

LiLa – Library of Labs

**Meta Data Definition:
LiLa AP (Application Profile)**

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¹ OJ L 79, 24.3.2005, p. 1.



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1 The LiLa AP – aims and scope

Library of Labs (LiLa) is a project of eight European universities and three enterprises co-funded by the EU programme **eContentplus**. Basically, LiLa will be a portal that integrates remote and virtual laboratories and experiments. Furthermore, LiLa will provide additional services such as a connection to library resources, a scheduling system, a tutoring system, and a 3D-environment for online collaboration. The focus lies on higher education teaching in the area of science and technology. Metadata for describing the individual laboratory resources contributed by the project partners is an important aspect within the LiLa portal since it makes resources searchable and retrievable and it enables the integration of library catalogues and repositories as well as an exchange with other portals. Last but not least, the metadata can also be used for internal administration. Therefore, this LiLa Dublin Core Application Profile (LiLa AP) was developed to provide a core set of metadata elements for describing online experiments (remote and virtual) and related other contents, such as e-learning courses, manuals/descriptions, videos etc.

This report, the LiLa AP, documents the metadata used in order to provide the users of this application profile with a manual and to enable interoperability with other applications. For the purpose of interoperability, we based this LiLa AP documentation on the Singapore Framework for Dublin Core Application Profiles². An overview of the elements of the Singapore Framework is given in Fig. 1.

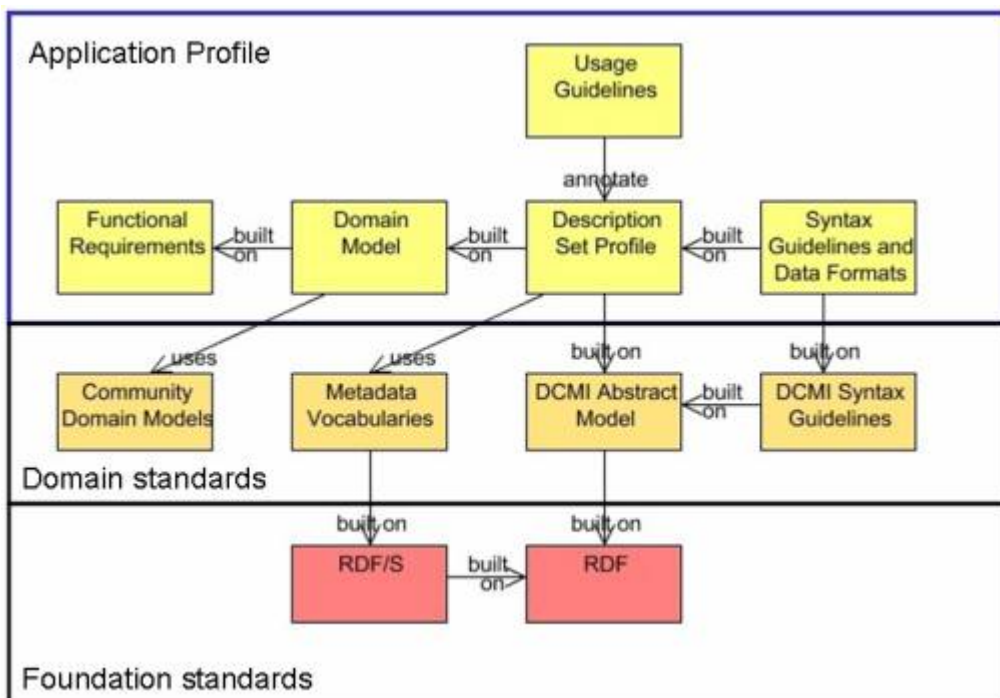


Fig. 1: Singapore Framework for Dublin Core Application Profiles, source: <http://dublincore.org/documents/singapore-framework/>

² <http://dublincore.org/documents/singapore-framework/>



The structure of this documentation will correspond to the Singapore Framework structure as shown in Fig. 1: we will start with the functional requirements in chapter 2, present the domain model in chapter 3, and finish with the description set profiles as well as syntax guidelines and data formats in chapters 4 (overview) and 5 (detail).

The users of the LiLa AP are

- providers of resources who fill in the metadata
- LiLa administrators who manage the resources
- LiLa developers who implement the application profile
- mediators who want to use the resources for teaching purposes
- library catalogue or repository administrators who integrate LiLa metadata
- administrators of existing portals who want to integrate LiLa metadata
- developers of new portals who want to use the LiLa AP for their metadata

By means of this LiLa AP, these users are provided with a detailed manual for the metadata (fields).

Several persons and institutions were involved in the development process of this application profile. The authors of this documentation are Irene Schumm, Claus Spiecker and Matthias Schulze from the Universitätsbibliothek Stuttgart. The authors are indebted to many persons who provided useful hints, comments, and discussions and contributed in this way to the development of the LiLa AP. Without being exhaustive, we want to mention Stefanie Rühle from the KIM³ and our LiLa project partners who added their share to the work: David Boehringer, Aaron Coble, Thieme Hennis, Spiros Kassavetis, Lars Knipping, Nicole Natho, Thomas Richter, Tilmann Robbe, Harald Scheel, Yvonne Tetour, Wim Veen, Roger Watson.

The LiLa AP will be made available on the website of the Universitätsbibliothek Stuttgart (University Stuttgart, University Library) and on the LiLa website (<http://www.lila-project.org>). Further developments, enhancements, or updates will be provided by the LiLa Consortium.

2 The LiLa AP – functional requirements

There are several general functions that should be supported by the metadata based on the LiLa AP. The functions are:

- search and browse for contributors, mediators, names and types of resources, subjects, key words, education levels, languages, and instructional methods
- find the wanted resources and assess them
- identify, select, and retrieve the wanted resources
- ensure interoperability with other applications
- support internal administration of the resources
- enable mediators such as professors, teaching assistants etc. to combine and use the resources for teaching purposes

³ Kompetenzzentrum Interoperable Metadaten: <http://www.kim-forum.org/>

3 The LiLa AP – domain model

Figure 2 shows a Entity Relationship Diagram of the entities that are described in the LiLa AP by description set profiles.

