Overview of Metadata Standards for Learning Resources: Lessons for the Learning Resource Metadata Initiative

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Abstract

A review of online educational resource repositories, metadata standards, academic research regarding such standards, and the uses of such metadata "in the wild" was conducted. This paper appears just as a new effort, the Learning Resource Metadata Initiative ("LRMI"), co-led by Creative Commons and the Association of Educational Publishers, begins to form a working group to create a common metadata vocabulary for describing learning resources. LRMI is motivated by the growing need to make online learning resources more discoverable and the opportunity created by the launch of schema.org, a Bing/Google/Yahoo! project to develop and encourage use of metadata vocabularies which can be used to enhance search results. This paper provides a current overview of the learning metadata landscape, attempts to frame key questions that the LRMI effort should address in order to reach its stated goals, and provides recommendations to assist in the LRMI effort's success.

Keywords: educational metadata, standards, learning resources, learning objects, resource description, IEEE LOM Standard, Learning Object Metadata, application profiling, Dublin Core, repositories, OAI-PMH, LRMI, schema.org

1. Introduction[†]

1.1 What is metadata?

Metadata is essentially data about other data. More formally, metadata has been defined as "structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage an information resource." (NISO, 2004).

1.2 Learning objects

Learning objects have been defined as any entity (digital or non-digital) that may be used for learning, education or training. (IEEE LTSC, 2002). Learning objects are also called learning resources, with "resource" taking on a similar meaning to that in Resource Description Framework (RDF). (Ogbuji, 2003; W3C 2004) Learning objects are hugely diverse and can include not only journal articles, books, and lesson plans, but also may encompass repositories, social sites and forums, blogs, a photo or video stream, or a private webpage. This diversity poses challenges for deciding how to describe resources.

1.3 Metadata schemes and standards

Metadata elements grouped into sets designed for a specific purpose, e.g., for a specific domain or a particular type of information resource, are called metadata schemes. The number of learning resources online is large, with some repositories containing millions of resources, and the number of such resources is growing rapidly. If these resources are described by incompatible schemes, then our attempt to discover, manage, and use resources is complicated and may be thwarted. Consistent interoperable metadata about those resources has thus long been preferred. Standards attempt to address this problem by defining a structure for interoperable descriptions of learning resources.

2. Metadata Standards for Learning Resources

Because of the diversity of objects that can be considered learning resources, the potentially relevant metadata standards can encompass diverse standards efforts, of which there are many. (Riley 2010a; Barker, 2008). This section summarizes three efforts most closely-aligned with

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attempts at standardization where the focus has been on learning resources: the Institute of Electrical and Electronics Engineers Learning Object Metadata (IEEE LOM) standard, the Dublin Core Metadata Initiative Metadata Terms (DC Terms aka Qualified Dublin Core), and the International Organization of Standards Metadata for Learning Resources (ISO MLR) standard.

2.1 IEEE LOM

For learning objects, IEEE's Learning Object Metadata (LOM) has had a powerful presence. (IEEE LTSC, 2002). LOM was developed and formalized through the IEEE and their Learning Technology Standards Committee (LTSC) and was built upon the prior work of the IMS Global Learning Consortium and the ARIADNE Project. (IMS, 2006). The stated purpose of the LOM multi-part standard is to "facilitate search, evaluation, acquisition, and use of learning objects, for instance by learners or instructors or automated software processes. This multi-part standard also facilitates the sharing and exchange of learning objects, by enabling the development of catalogs and inventories while taking into account the diversity of cultural and lingual contexts in which the learning objects and their metadata are reused." (IEEE LTSC, 2002).

LOM data elements are grouped into nine top-level categories:

1. General
2. Life Cycle
3. Meta-Metadata
4. Technical
5. Educational
6. Rights
7. Relation
8. Annotation
9. Classification

The *LOM standard* is a "conceptual data schema" for the description of learning objects. Implementations of LOM are called application profiles which are "schemas which consist of data elements drawn from one or more namespaces,[1] combined together by implementors, and optimised for a particular local application." (Heery et al, 2000). For example, LOM's derivatives UK LOM core (CETIS, 2004) and Cancore (Friesen et al, 2004a) are standards developed by the UK and Canada respectively to identify common practices in their respective countries. Implementations of the LOM standard interpret many of its aspects, including definitions of element semantics, or sometimes provide a structured vocabulary for certain

[1] 'Namespace' is defined within the W3C XML schema activity and allows for unique identification of elements. Within the W3C XML and RDF schema specifications, namespaces are the domain names associated with elements which, along with the individual element name, produce a URL that uniquely identifies the element. (Bray et al, 2009).

elements. Thus, an application profile is, for some specified group, an agreed-upon way of using IEEE LOM.

