



IMS Learning Resource Meta-data Information Model

**Final Specification
Version 1.1**

About This Document

Title	IMS Learning Resource Meta-data Information Model
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Summary	This document provides updated information regarding IMS Learning Resource Meta-data Information Model.
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Revision History

Version No.	Release Date	Comments
Final 1.0	August 20, 1999	The version 1.0 of the IMS Learning Resource Meta-data Information Model Released.
Final 1.1	May 5, 2000	IEEE LTSC LOM Version 3.5 Tables included. All element names changed to lower case only

This document describes the names, definitions, organization, and constraints of the IMS meta-data elements. This work is composed of two parts, a working document from an IEEE standards committee, of which IMS member organizations have been key contributors, and a number of modifications that have been approved by the IMS Technical Board.

The IEEE document is the Version 3.5 Learning Object Meta-data Scheme working document of the IEEE Learning Technology Standards Committee's Learning Object Meta-data Working Group. Many organizations around the world have collaborated on this document, including substantial involvement by IMS member organizations either directly or through IMS Briefing and Feedback meetings. The document lists the meta-data elements and how they are organized hierarchically. Each element is described with 5 pieces of information:

- Name: How the meta-data element should be spelled
- Explanation: The definition of the element.
- Multiplicity: How many elements are allowed and whether their order is significant.
- Type: Whether the element's value is textual, numerical or a date; and any constraints on its size and format.
- Rationale: Why the element was included. Guidelines for its use, etc.

It is expected that incorporation of this information into a complete IEEE specification and formal balloting of the specification will occur sometime in the year 2000.

The second part of this document contains a number of modifications approved unanimously by the IMS Technical Board. These changes were recommended based on implementation testing and detailed document reviews. The IMS Technical Board representatives include many individuals who have actively participated in the development of the IEEE document. Those individuals judged the likelihood of these changes being incorporated into the IEEE document as high.

Any future IMS certification/conformance testing will be based on the combination of these two resources.

IEEE Document

- Version 3.5 LOM Scheme posted July 15, 1999 (included below for reference). <http://ltsc.ieee.org/doc/wg12/scheme.html>
- Version 3.5 LOM Scheme notes posted July 15, 1999 http://ltsc.ieee.org/doc/wg12/release_notes.html

IMS additions and modifications are noted in the Modifications section following the IEEE LTSC LOM V3.5 tables.

IEEE Learning Technology Standards Committee Learning Object Meta-data Version 3.5: Base Scheme (1999-07-15)

Names have been changed to be all lower case.

Nr	Name	Explanation	Multiplicity	Domain	Type	Note	Example
BaseScheme							
1	general	Context - independent features of the resource.	single instance	-	-	-	-
1.1	identifier	A unique label for the resource.	single value	-	Reserved	<p>1. This element can be transparent to the meta-data creator. It can be created by the meta-data management system.</p> <p>2. This element corresponds with the Dublin Core element DC.Identifier.</p>	-
1.2	title	Name given to the resource.	single value	-	LangStringType (1024 char)	<p>1. The title can be an already existing one or it may be created by the indexer ad hoc.</p> <p>2. Corresponds with Dublin Core element DC.Title.</p>	-
1.3	catalogentry	Designation given to the resource.	unordered list (8 items)	-	-	<p>1. This element may be used as a functional replacement for the currently reserved</p>	-

						<p>element <i>Identifier</i> (1.1).</p> <p>2. One of the catalog entries can be generated automatically by the tool.</p>	
1.3.1	catalogue	Indication of the source of the following string value.	single value	-	String (1024 char)	Generally the name of the catalogue.	ISBN, ARIADNE
1.3.2	entry	Actual string value.	single value	-	String (1024 char)	Generally the number in the catalogue named in <i>Catalogue</i> (1.3.1).	2-7342-0318, LEAO875
1.4	language	The human language used by the typical intended user of the resource.	unordered list (8 items)	LanguageID = Langcode('-Subcode)*, with Langcode a two-letter language code as defined by ISO639 and Subcode a country code from ISO3166.	String (128 char)	<p>1. The approach adopted is compatible with that of the xml:lang attribute and is defined by RFC1766.</p> <p>2. ISO639 deals with 'ancient' languages, like Greek and Latin.</p> <p>3. Tool should provide useful default.</p> <p>4. It is customary to give the language code in lower case and the country code (if any) in upper case. However, the values are case insensitive.</p> <p>5. This element corresponds with the</p>	"en", "en-GB", "de", "fr-CA", "it"