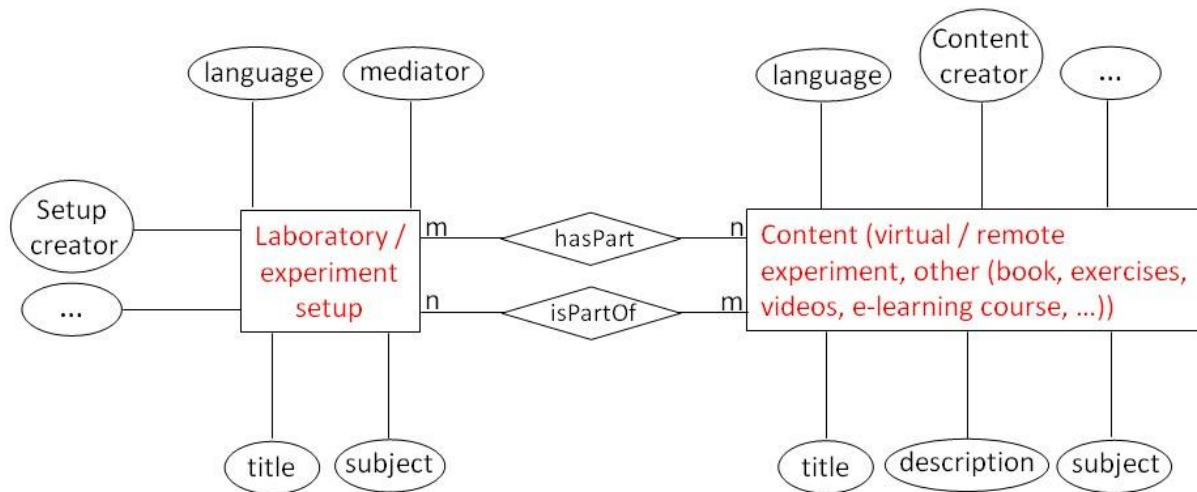


Fig. 2: Entity Relationship Diagram of the LiLa entities, their relations and attributes.

The hierarchy in the data model is as follows: a laboratory/experiment setup is created by collecting different contents of LiLa that might be pedagogically useful in a given context. The contents are mainly multimedia objects, like applets of virtual/remote experiments, e-learning courses/tutorials, videos, online manuals etc. and a content object and can be used for different laboratory/experiment setups.

Consequently, there are two description set profiles: one for a laboratory/experiment setup (left box) and one for the individual contents (right box).

In the following, we describe the roles of several persons, who are deposited as properties of the entities. On content level, there are/can be

- the content creator: person, who made the described virtual/remote experiment (applet/simulation) or other contents (lecture notes, exercises, videos, e-learning courses/tutorials etc.)
- the publisher: person who made the described content available online; in many cases, the publisher and the content creator will be identical

On laboratory/experiment setup level, there is

- the setup creator: collects contents of LiLa he might find suitable for a given context and creates a laboratory/experiment setup in this way. These contents can stem from different content creators. A setup creator can also be a content creator

On both the content level and the laboratory/experiment level, there can be one or many

- mediator(s): use(s) either a whole laboratory/experiment setup or single contents for a lecture/teaching. A mediator can also be a content creator and/or a setup creator

The given data model fits the functional requirements as well as aims and scopes of the application profile. With the given description set profiles and metadata elements, the laboratory resources can be described, combined, made searchable, assessable, retrievable, and exchangeable.



4 Overview of LiLa AP elements

In this chapter, an overview of the metadata elements used to describe the laboratory / experiment setup and the online laboratory contents will be given.

Table 1 gives an overview of namespaces used in table 2:

Vocabulary name	Namespace URI	Prefix
Dublin Core Metadata Element Set, Version 1.1	http://purl.org/dc/elements/1.1/	dc:
DCMI Metadata Terms	http://purl.org/dc/terms/	dcterms:
LiLa encoding schemes		LiLaterms:
GEM	http://purl.org/gem/instance/	gem:

Table 1: overview of namespaces used in table 2.

Table 2 shows the metadata elements for the laboratory/experiment setup.

(Dublin Core) Name	LiLa Label	Obl.	Defined By	Repeat.	Encoding Schemes
Title	Title	m	DC simple	-	-
Creator	Setup Creator	m	DC simple	X	-
Description	Description	m	DC simple	X	-
Subject	Subject	m	DC simple	X	LCSH, DDC
Identifier	Identifier	m	DC simple	-	-
Language	Language	m	DC simple	X	ISO639-2
Publisher	Publisher	m	DC simple	-	-
AccessRights	Access Rights	m	DC qualified	-	-
Requires	Technical Requirements	m	DC qualified	X	-
License	License	m	DC qualified	-	-
RequirementURI	Requirement URI	r		X	-
Alternative	Alternative Title	r	DC qualified	X	
DateModified	Modification Date	r	DC qualified	-	W3C-DTF
Extent	Duration	r	DC qualified	-	
EducationLevel	Education Level	r	DC qualified	-	LiLa levels
Mediator	Mediator	r	DC qualified	X	-
Has Part	Has Part	r	DC qualified	X	-
Relation	Related Resources	r	DC simple	X	-
InstructionalMethod	Instructional Method	o	DC qualified	-	GEM
Contributor	Additional Contributor	o	DC simple	X	-
Source	References	o	DC simple	X	-
Available	Available	o	DC qualified	-	W3C-DTF

Table 2: metadata elements for the laboratory/experiment setup.

Table 3 shows the metadata elements for the contents of a laboratory / experiment setup.