With sub-categories, the number of elements reaches 76 (*see* Figure 1), although the majority of application profiles of LOM adopt a subset of the elements as mandatory or desirable. A comparison of how various applications profiles treat each element is provided in Appendix A.

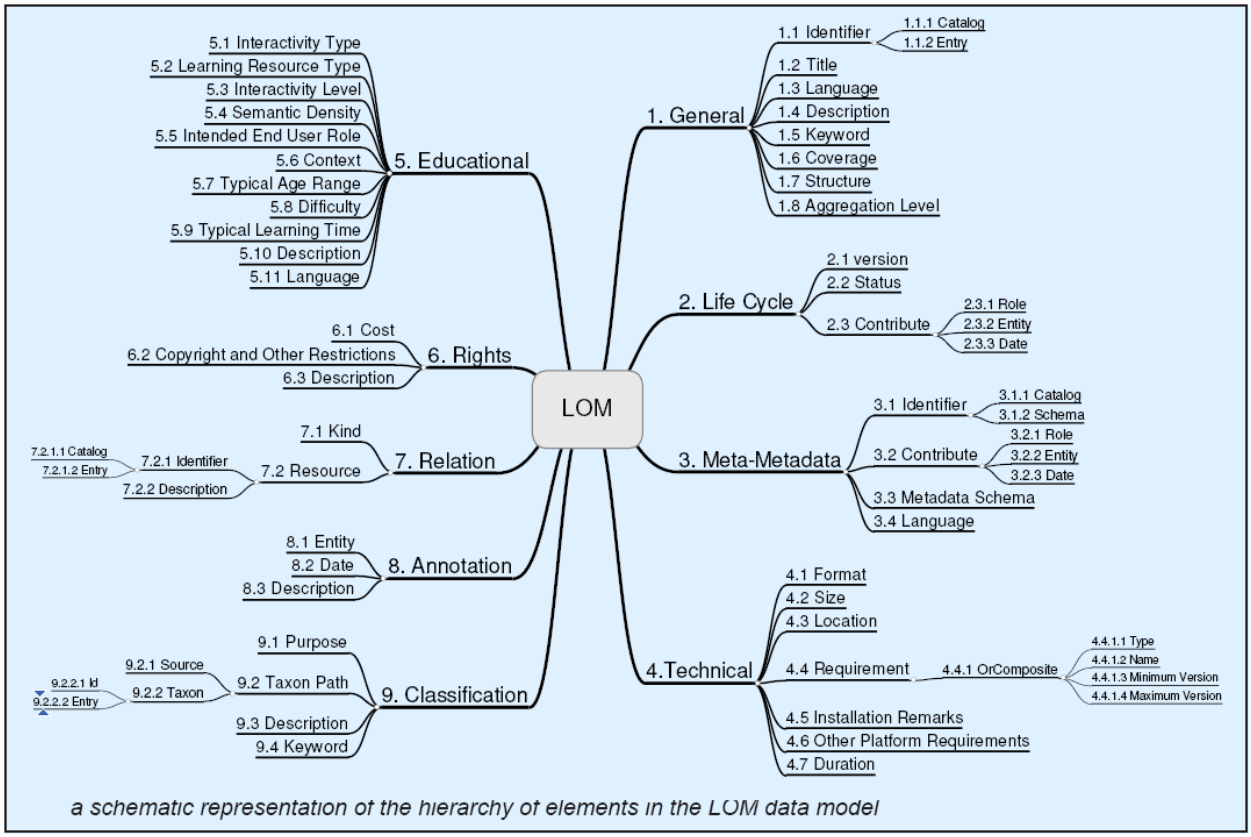

Figure 1: Image from Phil Barker, *What is IEEE Learning Object Metadata / IMS Learning Resource Metadata?* , CETIS Standards Briefings Series , http://metadata.cetis.ac.uk/guides/WhatIsLOM.pdf (2005).