						Dublin Core element DC.Language.	
1.5	description	A textual description of the content of the resource.	unordered list (8 items)	-	LangStringType (2048 char)	This element corresponds to the Dublin Core element DC.Description.	-
1.6	keywords	Keywords describing the resource.	unordered list (8 items)	-	LangStringType (1024 char)	It is <i>strongly</i> recommended not to use this element for characteristics that can be described by other elements.	-
1.7	coverage	The spatial or temporal characteristics of the intellectual content of the resource.	unordered list (8 items)	-	LangStringType (1024 char)	This element corresponds with the Dublin Core element DC.Coverage.	-
1.8	structure	Underlying organizational structure of the resource.	single value	restricted vocabulary: {Collection, Mixed, Linear, Hierarchical, Networked, Branched, Parceled, Atomic}	String (32 char)	-	-
1.9	aggregation level	The functional size of the resource.	single value	0..3	String (8 char)	Level 0 means smallest level of aggregation, e.g. raw media data or fragments. Level 1 refers to a collection of atoms, e.g. an HTML document with some embedded pictures or a lesson. Level 2 indicates a	-

						collection of level 1 resources, e.g. a 'web' of HTML documents, with an index page that links the pages together or a unit. Finally, level 3 refers to the largest level of granularity, e.g. a course.	
2	lifecycle	Features related to the life cycle of the resource.	single instance	-	-	-	-
2.1	version	The edition of the resource.	single value	-	LangStringType (64 char)	-	3.0, 1.2.alpha, voorlopige versie
2.2	status	The condition the resource is in.	single value	restricted vocabulary: {Draft, Final, Revised, Unavailable}	String (64 char)	-	-
2.3	contribute	Persons or organisations contributing to the resource (includes creation, edits and publication).	unordered list (32 items)	-	-	-	-
2.3.1	role	Kind of contribution.	single value	best practice list: { Author, Publisher, Unknown, Initiator, Terminator, Validator, Editor, Graphical Designer, Technical Implementer, Content Provider, Technical Validator, Educational	LangStringType (128 char)	It is recommended that exactly one instance of Author exists.	-

				Validator, Script Writer, Instructional Designer}			
2.3.2	entity	Entity or entities involved, most relevant first.	ordered list (8 items)	vCard <http://www.imc.org/pdi/>	String (1024 chars)	<p>1. If <i>Role</i> (2.3.1) is Author, then the entity is typically a person and this element corresponds with the Dublin Core element DC.Creator.</p> <p>2. If <i>Role</i> equals Publisher, then the entity is typically an organisation and this element corresponds with the Dublin Core element DC.Publisher.</p> <p>3. If <i>Role</i> is not equal to Author or Publisher, then this element corresponds with the Dublin Core element DC.Contributor.</p> <p>4. If the entity is an organisation, then it is typically a university department, company, agency, institute, etc. under whose responsibility the contribution was made.</p>	-
2.3.3	date	The date of the contribution.	single value	-	DateType	-	-
3	metametadata	Features of the description rather than the resource.	single instance	-	-	-	-

3.1	identifier	A unique label for the meta-data.	single value	-	Reserved	This element can be transparent to the meta-data creator. It can be created by the meta-data management system.	-
3.2	catalogentry	Designation given to the meta-data instance.	unordered list (8 items)	-	-	1. This element may be used as a functional replacement for the currently reserved element <i>Identifier</i> (3.1). 2. One of the catalog entries can be generated automatically by the tool.	-
3.2.1	catalogue	Indication of the source of the following string value.	single value	-	String (1024 char)	Generally system generated.	Ariadne
3.2.2	entry	Actual string value.	single value	-	String (1024 char)	Generally system generated.	KUL532
3.3	contribute	Persons or organisations contributing to the meta-data.	ordered list (8 items)	-	-	-	-
3.3.1	role	Kind of contribution.	single value	open vocabulary with best practice list: {Creator, Validator}	LangStringType (128 char)	It is recommended that exactly one instance of creator exists.	-
3.3.2	entity	Entity or entities involved, most relevant first.	ordered list (8 items)	vCard < http://www.imc.org/pdi/ >	String (1024 char)	-	-