(Dublin Core) Name	LiLa Label	Obl.	Defined By	Repeat.	Encoding Schemes
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Type	Content Type	m	DC simple	-	LiLa types
Title	Title	m	DC simple	-	-
Creator	Content Creator	m	DC simple	X	-
Description	Description	m	DC simple	X	-
Subject	Subject	m	DC simple	X	LCSH, DDC
Identifier	Identifier	m	DC simple	-	-
Language	Content Language	m	DC simple	X	ISO639-2
Issued	Upload Date	m	DC qualified	X	W3C-DTF
AccessRights	Access Rights	m	DC qualified	-	-
License	License	m	DC qualified	-	-
Requires	Technical Requirements	m	DC qualified	X	-
RequirementURI	Requirement URI	r		X	-
Alternative	Alternative Title	r	DC qualified	X	
Extent	Duration	r	DC qualified	-	-
EducationLevel	Education Level	r	DC qualified	-	LiLa levels
Mediator	Mediator	r	DC qualified	X	-
Is Part Of	Is Part Of	r	DC qualified	X	-
Relation	Related Resources	r	DC simple	X	-
Publisher	Content Publisher	o	DC simple	-	-
InstructionalMethod	Instructional Method	o	DC qualified	-	GEM
Format	File Format	o	DC simple	-	MIME
Contributor	Additional Contributor	o	DC simple	X	-
Source	References	o	DC simple	X	-
Available	Available	o	DC qualified	-	W3C-DTF

Table 3: metadata elements for the contents of a laboratory / experiment setup.



5 The LiLa AP elements in detail – the description set profiles

In this chapter the metadata elements of the online laboratory resources will be described and specified in detail.

The properties are described in tables – with one table for each property. The fields of these tables and their meaning are listed in table 4.

Label	LiLa AP name of the term
URI	Specifies the URI of the given term
Term name	(Dublin Core) name of the term; abbreviation for the term URI
Defined by	Name and URI of the metadata vocabulary of the given term
Type of term	Specifies the type of the term according to the Dublin Core Metadata Initiative Abstract Model (DCAM) as class, property, syntax encoding scheme, vocabulary encoding scheme)
Refines	Specifies the property which is refined by the given term
Definition in LiLa AP	Specifies the definition of the given term in the LiLa AP context which will be based on the DC definitions in most cases
Comments and best practice examples	Recommendations on how to use this term
Encoding schemes	Name and URI of the syntax encoding scheme and/or the vocabulary encoding scheme, if applicable
Obligation	Specifies whether filling in this term is mandatory (m), recommended (r), or optional (o)
Repeatable	Specifies whether the term can be repeated
Pica field for mapping	Specifies the Pica library catalogue field which corresponds to the LiLa AP field
LOM field for mapping	Specifies the LOM field which corresponds to the LiLa AP field

Table 4: fields of tables and their meanings used to describe the properties.

First, the class “laboratory/experiment setup” and its properties will be specified in section 5.1. Then, in section 5.2, we will present the class “contents” and the connected properties. Section 5.3 lists the vocabulary encoding schemes, section 5.4 the syntax encoding schemes and section 5.4 specifies the vocabulary encoding schemes created for the LiLa AP.



5.1 Class “laboratory/experiment setup” and the description set profile properties

Label	Laboratory/experiment setup
URI	
Term name	LiLaterms:LabExpSetup
Defined by	
Type of term	Class
Definition in LiLa AP	A laboratory/experiment setup is a (virtual) container for collecting different LiLa contents.
Comments and best practice examples	Setup creators can group different contents (from different content creators) like virtual/remote experiments and other (books, exercises, videos, e-learning courses, tutoring systems, ...) together in order to create a laboratory/experiment setup. These laboratory/experiment setups can be used by mediators for lectures and teaching purposes.

Label	Title
URI	http://purl.org/dc/elements/1.1/title
Term name	dc:title
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	The name given to the described LiLa laboratory/experiment setup.
Comments and best practice examples	The title is the name of the laboratory/experiment setup that is described such as “The ideal gas” or “Coupled pendula”. The title should be given in English. The title in alternative languages should be deposited as “alternative title”.
Encoding schemes	-
Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	general.title

Label	Setup Creator
URI	http://purl.org/dc/terms/creator
Term name	dc:creator
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-



Definition in LiLa AP	A person, institute or service responsible for making the laboratory/experiment setup.
Comments and best practice examples	The setup creator makes a laboratory/experiment setup by collecting and grouping different LiLa contents that he might find useful for illustrating a given scientific principle. The setup creator can but does not need to be a content creator. Typically, the name of a setup creator should be used to indicate the entity. In most cases, the creator will be identical to the publisher of a laboratory/experiment setup.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	lifecycle.contribute when lifecycle.contribute.role has a value of "Author"

Label	Description
URI	http://purl.org/dc/elements/1.1/description
Term name	dc:description
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	Specification of the contents of the laboratory/experiment setup.
Comments and best practice examples	As a description may be deposited: an abstract/a summary/a text, a table of contents, a graphical representation of the laboratory/experiment setup.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	general.Ddescription

Label	Subject
URI	http://purl.org/dc/elements/1.1/subject
Term name	dc:subject
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	Topic of the LiLa laboratory/experiment setup.
Comments and best practice examples	The topics of a LiLa laboratory/experiment setup are specified using key words of the Library of Congress Subjects Headings (LCSH) and



	classifications of the Dewey Decimal Classification System (DDC). It is recommended to use a maximum of five key words . A separate statement should be used for each key word or each subject descriptor.
Encoding schemes	dcterms:LCSH (http://purl.org/dc/terms/LCSH) dcterms:DDC (http://purl.org/dc/terms/DDC)
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	general.keywords. For those wishing more specificity of Subject, a category of classification can be used with a purpose of "Subject". classification has elements for description, keywords, and taxonpath(s) that are specific for the purpose.