2.1.1 IEEE LOM Application Profiles

There have been numerous efforts to create application profiles of the LOM standard. The following section summarizes several of these efforts.[2]

[2] An early application profile from Singapore's Information Technology Standards Committee, SingCORE (2001), customized the LOM standard for local Singapore needs, but is not discussed here because so little about the profile is freely available online. Standards documents are instead available for a fee. *See* http://www.singaporestandardseshop.sg/

CanCore (Canada, v. 2.0 Nov. 2003)

CanCore provides detailed guidance for the interpretation and implementation of data elements in the LOM standard. These guidelines constitute a 250-page document, and have been developed over several years under the leadership of the CanCore Initiative's director, Norm Friesen, and through consultation with experts across Canada and throughout the world. Unlike many other standards documents, these guidelines are available at no charge from the CanCore Website.[3] In 2006, Friesen described a proposal for a "better LOM" which has been pursued as (and became) the ISO MLR standard discussed below. (Friesen 2006).

UK LOM Core (United Kingdom, Draft 0.1 July 2003)

A family of application profiles for UK Further and Higher Education were based around the UK LOM Core. (CETIS, 2004). The UK LOM Core was intended to and did serve as the basis for other more specific application profiles, such as the RDN/LTSN application profile discussed below. Appendix 3 of the UK LOM Core specification presents a chart comparing a dozen LOM application profiles to illustrate which LOM elements each application profile specified as mandatory, recommended, or optional. Appendix A of this paper presents a similar chart. UK LOM Core is no longer under active development.

RDN/LTSN (United Kingdom, v. 1.0 2003)

The Resource Discovery Network (RDN) was a national service funded by the United Kingdom's Joint Information Systems Committee (JISC) to provide access to high quality Internet resources for the UK Further and Higher Education communities. The Learning and Teaching Support Network (LTSN) was an initiative of the United Kingdom higher education bodies to promote high quality learning and teaching in all subject disciplines in higher education.[4]

The primary purpose of this application profile was to support record sharing between RDN and LTSN services using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), discussed below in section 2.2.8. (Powell, 2003; OAI, 2008; Powell & Barker, 2004). However, this application profile was also designed to be used by an LTSN Learning and Teaching Portal and was to be treated as a candidate application profile for use by JISC's Exchange for Learning (X4L) projects.

Vetadata (Australia, 2005)

The Australian Vocational Education and Training (VET) sector uses an application profile of the IEEE LOM called Vetadata. (Commonwealth of Australia, 2010). In addition to the Vetadata schema, there is a set of VET-related vocabularies, which are recommended for the description of category 9 elements and the Learning Resource Type element in category 5. Vocabularies have been identified for the description of industry, qualification levels, competencies, subject and resource types. XML bindings (XML schema) and example metadata files for Vetadata are

[3] *See* http://cancore.athabascau.ca/en/guidelines.html

[4] In May 2004 the LTSN merged with the Institute for Learning and Teaching in Higher Education (ILTHE) and the TQEF National Co-ordination Team (NCT) to form the Higher Education Academy.

also available. The Vetadata effort is notable for additionally providing several software tools for use in creating, packaging, and describing e-learning content. (Australian Flexible Learning Framework, n.d.).

ANZ-LOM (Australia & New Zealand, v. 1.01 May 2008, v. 1.02 Mar. 2011)

ANZ-LOM is a metadata profile developed for the education sector in Australia and New Zealand and now maintained by Education Services Australia (ESA). (ESA, 2011). The ANZ-LOM profile was first published by The Le@rning Federation (TLF) in January 2008. (Sunter, 2008). The Le@rning Federation (TLF) has previously published TLF metadata application profiles that focused on supporting production of learning content. ANZ-LOM is a more widely applicable standard that also replaces earlier TLF metadata profiles.

NORLOM (Norway, started February 2007, v. 1.1 Oct. 2008)

NORLOM is a Norwegian LOM profile managed by the Norwegian Secretariat for Standardization of Learning Technologies (NSSL). (NSSL, 2008). NORLOM was based largely on the CELEBRATE application profile (IST, 2003) and UK LOM Core was also a source of inspiration.

LORElom (Netherlands, last updated Feb. 2009)

LORElom resulted from a collaboration between Stichting Kennisnet, the SURFfoundation, the Dutch Digital University, and LOREnet affiliated schools. (SURFfoundation, 2009). The application profile was intended for those parties that are participating in LOREnet, the Learning Objects REpository network, or the HBO Knowledge Base, which offers public access to the results of research done by Dutch universities of applied science. The Digital Academic Repositories (DARE) initially made use of agreements based on the Dublin Core standard. (SURFfoundation, 2004). With storage and access to publications by means of complex objects on the increase, the Metadata Object Description Schema (MODS)[5] was selected as the standard metadata format for all Dutch repositories. Metadata experts at the various Dutch institutions then worked on developing LORElom to satisfy the need for a more accurate description of repository contents. The Dutch association EduStandaard had also created an application profile, Content-zoekprofiel PO-VO-BVE (CZP) focused on primary, secondary, and vocational schools. (EduStandaard, 2006). Subsequently, these two Dutch efforts came together and now a single LOM application profile meant to harmonize LORElom and CZP, NL-LOM, has been developed. (SURFfoundation & Stichting Kennisnet, 2011).

