM.
Occurrence – web resource http://www.teknical.com/products/elearning_repository.htm

TOPIC
TOPIC NAME COL Learning Object Repository
TOPIC TYPE DIGITAL REPOSITORY
DESCRIPTION
It is an Open Source Learning Object Repository. It includes learning objects which are IMS-compatible (IMS Schema 1.2.2).
Occurrence – web resource http://www.col.org/lor/

TOPIC
TOPIC NAME Iconex Project

TOPIC TYPE

DIGITAL REPOSITORY

DESCRIPTION

The ICONEX project is investigating interoperability and re-use of learning objects specifically through learning management systems. They are working with a learning management system called xtensor which has an IMS compliant repository. The repository manages the resource and holds IMS Metadata in a database.

Occurrence – web resource

<http://www.iconex.hull.ac.uk/>

TOPIC

TOPIC NAME

SeSDL

TOPIC TYPE

DIGITAL REPOSITORY

DESCRIPTION

SeSDL (Scottish Electronic Staff Development Library) is a repository of learning objects allowing to upload content, tag it with IMS Metadata and then download it in an IMS content package.

Occurrence – web resource

<http://www.sesdl.scotcit.ac.uk/>

TOPIC

TOPIC NAME

Ariadne KPS

TOPIC TYPE

DIGITAL REPOSITORY

DESCRIPTION

Ariadne KPS (Knowledge Pool System) contains metadata instances for learning objects. It is a distributed repository for learning objects; it encourages the share and reuse of such objects.

I.9 ASSOCIATION TYPES

TOPIC

TOPIC NAME

IS STANDARD COMPONENT OF

TOPIC TYPE

ASSOCIATION TYPE

DESCRIPTION

This shows that a certain topic (in fact a standard component) IS STANDARD COMPONENT of another topic (in fact a standard).

TOPIC

TOPIC NAME

DELIVERS

TOPIC TYPE

ASSOCIATION TYPE

DESCRIPTION

This shows that a certain topic (in fact a standardization organization) delivers the standard specifications for a standard.

TOPIC

TOPIC NAME

PUBLISHES

TOPIC TYPE

ASSOCIATION TYPE

DESCRIPTION

This shows that a certain topic (in fact an authoring tool) publishes items in the right format for a standard topic.

TOPIC

TOPIC NAME

SUPPORTS

TOPIC TYPE

ASSOCIATION TYPE

DESCRIPTION

This shows that a certain topic (in fact a learning management system) supports a standard.

TOPIC

TOPIC NAME

CAN CONTAIN

TOPIC TYPE

ASSOCIATION TYPE

DESCRIPTION

This shows that a certain topic (in fact a digital repository) can contain resources specified in the format of a standard topic.

TOPIC

TOPIC NAME

IS PART OF

TOPIC TYPE

ASSOCIATION TYPE

DESCRIPTION

This shows that a certain topic (in fact a standard component) is part of the set of elements of a given other standard component topic.

III ASSOCIATIONS

In this section we define the associations to be included into the topic map web application. According to the design process explained in the introduction, in Sec II we defined a topic type, *association type*, and a set of topics of that type (*is standard component of, delivers, publishes, supports, can contain and is part of*): each association we define here is of one of those types so we group them accordingly, from Sec. III.1 through Sec. III.6 (the templates used to define each association are explained in the introduction).

I.1 ASSOCIATIONS (IS STANDARD COMPONENT OF) (17)

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM CAM

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

SCORM consists of three main components: Content Aggregation Model (CAM), Runtime Environment (RTE), Sequencing and Navigation (SN).

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM CAM METADATA

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

The Content Aggregation Model (CAM) is a component of the SCORM standard; it consists of four (sub-)components: Content Model, Content Packaging ,Meta-data, Sequencing and Navigation

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM CAM CONTENT MODEL

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

The Content Aggregation Model (CAM) is a component of the SCORM standard; it consists of four (sub-)components: Content Model, Content Packaging ,Meta-data, Sequencing and Navigation

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM CAM CONTENT PACKAGING

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

The Content Aggregation Model (CAM) is a component of the SCORM standard; it consists of four (sub-)components: Content Model, Content Packaging ,Meta-data, Sequencing and Navigation

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM RTE

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

SCORM Run-time Environment - SCORM consists of three main components: Content Aggregation Model (CAM), Run-time Environment (RTE), Sequencing and Navigation (SN).