Label	Identifier
URI	http://purl.org/dc/terms/identifier
Term name	dc:identifier
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	An unambiguous reference to the laboratory/experiment setup.
Comments and best practice examples	For identification of a laboratory/experiment setup, we recommend to use Uniform Resource Identifier (URI), or more specific, a persistent identifier like the Uniform Resource Name (URN) or the Digital Object Identifier (DOI). An automatic assignment of an identifier to a online laboratory resource should be taken into consideration and discussed.
Encoding schemes	dcterms:URI (http://purl.org/dc/terms/URI)
Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	general.catalogentry. greneral.identifier is currently a RESERVED term, as there is no specified method for creation of a GUID

Label	Language
URI	http://purl.org/dc/elements/1.1/language
Term name	dc:language
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-



Definition in LiLa AP	A language of a LiLa laboratory/experiment setup.
Comments and best practice examples	The language(s) in which a LiLa laboratory/experiment setup is available should be specified using a three-letter language code from the controlled vocabulary ISO639-2. For example: ENG, GER, SWE etc. If the resource is available in multiple languages, use a new statement for each language.
Encoding schemes	dcterms:ISO639-2 (http://purl.org/dc/terms/ISO639-2)
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	general.language

Label	Publisher
URI	http://purl.org/dc/terms/publisher
Term name	dc:publisher
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	A person, institution or service responsible for making the LiLa laboratory/experiment setup available online.
Comments and best practice examples	In most cases, the publisher will be identical to the setup creator.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	lifecycle.contribute when lifecycle.contribute.role has a value of "Publisher"

Label	Access Rights
URI	http://purl.org/dc/terms/accessRights
Term name	dcterms:accessRights
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:rights
Definition in LiLa AP	Information about who can access the LiLa laboratory/experiment setup.
Comments and best practice examples	This element indicates access conditions of the described laboratory/experiment setup, for example: "Requires registration", "Open content", "Parts of the laboratory/experiment setup require registration"... The access rights of the single contents in the laboratory/experiment



	setup can be taken from the single contents automatically. If there are different access rights for different contents in a laboratory/experiment setup, use multiple statements.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Technical Requirements
URI	http://purl.org/dc/terms/requires
Term name	dcterms:requires
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:relation
Definition in LiLa AP	A related resource that is required by the described LiLa laboratory/experiment setup to support its function, delivery, or coherence.
Comments and best practice examples	Statement about which software, plugins, distributions etc. are needed and which system requirements have to be met in order to use the laboratory/experiment setup. For example, "Requires installation of a PDF reader". For multiple requirements, repeat statement. The requirements can be taken automatically from the contents of the laboratory/experiment setup.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	License
URI	http://purl.org/dc/terms/license
Term name	dcterms:license
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:rights
Definition in LiLa AP	Information about rights held in and over the described laboratory/experiment setup, including legal documents.
Comments and best practice examples	A legal document giving official permission to do something with the resource. It informs the user and (potential) mediators about what they can do with the given resource,



	i.e. read, re-use, cite, etc. Where applicable, it is recommended, to use and refer an official license like a Creative Common license, for example.
Encoding schemes	-
Obligation	Mandatory
Repeatable	yes
Pica field for mapping	
LOM field for mapping	

Label	Requirement URI
URI	http://purl.org/dc/terms/requirementURI
Term name	lilaterms:requirementURI
Defined by	...
Type of term	Property
Refines	dc:relation
Definition in LiLa AP	The URI where the resource given in the field(s) requires can be retrieved.
Comments and best practice examples	If applicable, the URI of a resource required in the field dc:requires should be given, where this resource, e.g. a software, a plugin, or a distribution, can be downloaded or retrieved. Each requirement URI has to be connected uniquely to the corresponding requires field. For multiple requirement URIs, repeat statement. Also the requirement URIs can be taken automatically from the contents of the laboratory/experiment setup.
Encoding schemes	dcterms:URI (http://purl.org/dc/terms/URI)
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Alternative Title
URI	http://purl.org/dc/terms/alternative
Term name	dcterms:alternative
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:title
Definition in LiLa AP	An alternative name for the laboratory/experiment setup.
Comments and best practice examples	In this field, subtitles, additional or alternative titles can be given using repeated statements. Especially, this field should be used to deposit the title in alternative languages. In this case, the language should be indicated using a language tag.



Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Modification Date
URI	http://purl.org/dc/terms/modified
Term name	dcterms:modified
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:date
Definition in LiLa AP	Date on which the laboratory/experiment setup was changed.
Comments and best practice examples	This field should indicate when the described laboratory/experiment setup was modified using the W3C-DTF encoding scheme (if possible, YYYY-MM-DD; else, YYYY-MM or at least YYYY).
Encoding schemes	dcterms:W3CDTF (http://purl.org/dc/terms/W3CDTF)
Obligation	Recommended
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	Duration
URI	http://purl.org/dc/terms/extent
Term name	dcterms:extent
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:format
Definition in LiLa AP	The duration of going through the laboratory/experiment setup.
Comments and best practice examples	This field gives an impression on how much time the described laboratory/experiment setup will take approximately. For example, if it takes about half an hour to run the complete laboratory/experiment setup, the extent should be indicated as 00:30.
Encoding schemes	-
Obligation	Recommended
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	Education Level
URI	http://purl.org/dc/terms/educationLevel