LRE Metadata Application Profile (v. 4.6 June 2011)

An effort of European Schoolnet, the Learning Resource Exchange Metadata Application Profile uses the IEEE LOM metadata standard and the IMS LODE Information for Learning Object eXchange specification (ILOX) (Massart et al, 2010) in combination with multi-lingual controlled vocabularies to meet the needs of educators at the K-12 levels in Europe. The LRE maintains and utilizes a multi-lingual thesaurus (in 15 languages) to standardize the subject descriptions of learning resources.

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[5] *See* http://www.loc.gov/standards/mods/

2.1.2 A Software Tool for Creating an Application Profile

Numerous IEEE LOM application profiles have been developed. Despite the widespread development of application profiles "it seems that a limited number of software tools exist, aiming to support the process of IEEE LOM Application Profiling. Moreover, these tools have a number of limitations, adding extra barriers to their users in this process." (Chloros et al, 2010). A web-based tool (ASK-LOM-AP) "aims to overcome the identified limitations and simplify the process of developing and managing IEEE LOM APs for different educational communities." (Chloros et al, 2010). After registering and logging in at http://www.ask4research.info/asklomap/ one can step through the process of creating a LOM application profile.

2.1.3 The Advanced Distributed Learning (ADL) Initiative and the Sharable Content Object Reference Model (SCORM)

The Advanced Distributed Learning (ADL) Initiative is a project of the United States Department of Defense (DoD) that, among other goals, establishes guidelines on the use of standards and provides a mechanism to assist DoD and other Federal agencies in the large-scale development, implementation, and assessment of interoperable and reusable learning systems.

ADL produces the Sharable Content Object Reference Model (SCORM), which integrates a set of related technical standards, specifications, and guidelines designed to produce accessible, interoperable, durable, and reusable content and systems. (ADL, 2009). SCORM content can be delivered to learners via any SCORM-conformant Learning Management System (LMS) using the same version of SCORM. In addition to the metadata specification, the complete SCORM specifications include a description of a run-time environment which describes how an LMS is intended to process a SCORM content package and sequencing and navigation behavior, which allows an LMS to properly sequence a learner's activities to achieve the desired learning experience.

SCORM defines how to create "sharable content objects" or "SCOs" that can be reused in different systems and contexts. SCORM is not a standard, but a "Reference Model." SCORM references existing standards, such as IEEE LOM, and tells developers how to properly use them together. Many of the IEEE LOM application profiles explicitly note whether they make mandatory the LOM elements that SCORM mandated in earlier versions. There are currently no requirements defined in SCORM for the creation of metadata and the association of that metadata to the specific SCORM Content Model Components. As SCORM evolved, different communities presented different needs and ADL decided not to try to standardize them, especially because most communities extended that model to something more valuable.

SCORM has continuing relevance to those developing learning materials. In January 2011, the United States government made available two billion dollars to be used for Open Educational Resources (OER) in community colleges, where "All successful applicants that propose online and technology-enabled learning projects will develop materials in compliance with SCORM." (United States Department of Labor, 2011).

2.1.4 Implementations in XML and RDF

In addition to the conceptual data schema outlined in LOM documentation, there is a binding of the LOM model to XML (IEEE 1484.12.3). A possible XML representation may look like this (Ogbuji, 2003):

Figure 2. Possible XML format for LOM

```
<?xml version="1.0" encoding="UTF-8"?>
      <lom xmlns=http://www.imsglobal.org/xsd/imsmd_rootv1p2p1
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xsi:schemaLocation="http://www.imsglobal.org/xsd/imsmd_rootv1p2p1
      imsmd_rootv1p2p1.xsd">
      <general>
            <title> <langstring xml:lang="en">Introduction to WSDL</langstring
      </title>
      </general>
      <typicallearningtime>
            <datetime>PT69S</datetime>
      </typicallearningtime>
      <educational>
            <learningresourcetype>
            <source> <langstring xml:lang="x-none">IntendedUse</langstring>
      </source>
            <value> <langstring xml:lang="x-none">Introduction</langstring>
      </value>
            </learningresourcetype>
      </educational>
      <classification>
            <taxonpath>
               <source>
                 <langstring>Topics</langstring>
               </source>
              <taxon>
               <id>http://www.research.ibm.com/elearn#webservices</id>
               <entry>
                  <langstring>Web Services</langstring>
               </entry>
              </taxon>
             </taxonpath>
            </classification>
      </lom>
```