3.3.3	date	The date of the contribution.	single value	-	DateType	-	-
3.4	metadatascheme	Names the structure of the meta-data (this includes version).	unordered list (8 items)	-	String (32 char)	1. Generally user selectable or system generated. 2. If multiple values are provided, then the meta-data instance conforms to multiple meta-data schemes.	LOM-1.0
3.5	language	Language of the meta-data instance. This is the default language for all LangString values.	single value	see LangStringType.Language	String (128 char)	-	-
4	technical	Technical features of the resource.	single instance	-	-	-	-
4.1	format	Technical data type of the resource.	unordered list (8 item)	restricted vocabulary: MIME type or 'non-digital'	String (512 char)	1. Can be used to identify the software needed to access the resource. 2. This element corresponds with the Dublin Core element DC.Format.	video/ mpeg, application/ x-toolbook, text/html
4.2	size	The size of the digital resource in bytes. Only the digits '0'..'9' should be used;	single value	-	String (32 char)	This refers to the actual size of the resource, and not to the size of a compressed version of the resource.	-

		the unit is bytes, not MBytes, GB, etc.					
4.3	location	A location or a method that resolves to a location of the resource. Preferable Location first.	ordered list (8 items)	-	String (1024 char)	-	http://host/id
4.4	requirements	Needs in order to access the resource. If there are multiple requirements, then the logical connector is AND.	unordered list (8 items)	-	-	-	-
4.4.1	type	Type of requirement.	single value	open vocabulary with best practice: {Operating System, Browser}	LangStringType (32 char)	-	-
4.4.2	name	Name of the required item.	single value	if Type='Operating System', then best practice list: {PC-DOS, MS-Windows, MacOS, Unix, Multi-OS, Other, None} if Type='Browser' then best practice list: {Any, Netscape Communicator, Microsoft Internet Explorer, Opera} if other type then open vocabulary	LangStringType (1024 char)	May be derived from <i>Format</i> (4.1) automatically, e.g., HTML implies "Multi-OS"	-
4.4.3	minimumversion	Lowest version of the required	single value	-	String (32 char)	-	-

		item.					
4.4.4	maximumversion	Highest version of the required item.	single value	-	String (32 char)	-	-
4.5	installationremarks	Description on how to install the resource.	single value	-	LangStringType (1024 char)	-	-
4.6	other platform requirements	Information about other software and hardware requirements.	single value	-	LangStringType (1024 char)	-	sound card ..., runtime ...
4.7	duration	Time a continuous resource takes when played at intended speed, in seconds.	single value	-	DateType	This is especially useful for sounds, movies or animations.	PT1H30M, PT1M45S
5	educational	Educational or pedagogic features of the resource.	single instance	-	-	-	-
5.1	interactivity type	The type of interactivity supported by the resource.	single value	restricted vocabulary: {Active, Expositive, Mixed, Undefined}	String (12 char)	In an <i>expositive</i> resource, the information flows mainly from the resource to the learner. Expositive documents are typically used for learning- by- reading. In an <i>active</i> resource, information also flows from the learner to the resource. Active	Expositive documents include essays, video clips, all kinds of graphical material and hypertext documents. Active documents include

						documents are typically used for learning- by- doing. <i>note:</i> Activating links to navigate in hypertext documents is not considered as an information flow. Thus, hypertext documents are expositive.	simulations, questionnaires and exercises.
5.2	learning resource type	Specific kind of resource, most dominant kind first.	ordered list (8 items)	open vocabulary with best practice {Exercise, Simulation, Questionnaire, Diagram, Figure, Graph, Index, Slide, Table, Narrative Text, Exam, Experiment, ProblemStatement, SelfAssesment}	LangStringType (1024 char)	This element corresponds with the Dublin Core element 'Resource Type'. The vocabulary is adapted for the specific purpose of <i>learning</i> objects.	-
5.3	interactivitylevel	Level of interactivity between an end user and the resource.	single value	{0, 1, 2, 3, 4}	String (8 char)	0 means "Very Low", 1 means "Low", 2 means "Medium", 3 means "High", and 4 means "Very High".	-
5.4	semanticdensity	Subjective measure of the resource's usefulness as compared to its size or duration.	single value	{0, 1, 2, 3, 4}	String (8 char)	0 means "Very Low", 1 means "Low", 2 means "Medium", 3 means "High", and 4 means "Very High".	-
5.5	intended end user role	Normal user of the resource, most dominant first.	ordered list (4 items)	restricted vocabulary: {Teacher, Author, Learner, Manager}	String (32 char)	A learner works with a resource in order to learn something. An author creates or	-