Term name	dcterms:educationLevel
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:audience
Definition in LiLa AP	A class of entity, defined in terms of progression through an educational or training context, for which the described laboratory/experiment setup is intended.
Comments and best practice examples	This field shows the user which knowledge level is recommended for the laboratory/experiment setup; suggested is a classification like "School/Undergraduate/Graduate/Scientific Level".
Encoding schemes	-
Obligation	Recommended
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	Mediator
URI	http://purl.org/dc/terms/mediator
Term name	dcterms:mediator
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:audience
Definition in LiLa AP	An entity that mediates access to the laboratory/experiment setup and for whom the laboratory/experiment setup is intended or useful.
Comments and best practice examples	In the laboratory/experiment setup context, the mediator might be a teacher, teaching assistant, lecturer, professor etc., who use the laboratory/experiment setups for their courses. The mediator, the creator and the publisher can be identical.
Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Has Part
URI	http://purl.org/dc/terms/hasPart
Term name	dcterms:hasPart
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:relation
Definition in LiLa AP	A related content that is included either physically or logically in the described



	laboratory/experiment setup.
Comments and best practice examples	Reference to the connected manuals, descriptions, videos, exercises, etc. which are part of the described laboratory/experiment setup. Use the identifier to refer to these contents.
Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Related Resources
URI	http://purl.org/dc/terms/relation
Term name	dc:relation
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	A related laboratory/experiment setup.
Comments and best practice examples	Recommended best practice is to identify the related laboratory/experiment setup by means of a string conforming to a formal identification system as chosen for the field "identifier", e.g. a URN or DOI. If the mediator wants to refer another laboratory/experiment setup explicitly, he should deposit the identifier in this field. For example, if it makes sense to go through a similar laboratory/experiment setup, this can be mentioned here.
Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	relation.kind, relation.resource

Label	Instructional Method
URI	http://purl.org/dc/terms/instructionalMethod
Term name	dcterms: instructionalMethod
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	-
Definition in LiLa AP	A process, used to engender knowledge, attitudes and skills, that the described laboratory/experiment setup is designed to support.
Comments and best practice examples	Instructional Method will typically include ways of presenting instructional laboratory/experiment setup or conducting

	<p>instructional laboratory/experiment setup activities, patterns of learner-to-learner and learner-to-instructor interactions, and mechanisms by which group and individual levels of learning are measured. Instructional methods include all aspects of the instruction and learning processes from planning and implementation through evaluation and feedback.</p> <p>It is recommended to use a controlled vocabulary, e.g. the GEM vocabulary for instructional methods.</p> <p>The instructional methods can be taken automatically from the contents.</p>
Encoding schemes	GEM:
Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Additional Contributor
URI	http://purl.org/dc/elements/1.1/contributor
Term name	dc:contributor
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	An entity responsible for making contributions to the online laboratory resource.
Comments and best practice examples	<p>Examples of a contributor include a person, an organization, or a service. Typically, the name of a contributor should be used to indicate the entity (together with the creator).</p> <p>This field catches persons, organizations, or services other than the creator that were involved in the creation of the described resource.</p>
Encoding schemes	-
Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	<p>lifecycle.contribute with the type of contribution specified in lifecycle.contribute.role.</p> <p>lifecycle.contribute can be repeated</p>

Label	References
URI	http://purl.org/dc/terms/source
Term name	dcterms:source
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms



Type of term	Property
Refines	dc:relation
Definition in LiLa AP	A related resource from which the described laboratory/experiment setup is derived.
Comments and best practice examples	The described laboratory/experiment setup may be derived from the related resource in whole or in part, that should be cited. Recommended best practice is to identify the related resource by means of a string conforming to a formal identification system. For multiple sources, use multiple statements. The sources of contents can be taken automatically.
Encoding schemes	-
Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	relation.resource when the value of relation.kind is "IsBasedOn". This reduction is currently under consideration within the Dublin Core Community

Label	Available
URI	http://purl.org/dc/terms/available
Term name	dcterms:available
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:date
Definition in LiLa AP	Date (or range) that the laboratory/experiment setup resource became or will become available.
Comments and best practice examples	This field should indicate when the described laboratory/experiment setup will become or became available online or the range it will be available online using the W3C-DTF encoding scheme. For single dates use YYYY-MM-DD or at least YYYY-MM or YYYY. For ranges use YYYY-MM-DD – YYYY-MM-DD or equivalently, YYYY-MM – YYYY-M or YYYY-YYYY.
Encoding schemes	dcterms:W3CDTF (http://purl.org/dc/terms/W3CDTF)
Obligation	Optional
Repeatable	No
Pica field for mapping	
LOM field for mapping	

5.2 Class “content” and the description set profile properties

Label	Content
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URI	
Term name	LiLaterms:Content
Defined by	
Type of term	Class
Definition in LiLa AP	A content is a single LiLa online experiment or experiment-related resource.
Comments and best practice examples	Contents are virtual/remote experiments or other connected material (like lecture notes, exercises, videos, e-learning courses, tutoring systems, ...). The contents are made by content creators and used by setup creators in order to group them into laboratory/experiment setups. Mediators can use single contents for their lectures/teaching or entire laboratory/experiment setups.

Label	Content Type
URI	http://purl.org/dc/elements/1.1/type
Term name	dc:type
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	The nature of the described LiLa content.
Comments and best practice examples	In the framework of LiLa contents, three basic types are distinguished: virtual experiments, remote experiments, and other content. Other content may further be distinguished into research articles, manuals/experiment descriptions, exercises, lecture notes, books, e-learning course, ... It is recommended to develop a controlled vocabulary and use this as a vocabulary encoding scheme.
Encoding schemes	-
Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	educational.learningresourcetype

Label	Title
URI	http://purl.org/dc/elements/1.1/title
Term name	dc:title
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	The name given to the described LiLa content.
Comments and best practice examples	The title is the name of the content, i.e. the virtual/remote experiment, the book, the

	lecture (notes), the exercises, the manual, the e-learning course, ... The title should be given in English. The title in alternative languages should be deposited as "alternative title".
Encoding schemes	-
Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	general.title

Label	Content Creator
URI	http://purl.org/dc/terms/creator
Term name	dc:creator
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	A person, institute or service responsible for making the described LiLa content.
Comments and best practice examples	Typically, the name of a creator should be used to indicate the entity. In many cases, the creator will be identical to the publisher. Furthermore, the content creator can be a mediator and/or a setup creator.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	lifecycle.contribute when lifecycle.contribute.role has a value of "Author"