The Resource Description Framework, RDF, can also be used to express learning object metadata following the IEEE LOM standard. (Nilsson et al, 2003). However, IEEE's work on an RDF binding for LOM (IEEE 1484.12.4) never left draft status and development now continues within the joint DCMI/IEEE LTSC Taskforce.[6]

[6] Dublin Core Metadata Initiative (DCMI), *Joint DCMI/IEEE LTSC Taskforce*, http://dublincore.org/educationwiki/DCMIIEEELTSCTaskforce

2.2 Dublin Core

2.2.1 The Dublin Core Metadata Initiative (DCMI)

The Dublin Core Metadata Initiative (DCMI) has created metadata standards that support a broad range of purposes. The fifteen-element "Dublin Core" has been ratified as IETF RFC 5013, ANSI/NISO Standard Z39.85-2007, and ISO Standard 15836:2009. The DCMI is active, with several communities and task groups dedicated to specific topics related to Dublin Core metadata and it also hosts annual conferences and workshops.

2.2.2 Dublin Core Metadata Element Set (DC-MES)

The Dublin Core Metadata Element Set "is a vocabulary of fifteen properties for use in resource description. The name "Dublin" is due to its origin at a 1995 invitational workshop in Dublin, Ohio; "core" because its elements are broad and generic, usable for describing a wide range of resources." (DCMI, 2010a). These fifteen elements are: contributor, coverage, creator, date, description, format, identifier, language, publisher, relation, rights, source, subject, title, and type. This element set is also known as "Simple Dublin Core."

2.2.3 Qualified Dublin Core (QDC) / DC Terms

Qualified Dublin Core, also known as DC Terms, is an extension of Simple Dublin Core through the use of additional elements, element refinements, vocabulary and syntax encoding schemes,[7] classes, and a type vocabulary. Some content management systems, such as Dspace, operate on top of native Qualified Dublin Core models.[8]

2.2.4 The DCMI Abstract Model (DCAM)

The DCMI Abstract Model (DCAM) is a framework for the components of resource description and how they relate to one another. The structure of the DCAM is very similar to and inspired by the RDF model. The full model has three main sub-parts: the DCMI Resource Model, the DCMI Description Set Model, and the DCMI Vocabulary Model. (Powell et al, 2007). The Resource Model explains how resources are described using property-value pairs, the Description Set

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[7] Vocabulary encoding schemes are enumerated sets of resources that indicate that the value is a term from a controlled vocabulary, such as the value "China – History" from the Library of Congress Subject Headings. A syntax encoding scheme is a set of strings and an associated set of rules that describe a mapping between that set of strings and a set of resources. The mapping rules may define how the string is structured or they may simply enumerate all the strings and the corresponding resources. For example, a syntax encoding scheme may indicate that the value is a string formatted in accordance with a formal notation, such as "2002-08-31" as the standard expression of a date. (Powell et al, 2007).

[8] The Dspace Foundation, *Chapter 15. Dspace System Documentation: Appendices, 15.1. Default Dublin Core Metadata Registry*, http://www.dspace.org/1_5_2Documentation/ch15.html#docbook-appendix.html-dublincoreregistry

Model explains what features descriptions, each describing a single resource, must have to be considered a "description set" which is what one might loosely think of as the entire metadata record containing descriptions of the resource, its author, or even the metadata itself, and the Vocabulary Model explains that a "vocabulary" is simply a set of terms, where a term is a property (element), class, vocabulary encoding scheme, or syntax encoding scheme.

Following the development of the DCMI Abstract Model (DCAM), efforts have commenced to harmonize IEEE LOM with this model. (Riley, 2010b). "Concrete work on harmonizing IEEE LOM and Dublin Core is currently progressing within the Joint DCMI / IEEE LTSC Taskforce. The approach taken is that of reinterpretation of the IEEE LOM data elements in terms of a completely different abstract model – the DCMI Abstract Model. The resulting specifications make LOM elements reusable in Dublin Core and RDF metadata, but at the cost of imperfect translation." (Nilsson, 2008).

2.2.5 Dublin Core Education

While Dublin Core metadata schemes have long been used to describe learning resources, the DCMI Education Community is working on a DC-Education application profile describing usage of DCMI properties specifically relevant to education. This community is also engaged in the Joint DCMI / IEEE LTSC Taskforce.