						publishes a resource. A manager manages the delivery of the resource, e.g., a university or college. The document for a manager is typically a curriculum.	
5.6	learning context	The typical kind of learners.	unordered list (8 items)	Open vocabulary with best practice: {Primary Education, Secondary Education, Higher Education, University First Cycle, University Second Cycle, University Postgrade, Technical School First Cycle, Technical School Second Cycle, Professional Formation, Continuous Formation, Vocational Training, Other}	LangStringType (128 chars)	-	-
5.7	typical age range	Age of the typical intended user.	unordered list (4 items)	-	LangStringType (1024 chars)	-	suitable for children over 7, adults only
5.8	difficulty	How hard it is to work through the resource for the typical target audience.	single value	{0, 1, 2, 3, 4}	String (8 char)	0 means "Very Easy", 1 means "Easy", 2 means "Medium", 3 means "Difficult", and 4 means "Very Difficult".	-
5.9	typical learning time	Approximate or typical time it takes to work with the resource.	single value	-	DateType	-	PT1H30M, PT1M45S

5.10	description	Comments on how the resource is to be used.	single value	-	LangStringType (1024 char)	-	Teacher guidelines that come with a textbook.
6	rights	Conditions of use of the resource.	single instance	-	-	Intent is to reuse results of ongoing work in the Intellectual Property Right and e-commerce communities. This category currently provides the absolute minimum level of detail only.	-
6.1	cost	Whether use of the resource requires payment.	single value	restricted vocabulary: {yes, no}	String (8 char)	-	-
6.2	copyright and other restrictions	Whether copyright or other restrictions apply to the use of the resource.	single instance	restricted vocabulary: {yes, no}	String (8 char)	-	-
6.3	description	Comments on the conditions of use of the resource.	single value	-	LangStringType (1024 char)	-	-
7	relation	Features of the resource in relationship to other resources.	unordered list (32 items)	-	-	-	-
7.1	kind	Nature of the relationship between the resource being	single value	best practice list from Dublin Core: {IsPartOf, HasPart, IsVersionOf, HasVersion, IsFormatOf, HasFormat.	LangStringType (1024 char)	This element corresponds with the Dublin Core element DC.Relation.	-

		described and the one identified by <i>Resource</i> (7.2).		References, IsReferencedBy, IsBasedOn, IsBasisFor, Requires, IsRequiredBy}			
7.2	resource	Resource the relationship holds for.	single instance	-	-	-	-
7.2.1	identifier	Unique Identifier of the other resource.	single value	-	Reserved	-	-
7.2.2	description	Description of the other resource.	single value	-	LangStringType (1024 char)	-	-
8	annotation	Comments on the educational use of the resource.	unordered list (32 items)	-	-	-	-
8.1	person	Annotator.	single value	vCard < http://www.imc.org/pdi/ >	String (1024 char)	-	-
8.2	date	Date that the annotation was created.	single value	-	DateType	-	-
8.3	description	The content of the annotation.	single value	-	LangStringType (1024 char)	-	-
9	classification	Description of a characteristic of the resource by entries in classifications.	unordered list (10 items)	-	-	1. End users can refer to their preferred classifications. 2. If <i>Purpose</i> (9.1) equals Discipline, then this category corresponds with the Dublin Core element DC.Subject.	-

9.1	purpose	Characteristics of the resource described by this classification entry.	single value	open vocabulary with best practice: {Discipline, Idea, Prerequisite, Educational Objective, Accessibility Restrictions, Educational Level, Skill Level, Security Level}	LangStringType (128 char)	-	-
9.2	taxonpath	A taxonomic path in a specific classification. There may be different paths, in the same or different classifications, that describe the same characteristic.	unordered list (16 items)	-	-	-	-
9.2.1	source	A specific classification.	single value	-	String (1024 char)	Any recognized "official" taxonomy, any user-defined taxonomy. A tool may provide the top-level entries of a well-established classification (LOC, UDC, DDC, etc.).	ACM, MESH, ARIADNE
9.2.2	taxon	An entry in a classification. An ordered list of Taxons creates a taxonomic path, i.e. "taxonomic stairway": this is a path from a more general to	ordered list (16 items)	-	LangStringType (512 char)	A TaxonPath can have a depth from 1 to 9. Normal values are between 2 and 4.	Physics/ Acoustics/ Instruments/ Stethoscope Medicine/ Diagnostics/ Instruments/ Stethoscope

		more specific entry in a classification.					
9.3	description	A textual description of the characteristic being described.	single value	-	LangStringType (2048 char)	-	-
9.4	keywords	Keywords describing the characteristic, most relevant first.	ordered list (8 items)	-	LangStringType (1024 char)	-	-