Label	Description
URI	http://purl.org/dc/elements/1.1/description
Term name	dc:description
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	An account of the described LiLa content.
Comments and best practice examples	As a description may be deposited: an abstract/a summary/a text sample (of a research article, an e-learning course, of lecture notes, of a book, ...), a table of contents (of a book, of an e-learning course, lecture notes, ...), a graphical representation (of the experiment, of the movie, ...) etc.
Encoding schemes	-
Obligation	Mandatory



Repeatable	Yes
Pica field for mapping	
LOM field for mapping	general.Ddescription

Label	Subject
URI	http://purl.org/dc/elements/1.1/subject
Term name	dc:subject
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	Topic of the described LiLa content.
Comments and best practice examples	The topics of a LiLa content are specified using key words of the Library of Congress Subjects Headings (LCSH) and classifications of the Dewey Decimal Classification System (DDC). It is recommended to use a maximum of five key words. A separate statement should be used for each key word or each subject descriptor.
Encoding schemes	dcterms:LCSH (http://purl.org/dc/terms/LCSH) dcterms:DDC (http://purl.org/dc/terms/DDC)
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	general.keywords. For those wishing more specificity of Subject, a category of classification can be used with a purpose of "Subject". classification has elements for description, keywords, and taxonpath(s) that are specific for the purpose.

Label	Identifier
URI	http://purl.org/dc/terms/identifier
Term name	dc:identifier
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	An unambiguous reference to the online laboratory resource.
Comments and best practice examples	For identification of LiLa content, we recommend to use Uniform Resource Identifier (URI), or more specific, a persistent identifier like the Uniform Resource Name (URN) or the Digital Object Identifier (DOI). An automatic assignment of an identifier to a LiLa content should be taken into consideration and discussed.
Encoding schemes	dcterms:URI (http://purl.org/dc/terms/URI)



Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	general.catalogentry. general.identifier is currently a RESERVED term, as there is no specified method for creation of a GUID

Label	Content Language
URI	http://purl.org/dc/elements/1.1/language
Term name	dc:language
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	A language of a LiLa resource.
Comments and best practice examples	The language(s) in which a LiLa content is available should be specified using a three-letter language code from the controlled vocabulary ISO639-2. For example: ENG, GER, SWE etc. If the content is available in multiple languages, use a new statement for each language.
Encoding schemes	dcterms:ISO639-2 (http://purl.org/dc/terms/ISO639-2)
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	general.language

Label	Upload Date
URI	http://purl.org/dc/terms/issued
Term name	dcterms:issued
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	dc:date
Definition in LiLa AP	Date on which the described LiLa content was issued or first uploaded
Comments and best practice examples	This field should indicate when the described content was issued using the W3C-DTF encoding scheme (if possible, YYYY-MM-DD; else, YYYY-MM or at least YYYY).
Encoding schemes	dcterms: W3CDTF (http://purl.org/dc/terms/W3CDTF)
Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	



Label	Access Rights
URI	http://purl.org/dc/terms/accessRights
Term name	dcterms:accessRights
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:rights
Definition in LiLa AP	Information about who can access the LiLa resource.
Comments and best practice examples	This element indicates access conditions of the described LiLa content, for example: "Requires registration", "Open content", ...
Encoding schemes	-
Obligation	Mandatory
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	License
URI	http://purl.org/dc/terms/license
Term name	dcterms:license
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:rights
Definition in LiLa AP	Information about rights held in and over the described laboratory/experiment setup.
Comments and best practice examples	A legal document giving official permission to do something with the resource. It informs the user and (potential) mediators about what they can do with the given resource, i.e. read, re-use, cite, etc. Where applicable, it is recommended, to use and refer an official license like a Creative Common license, for example.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Technical Requirements
URI	http://purl.org/dc/terms/requires
Term name	dcterms:requires
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:relation

Definition in LiLa AP	A related resource that is required by the described resource to support its function, delivery, or coherence.
Comments and best practice examples	Statement about which software, plugins, distributions etc. are needed and which system requirements have to be met. For example, "Requires installation of a PDF reader". For multiple requirements, repeat statement.
Encoding schemes	-
Obligation	Mandatory
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Requirement URI
URI	http://purl.org/dc/terms/requirementURI
Term name	lilaterms:requirementURI
Defined by	...
Type of term	Property
Refines	dc:relation
Definition in LiLa AP	The URI where the resource given in the field(s) requires can be retrieved.
Comments and best practice examples	If applicable, the URI of a resource required in the field dc:requires should be given, where this resource, e.g. a software, a plugin, or a distribution, can be downloaded or retrieved. For multiple requirement URIs, repeat statement.
Encoding schemes	dcterms:URI (http://purl.org/dc/terms/URI)
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Alternative Title
URI	http://purl.org/dc/terms/alternative
Term name	dcterms:alternative
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:title
Definition in LiLa AP	An alternative name for the online laboratory resource.
Comments and best practice examples	In this field, subtitles, additional or alternative titles of the described LiLa content can be given using repeated statements. Especially, this field should be used to deposit the title in alternative languages. In this case, the language should be indicated using a language tag.



Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Duration
URI	http://purl.org/dc/terms/extent
Term name	dcterms:extent
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:format
Definition in LiLa AP	The duration of the content.
Comments and best practice examples	This field gives an impression on how much time the described LiLa content will take approximately. For example, if it takes about half an hour to run a remote experiment, the extent should be indicated as 00:30.
Encoding schemes	-
Obligation	Recommended
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	Education Level
URI	http://purl.org/dc/terms/educationLevel
Term name	dcterms:educationLevel
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:audience
Definition in LiLa AP	A class of entity, defined in terms of progression through an educational or training context, for which the described online laboratory resource is intended.
Comments and best practice examples	This field shows the user which knowledge level is recommended for the online laboratory resource; suggested is a classification like "School/Undergraduate/Graduate/Scientific Level".
Encoding schemes	-
Obligation	Recommended
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	Mediator
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URI	http://purl.org/dc/terms/mediator
Term name	dcterms:mediator
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:audience
Definition in LiLa AP	An entity that mediates access to the LiLa content and for whom the content is intended or useful.
Comments and best practice examples	In the LiLa content context, the mediator might be a teacher, teaching assistant, lecturer, professor etc., who uses the content for their courses. The mediator, the creator and the publisher can be identical.
Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Is Part Of
URI	http://purl.org/dc/terms/isPartOf
Term name	dcterms: isPartOf
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:relation
Definition in LiLa AP	A related laboratory/experiment setup in which the described content is physically or logically included.
Comments and best practice examples	The laboratory/experiment setup of which the described content, e.g. virtual experiment, remote experiment, manual, description, video, exercise/problem set etc., is part of. Use the identifier to refer to these laboratory/experiment setups.
Encoding schemes	-
Obligation	Recommended
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Related Resources
URI	http://purl.org/dc/terms/relation
Term name	dc:relation
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	A related online laboratory resource.



Comments and best practice examples	Recommended best practice is to identify the related online laboratory resource by means of a string conforming to a formal identification system as chosen for the field "identifier", e.g. a URN or DOI. If the mediator wants to refer another content explicitly, he/she should deposit the identifier in this field. For example, if it makes sense to do a similar experiment, this can be mentioned here.
Encoding schemes	-
Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	

Label	Content publisher
URI	http://purl.org/dc/terms/publisher
Term name	dc:publisher
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	A person, institution or service responsible for making the LiLa resource available on-line.
Comments and best practice examples	In many cases, the publisher will be identical to the content creator.
Encoding schemes	-
Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	lifecycle.contribute when lifecycle.contribute.role has a value of "Publisher"

Label	Instructional Method
URI	http://purl.org/dc/terms/instructionalMethod
Term name	dcterms: instructionalMethod
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	-
Definition in LiLa AP	A process, used to engender knowledge, attitudes and skills, that the described online laboratory resource is designed to support.
Comments and best practice examples	Instructional Method will typically include ways of presenting instructional content materials or conducting instructional content activities, patterns of learner-to-learner and learner-to-



	instructor interactions, and mechanisms by which group and individual levels of learning are measured. Instructional methods include all aspects of the instruction and learning processes from planning and implementation through evaluation and feedback. Examples are “experimental learning”, “observation”, “large group instruction”.
Encoding schemes	GEM:
Obligation	Optional
Repeatable	No
Pica field for mapping	
LOM field for mapping	

Label	File Format
URI	http://purl.org/dc/terms/format
Term name	dcterms:format
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:format
Definition in LiLa AP	The file format of the online laboratory resource.
Comments and best practice examples	Recommended best practice is to use a controlled vocabulary such as the list of Internet Media Types [MIME].
Encoding schemes	-
Obligation	Optional
Repeatable	No
Pica field for mapping	
LOM field for mapping	technical.format

Label	Contributor
URI	http://purl.org/dc/elements/1.1/contributor
Term name	dc:contributor
Defined by	Dublin Core Metadata Element Set, Version 1.1, http://purl.org/dc/elements/1.1/
Type of term	Property
Refines	-
Definition in LiLa AP	An entity responsible for making contributions to the described LiLa content.
Comments and best practice examples	Examples of a contributor include a person, an organization, or a service. Typically, the name of a contributor should be used to indicate the entity (together with the creator). This field catches persons, organizations, or services other than the creator that were involved in the creation of the described content.
Encoding schemes	-



Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	lifecycle.contribute with the type of contribution specified in lifecycle.contribute.role. lifecycle.contribute can be repeated

Label	References
URI	http://purl.org/dc/terms/source
Term name	dcterms:source
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:relation
Definition in LiLa AP	A related resource from which the described LiLa content is derived.
Comments and best practice examples	The described content may be derived from the related resource in whole or in part, that should be cited. Recommended best practice is to identify the related resource by means of a string conforming to a formal identification system.
Encoding schemes	-
Obligation	Optional
Repeatable	Yes
Pica field for mapping	
LOM field for mapping	relation.resource when the value of relation.kind is "IsBasedOn". This reduction is currently under consideration within the Dublin Core Community

Label	Available
URI	http://purl.org/dc/terms/available
Term name	dcterms:available
Defined by	DCMI Metadata Terms, http://purl.org/dc/terms
Type of term	Property
Refines	dc:date
Definition in LiLa AP	Date (or range) that the content became or will become available.
Comments and best practice examples	This field should indicate when the described content will become or became available on-line or the range it will be available online using the W3C-DTF encoding scheme. For single dates use YYYY-MM-DD or at least YYYY-MM or YYYY. For ranges use YYYY-MM-DD – YYYY-MM-DD or equivalently, YYYY-MM – YYYY-M or YYYY-YYYY.
Encoding schemes	dcterms: W3CDTF (http://purl.org/dc/terms/W3CDTF)
Obligation	Optional
Repeatable	No
Pica field for mapping	



LOM field for mapping	
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5.3 Vocabulary encoding schemes

Label	LiLa content type
URI	http://URI...XXX
Term name	LiLaterms:LiLaType
Defined by	LiLa online laboratory terms, http://XXX
Type of term	Vocabulary Encoding Scheme
Definition in LiLa AP	The LiLa content type vocabulary encoding scheme specifies a controlled vocabulary for the different online laboratory contents.
Comments	We specify “virtual laboratory”, “remote laboratory”, and “other”.
See	-
Used as encoding scheme for	Content Type

Label	LiLa education level
URI	http://URI...XXX
Term name	LiLaterms:LiLaEducationLevel
Defined by	LiLa online laboratory terms, http://XXX
Type of term	Vocabulary Encoding Scheme
Definition in LiLa AP	The LiLa education level specifies a controlled vocabulary for the education level that is recommended in order to go through a content or laboratory/experiment setup.
Comments	We specify the levels “school level”, “undergraduate level”, “graduate level”, “scientific level”.
See	-
Used as encoding scheme for	Education Level (Laboratory/experiment setup) Education Level (content)