2.2.6 Implementations in XML and RDF

There are official DCMI recommendations for expressing Dublin Core metadata using RDF. (Nilsson et al, 2008b) and a DCMI proposed recommendation for expressing Dublin Core description sets using XML (Johnston and Powell, 2008). Prior to the development of the DCMI Abstract Model, DCMI provided an official recommendation for expressing Dublin Core in XML (Powell and Johnston, 2003) which is not intended to represent description sets, necessitating the more recent work.

2.2.7 Mapping Dublin Core to IEEE LOM

There have been numerous groups or individuals that have provided mappings of the Dublin Core elements to IEEE LOM. Besides indicating a level of interoperability, such mappings may also provide an indicator of the more frequently used LOM elements. Figure 3 presents one such mapping. (SURFfoundation, n.d.)

DC	LOM
dc:identifier	1.1.2: /lom/general/identifier/entry
dc:title	1.2: /lom/general/title
dc:language	1.3: /lom/general/language
dc:description	1.4: /lom/general/description
dc:subject	1.5: /lom/general/keyword or 9: /lom/classification with 9.1: /lom/classification/purpose equals "discipline" or "idea".
dc:coverage	1.6: /lom/general/coverage
dc:type	5.2: /lom/educational/learningResourceType
dc:date	2.3.3: /lom/lifeCycle/contribute/date when 2.3.1: /lom/lifeCycle/contribute/role has a value of "publisher".
dc:creator	2.3.2: /lom/lifeCycle/contribute/entity when 2.3.1: /lom/lifeCycle/contribute/role has a value of "author".
dc:otherContributor	2.3.2: /lom/lifeCycle/contribute/entity with the type of contribution specified in 2.3.1: /lom/lifeCycle/contribute/role
dc:publisher	2.3.2: /lom/lifeCycle/contribute/entity when 2.3.1: /lom/lifeCycle/contribute/role has a value of "publisher".
dc:format	4.1: /lom/technical/format
dc:rights	6.3: /lom/rights/description
dc:relation	7.2.2: /lom/relation/resource/description
dc:source	7.2: /lom/relation/resource when the value of 7.1: /lom/relation/kind is "isBasedOn".

Figure 3: Mapping of Dublin Core to IEEE LOM (SURFfoundation, n.d.).

2.2.8 Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH)

OAI-PMH provides an application-independent interoperability framework for metadata harvesting from repositories. The OAI-PMH implementation guidelines state that repository implementers should consider exporting DC the first and most important step toward OAI-PMH interoperability and the guidelines often assume that repositories will map their metadata to the Dublin Core. (Lagoze et al., 2005). This has presumably been partially responsible for the uptake of Dublin Core by repositories, discussed further below in Section 4.

2.3 ISO Metadata for Learning Resources (ISO MLR)

This standard “aims to specify data elements relating to learning resources to be expressed in a range of established formats, providing optimal compatibility with IEEE 1484.12.1-2002 [IEEE LOM] and ISO 15836:2009 [Dublin Core metadata element set], while also addressing user-driven requirements and uses not explicitly addressed in those two standards. These data elements are used to form the description of a learning resource.” (ISO/IEC, 2011a).

The second part of the ISO MLR multi-part standard provides "a base-level data element set for the description of learning resources from the ISO 15836:2009 Dublin Core metadata element set, using the framework provided in ISO/IEC 19788-1." (ISO/IEC, 2011b).

3. Is There Consensus on the Most Important Metadata Elements for Learning Resources?

3.1 Comparing Application Profiles

Please see Appendix A for a chart illustrating which metadata elements are mandatory, recommended, optional, or not recommended across the various application profiles and standards surveyed. This data helps to answer the question of which elements are most frequently mandated or recommended for use or exclusion in application profiles.

"The LOM includes a multitude of pre-defined elements and complex structures, all of which were included for an envisaged need, but many of which do not seem to have been widely used. Evidence of this is recorded by Godby, 2004, and Friesen, 2004, however it is important to note that these papers date from very shortly after the LOM was standardized and it would be interesting to repeat these studies to ascertain whether practice has changed as understanding of the LOM has matured." (Barker & Campbell, 2010). While Godby and Friesen sampled learning objects from repositories that used LOM, the chart presented in Appendix A reflects only the recommendations of the drafters of those application profiles or standards and does not reflect actual use. Nonetheless, those selected for comparison appear to be those that are either currently active or, for instance in the case of UK LOM, were particularly influential application profiles that often served as templates for other application profiles.