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM CAM LAUNCH

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

Launch: The mechanism for defining a common way for LMSs to start Web-based learning resources. It defines the procedures and responsibilities for establishing the communication between the delivered learning resources and the LMS

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM RTE APPLICATION PROGRAMMING INTERFACE

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

Application Programming Interface: provides a communication mechanism that allows the SCO to communicate with the LMS. It is assumed that once the SCO is launched it can then exchange information with an LMS. Any communication between the LMS and the SCO is initiated by the SCO. There is currently no mechanism supporting the LMSs in initiating calls to functions implemented by a SCO.

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM RTE DATA MODEL

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

Data Model: A standard set of data elements used to define the information being communicated, such as the status of the learning resource. In its simplest form, the data model defines the elements that both the LMS and SCO are expected to “know” about. The LMS must maintain the state of required data elements across sessions. The purpose of establishing a common data model is to ensure that a defined set of information about SCOs can be tracked by different LMS environments.

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

SCORM SN

Member role

is component of

Member

SCORM

Member role

is composed by

COMMENTS

SCORM Sequencing and Navigation - SCORM consists of three main components: Content Aggregation Model (CAM), Run-time Environment (RTE), Sequencing and Navigation (SN).

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

IMS METADATA

Member role

is component of

Member

IMS

Member role

is composed by

COMMENTS

The IMS standard consists of the following subparts.

- Meta-data: the core elements to be used for describing Learning material;
- Content Packaging: description of the aggregation structure of learning resources into courses or parts of courses;
- Question & Test Interoperability; Learning Design; Simple Sequencing

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

IMS CONTENT PACKAGING

Member role

is component of

Member

IMS

Member role

is composed by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

IMS QTI

Member role

is component of

Member

IMS

Member role

is composed by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

IMS LD

Member role

is component of

Member

IMS

Member role

is composed by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

IMS SIMPLE SEQUENCING

Member role

is component of

Member

IMS

Member role

is composed by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

IEEE LOM METADATA

Member role

is component of

Member

IEEE LOM

Member role

is composed by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

DUBLIN CORE METADATA

Member role

is component of

Member

DUBLIN CORE

Member role

is composed by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS STANDARD COMPONENT OF

Member

ARIADNE METADATA

Member role

is component of

Member

ARIADNE

Member role

is composed by

COMMENTS

-

I.2 ASSOCIATIONS (IS PART OF) (7)

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM CAM CONTENT MODEL

Member role

is part of

Member

SCORM CAM

Member role

contains

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM CAM CONTENT PACKAGING

Member role

is part of

Member

SCORM CAM

Member role

contains

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM CAM METADATA

Member role

is part of

Member

SCORM CAM

Member role

contains

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM CAM SEQUENCING AND NAVIGATION

Member role

is part of

Member

SCORM CAM

Member role

contains

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM RTE LAUNCH

Member role

is part of

Member

SCORM RTE

Member role

contains

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM RTE APPLICATION PROGRAMMING INTERFACE

Member role

is part of

Member

SCORM RTE

Member role

contains

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

IS PART OF

Member

SCORM RTE DATA MODEL

Member role

is part of

Member

SCORM RTE

Member role

contains

COMMENTS

-

I.3 ASSOCIATIONS (PUBLISHES) (51 S17 I9 DC12 IE3 LRN2 A1 AI7)