Label	DDC
URI	http://purl.org/dc/terms/DDC
Term name	dcterms:DDC
Defined by	Dublin Core Terms, http://purl.org/dc/terms
Type of term	Vocabulary Encoding Scheme
Definition in LiLa AP	The set of conceptual resources specified by the Dewey Decimal Classification.
Comments	-
See	http://www.oclc.org/dewey/
Used as encoding scheme for	Subject (laboratory/experiment setup) Subject (content)

Label	LCSH
URI	http://purl.org/dc/terms/LCSH
Term name	dcterms:LCSH
Defined by	Dublin Core Terms, http://purl.org/dc/terms
Type of term	Vocabulary Encoding Scheme
Definition in LiLa AP	The set of labeled concepts specified by the Library of Congress Subject Headings.
Comments	-
See	-
Used as encoding scheme for	Subject (laboratory/experiment setup) Subject (content)

Label	GEM Instructional Method Vocabulary
URI	http://purl.org/gem/instance/GEM-TM/
Term name	gem:InstMethod
Defined by	GEM Consortium, http://purl.org/gem/instance
Type of term	Vocabulary Encoding Scheme
Definition in LiLa AP	Words and phrases that describe ways of presenting instructional materials or conducting instructional activities in the area of LiLa contents.
Comments	
See	-
Used as encoding scheme for	Instructional Method (laboratory/experiment setup) Instructional Method (content)

Label	MIME tye list
URI	http://www.iana.org/assignments/media-types/
Term name	iana:MIMETypelist
Defined by	iana, http://www.iana.org/assignments/media-types/
Type of term	Vocabulary Encoding Scheme
Definition in LiLa AP	
Comments	
See	-
Used as encoding scheme for	Format (content)

5.4 Syntax encoding schemes

Label	ISO 639-2
URI	http://purl.org/dc/terms/ISO639-2



Term name	dcterms:ISO639-2
Defined by	Dublin Core Terms, http://purl.org/dc/terms
Type of term	Datatype (Syntax Encoding Scheme)
Definition in LiLa AP	The three-letter alphabetic codes listed in ISO639-2 for the representation of names of languages.
Comments	-
See	http://lcweb.loc.gov/standards/iso639-2/langhome.html
Used as encoding scheme for	Setup Language (laboratory/experiment setup) Content Language (content)

Label	W3C-DTF
URI	http://purl.org/dc/terms/W3CDTF
Term name	dcterms: W3CDTF
Defined by	Dublin Core Terms, http://purl.org/dc/terms
Type of term	Datatype (Syntax Encoding Scheme)
Definition in LiLa AP	The set of dates and times constructed according to the W3C Date and Time Formats Specification.
Comments	-
See	http://www.w3.org/TR/NOTE-datetime
Used as encoding scheme for	Date Modified (laboratory/experiment setup) Available (laboratory/experiment setup) Date Modified (content) Available (content)

Label	URI
URI	http://purl.org/dc/terms/URI
Term name	dcterms:URI
Defined by	Dublin Core Terms, http://purl.org/dc/terms
Type of term	Datatype (Syntax Encoding Scheme)
Definition in LiLa AP	The set of identifiers constructed according to the generic syntax for Uniform Resource Identifiers as specified by the Internet Engineering Task Force.
Comments	-
See	http://www.ietf.org/rfc/rfc3986.txt
Used as encoding scheme for	

5.5 LiLa specific vocabulary

5.5.1 LiLa content type vocabulary

Label	Remote laboratory
URI	http://URI...XXX/RemoteLaboratory

Term name	LiLaterms:RemoteLaboratory
Defined by	LiLa content type terms, http://XXX
Type of term	Class
Definition in LiLa AP	tbd
Comments	
See	-
Member of	LiLaterms:LiLaType, URI

Label	Virtual laboratory
URI	http://URI...XXX/VirtualLaboratory
Term name	LiLaterms:VirtualLaboratory
Defined by	LiLa content type terms, http://XXX
Type of term	Class
Definition in LiLa AP	tbd
Comments	
See	-
Member of	LiLaterms:LiLaType, URI

Label	Other
URI	http://URI...XXX/Other
Term name	LiLaterms:Other
Defined by	LiLa content type terms, http://XXX
Type of term	Class
Definition in LiLa AP	tbd
Comments	
See	-
Member of	LiLaterms:LiLaType, URI

5.5.2 LiLa education level vocabulary

Label	School Level
URI	http://URI...XXX/SchoolLevel
Term name	LiLaterms:SchoolLevel
Defined by	LiLa education level terms, http://XXX
Type of term	Class
Definition in LiLa AP	tbd
Comments	
See	-
Member of	LiLaterms:LiLaEducationLevel, URI

Label	Undergraduate Level
URI	http://URI...XXX/UndergraduateLevel
Term name	LiLaterms:UndergraduateLevel
Defined by	LiLa education level terms, http://XXX
Type of term	Class
Definition in LiLa AP	tbd
Comments	
See	-



Member of	LiLaterms:LiLaEducationLevel, URI
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Label	Graduate Level
URI	http://URI...XXX/GraduateLevel
Term name	LiLaterms:GraduateLevel
Defined by	LiLa education level terms, http://XXX
Type of term	Class
Definition in LiLa AP	dkjl
Comments	
See	-
Member of	LiLaterms:LiLaEducationLevel, URI

Label	Scientific Level
URI	http://URI...XXX/ScientificLevel
Term name	LiLaterms: ScientificLevel
Defined by	LiLa education level terms, http://XXX
Type of term	tbd
Definition in LiLa AP	dkjl
Comments	
See	-
Member of	LiLaterms:LiLaEducationLevel, URI