3.2 Ranking the LOM Elements

The raw recommendations are reflected in Appendix A. In an attempt to summarize these recommendations, a ranking of the LOM elements was produced by giving an element five points for each application profile that made its use mandatory, four points for highly desirable, three points for desirable, one point for optional, no points for those elements not discussed or not included in an application profile, and minus three points when an application profile recommended an element not be used.

Based on the preferences of the various application profiles reviewed, the following elements stand out as the ones most often made mandatory or recommended.

Rank	LOM Element	General Category & Sub-element	Definition
1	1.1.1	**General.**Catalog	The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.
2	1.1.2	**General.**Entry	The value of the identifier within the identification or cataloging scheme that designates or identifies this learning object.
3	1.2	**General.**Title	Name given to this learning object.
4	6.2	**Rights.**Copyright & Other Restrictions	Whether copyright or other restrictions apply to the use of this learning object.
5	1.3	**General.**Language	The primary human language or languages used within this learning object to communicate to the intended user.
6	1.4	**General.**Description	A textual description of the content of this learning object.
7	6.3	**Rights.**Description	Comments on the conditions of use of this learning object.
8	2.3.1	**Lifecycle.**Role	Kind of contribution. Minimally, the Author(s) of the learning object should be described.
9	2.3.2	**Lifecycle.**Entity	The identification of and information about entities (i.e., people, organizations) contributing to this learning object. The entities shall be ordered as most relevant first.
10	3.3	**Metadata.**Metadata Schema	The name and version of the authoritative specification used to create this metadata instance.
11	2.3	**Lifecycle.**Contribute	Those entities (people, organizations) that have contributed to the state of this learning object during its life cycle (e.g., creation, edits, publication).
12	4.3	**Technical.**Location	A string that is used to access this learning object. It may be a location (e.g., URL), or a method that resolves to a location (e.g., URI).
13	9.2.1	**Classification.**Source	The name of the classification system.
14	1.1	**General.**Identifier	A globally unique label that identifies this learning object.
15	9.2.2.1	**Classification.**Id	The identifier of the taxon, such as a number or letter combination provided by the source of the taxonomy.
16	9.2.2.2	**Classification.**Entry	The textual label of the taxon.
17	5.2	**Educational.**Learning Resource Type	Specific kind of learning object. The most dominant kind shall be first.
18	6.1	**Rights.**Cost	Whether use of this learning object requires payment.
19	9.1	**Classification.**Purpose	The purpose of classifying this learning object.
20	1.5	**General.**Keyword	A keyword or phrase describing the topic of this learning object.
21	2.1	**Lifecycle.**Version	The edition of this learning object.
22	5.6	**Educational**.Context	The principal environment within which the learning and use of this learning object is intended to take place.
23	3.1.1	**Metadata.**Catalog	The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.
24	3.1.2	**Metadata.**Entry	The value of the identifier within the identification or cataloging scheme that designates or identifies this metadata record.
25	9.2.2	**Classification.**Taxon	A particular term within a taxonomy. A taxon is a node that has a defined label or term. A taxon may also have an alphanumeric designation or identifier for standardized reference. Either or both the label and the entry may be used to designate a particular taxon.

4. How are Learning Resources actually being published “in the wild”?

4.1 Surveying Repositories

It is often difficult to determine what metadata standards a repository actually supports. Often repositories do not directly expose the metadata standards in use, and one can merely deduce standards that are likely in use from the search facets provided or from individual detailed records. An automated means of surveying a large number of repositories to discover metadata standards was sought and pursued using the OAI-PMH protocol. This approach necessarily excludes those repositories not implementing OAI-PMH and therefore the results cannot be interpreted to have full generality, but at best can provide data about what metadata standards are supported by those repositories supporting OAI-PMH. Furthermore, there is no definitive list of all repositories of learning resources or even of all repositories implementing OAI-PMH, so some selection bias may also be present.

From a list of over 1,000 repositories, most of which were listed in openDOAR,[9] each repository that supported OAI-PMH was queried and requested to list the metadata formats that it supported. Of 1,117 unique repositories queried in August 2011, five responded with a 403 or 500 server error, and 84 were unreachable, leaving 1,028 repositories that responded. However, 348 repositories responded with a null response, not listing any supported metadata formats, leaving 680 responding repositories that listed at least one supported metadata format. Of those 680, 556 or 81.76% reported that they support oai_dc, 205 or 30.15% mets, 204 or 30% rdf, 155 or 22.79% didl, and 96 or 14.12% uketd_dc. See figure 4. A complete list of repositories and responses is provided in Appendices B and C. Given the emphasis the OAI places on providing a mapping to Dublin Core, it is perhaps surprising that *any* of the repositories implementing OAI-PMH do not indicate that they support oai_dc. Others have surveyed OAI-PMH repositories to see which Dublin Core elements are actually used. (Efron, 2007).