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

AltEd Global Project

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Design a Course Author

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

E-learning Consulting SCORM Tools

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Exe 0.6 release

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Exe 0.6 release

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

E-learning authoring tool

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Lersus easyContent

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Lersus easyContent

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Macromedia Authorware 7.0

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Metadata Generator Pro

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

SCORM 1.2 Player

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

SCORM 1.2 Resource Kit

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Visual Course Builder

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Alfanet QTI Tools

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Elicitus Content Publisher

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Elicitus Content Publisher

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Elicitus Content Publisher

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

IMS Assesst Designer

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

wizBuilder

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

wizBuilder

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Komposer

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

IMSEVIMSE: the IMS editor VIMSE

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

RapidExam™ v2.5 Deluxe

Member role

Publishes for

Member

IMS

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

LOM-Editor

Member role

Publishes for

Member

IEEE LOM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

TreeLom

Member role

Publishes for

Member

IEEE LOM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Automatic Metadata Generation Framework

Member role

Publishes for

Member

IEEE LOM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Automatic Metadata Generation Framework

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Automatic Metadata Generation Framework

Member role

Publishes for

Member

ARIADNE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

DC-assist

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

DC-dot

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Dublin Core Metadata Template

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

EUC metadata tool

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Metadata Generator

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Meta Tag Editor

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Mozilla Firefox Dublin Core Viewer Extension

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

MyMetaMaker

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Reggie - The Metadata Editor

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

TagGen Office - Dublin Core Editor

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

The EULER Dublin Core Metadata Template

Member role

Publishes for

Member

DUBLIN CORE

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Istruendo Kit Authoring

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Course Authoring Tool

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Course Authoring Tool

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Authoring Pro

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Authoring Pro

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Authoring Pro

Member role

Publishes for

Member

LRN

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

AICC File Editor

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Lectora

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Lectora

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

Lectora

Member role

Publishes for

Member

LRN

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

SyberWorks Web Author

Member role

Publishes for

Member

SCORM

Member role

Can be published by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

PUBLISHES

Member

SyberWorks Web Author

Member role

Publishes for

Member

AICC

Member role

Can be published by

COMMENTS

-

I.4 ASSOCIATIONS (SUPPORTS) (30 – S20 I6 A4)

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

BLACKBOARD

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

CONTENTO LMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

DLMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

DLMS

Member role

supports

Member

IMS

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

DLMS

Member role

supports

Member

AICC

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

DOCEBOLMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

DOKEOS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

A.M.I.C.A.

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

E-LEARNING CONSULTING LMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

Inquisiq EX

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

ILIAS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

ILIAS

Member role

supports

Member

AICC

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

LearnerWeb

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

LearnerWeb

Member role

supports

Member

AICC

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

Learning Space

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

Learning Space

Member role

supports

Member

IMS

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

MOODLE

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

TrainCaster LMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

TinyLMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

WEBCT

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

TopClass E-learning Suite

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

ATUTOR

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

ATUTOR

Member role

supports

Member

IMS

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

CLAROLINE

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

CLAROLINE

Member role

supports

Member

IMS

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

OPENLMS

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

OPENLMS

Member role

supports

Member

IMS

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

University360 Learning Management System

Member role

supports

Member

SCORM

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

University360 Learning Management System

Member role

supports

Member

AICC

Member role

is supported by

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

SUPPORTS

Member

WBT MANAGER

Member role

supports

Member

AICC

Member role

is supported by

COMMENTS

-

I.5 ASSOCIATIONS (CAN CONTAIN) (8 A1 S3 I4)

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

INTRALIBRARY

Member role

can contain

Member

SCORM

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

COURSEWARE REPOSITORY

Member role

can contain

Member

SCORM

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

E_LEARNING REPOSITORY

Member role

can contain

Member

SCORM

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

E_LEARNING REPOSITORY

Member role

can contain

Member

IMS

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

COL Learning Object Repository

Member role

can contain

Member

IMS

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

Iconex Project

Member role

can contain

Member

IMS

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

SeSDL

Member role

can contain

Member

IMS

Member role

(learning objects) can be contained in

COMMENTS

-

ASSOCIATION

ASSOCIATION TYPE

CAN CONTAIN

Member

Ariadne KPS

Member role

can contain

Member

ARIADNE

Member role

(learning objects) can be contained in

COMMENTS

-

I.6 ASSOCIATIONS (DELIVERS)

References

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