Nr	Name	Explanation	Multiplicity	Domain	Type	Note	Example
LangStringType							
1	langstring	String in one or more human languages.	unordered list (8 items)	-	-	-	-
1.1	language	Human language in which the string is expressed.	single value	LanguageID = Langcode('-Subcode)*, with Langcode a two-letter language code as defined by ISO639 and Subcode a country code from ISO3166.	String (128 char)	<ol style="list-style-type: none"> 1. The approach adopted is compatible with that of the xml:lang attribute and is defined by RFC1766. 2. ISO639 deals with 'ancient' languages, like Greek and Latin. 3. Tool should provide useful default. 4. It is customary to give the language code in lower case and the country code (if any) in upper case. However, the values are case insensitive. 5. If no Language is specified, then LangString. String should be 	"en", "en-GB", "de", "fr-CA", "it"

						interpreted as a string in MetaMetaData. Language.	
1.2	string	Actual string value.	single value	-	String	-	-

Nr	Name	Explanation	Multiplicity	Domain	Type	Note	Example
DateType							
1	datetime	Date expressed as per ISO8601 standard.	single value	ISO8601	String (256 char)	All occurrences of this type correspond with the Dublin Core element DC.Date.	1999-06-11
2	description	Description of the date.	single value	-	LangStringType (8 items, 1024 char)	-	circa 1300 BC, Fall Semester 1999

IMS Modifications

The changes, with some rationale, are provided below with the specific changes to the IEEE document in wording shown in *italics text*:

Nr	Name	Explanation	Multiplicity	Type	Rationale
1.1	identifier	A unique label for the resource.		Reserved	<p>1. This element can be transparent to the meta-data creator. It can be created by the meta-data management system.</p> <p>2. This element corresponds with the Dublin Core element DC.Identifier.</p> <p>3. This is a reserved element that cannot be used</p> <p>(The IMS added this 3rd item to reinforce that the Identifier element is not to be used)</p>
1.3.2	entry	Actual string value.	Single value	<i>LangStringType</i> (1024 char)	The IMS felt that all of the Entry elements should have the ability to express their value in multiple languages. See elements 3.2.2 and 9.2.2.2 also
1.4	language	<i>The human language of the resource.</i>	unordered list (8 items)	String (128 char)	It was felt that the old definition was not appropriate for the General category. A new Language element is suggested, with the same definition that element 1.4 had previously, in the Educational category where it seems to fit better.
1.8	structure	Underlying organizational structure of the resource.	single value	<i>LangStringType</i> (32 char)	<p>It was felt that any element using a restricted vocabulary item as its value should have the ability to express that value in different languages. This was applied to all elements with restricted vocabularies including elements</p> <p>1.8 Structure</p> <p>2.2 Status</p> <p>4.1 Format</p>

					5.1 InteractivityType 5.5 IntendedEndUserRole
2.2	status	The condition the resource is in.	single value	<i>LangStringType</i> (64 char)	See rationale for element 1.8 above
3.2.2	entry	Actual string value.	Single value	<i>LangStringType</i> (1024 char)	See rationale for 1.3.2 above
4.1	format	Technical data type of the resource.	unordered list (8 item)	<i>LangStringType</i> (512 char)	See rationale for element 1.8 above
5.1	interactivitytype	The type of interactivity supported by the resource.	single value	<i>LangStringType</i> (32 char)	See rationale for element 1.8 above It is also suggested that min/max value for this element be increased from 12 chars to 32 chars to account for it being represented in different languages.
5.5	intendedenduserrole	Normal user of the resource, most dominant first.	ordered list (4 items)	LangStringType (32 char)	See rationale for element 1.8 above
<i>5.11</i>	<i>language</i>	<i>The human language used by the typical intended user of the resource.</i>	<i>unordered list (8 items)</i>	<i>String (128 char)</i>	This is a completely new element for the Educational category, but it is really just the old element 1.4 Language moved to this category.
<i>9.2.2.1</i>	<i>id</i>	<i>The identifier of the Taxon</i>	<i>Single value</i>	<i>String (128 char)</i>	It seems there are a few taxonomies (such as the Dewey system) that make use of both an identifier (such as a number of letter) and a label. An example is using the Dewey system, the Entry "Social Sciences" has the associated number or ID of "300". We tried using other mechanisms such as attributes, but this was not satisfactory. We suggest adding ID and Entry to the Taxon element.
<i>9.2.2.2</i>	<i>entry</i>	<i>The textual label of the Taxon.</i>	<i>Single value</i>	<i>LangStringType</i> (512 char)	See the rationale for ID and Entry 1.3.2 above.