[9] The full list of surveyed repositories is available from http://www.delicious.com/openpossible/OAI%3Ayes

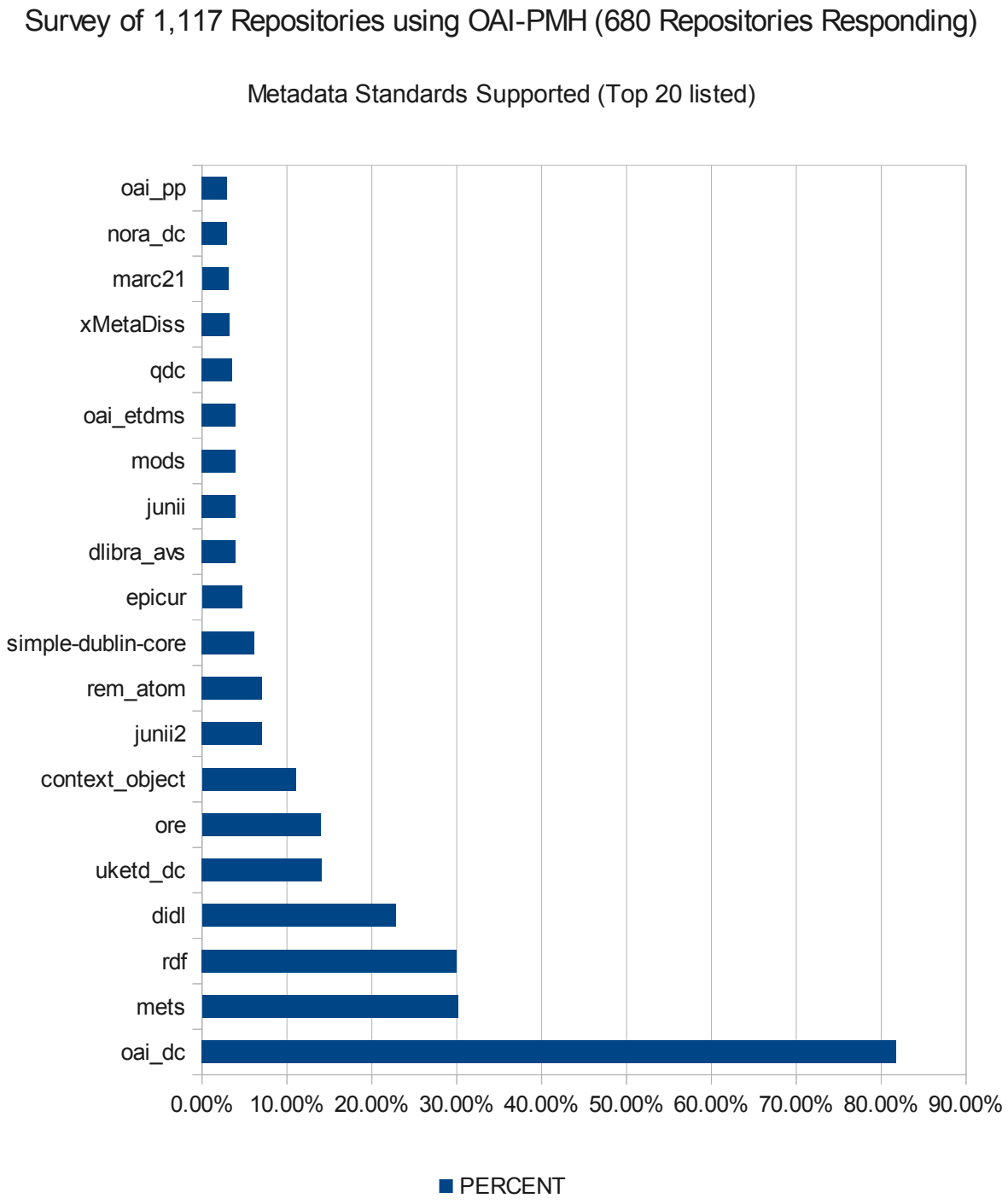


Figure 4. See raw data in Appendices B and C.

Among those repositories surveyed, only two responded that they supported LOM. However, (Barker & Campbell, 2010) cite numerous examples to explain that "LOM has been widely implemented by repositories and other learning resource providers, partly as a result of its status as an international standard, and partly through its association with other influential specifications, such as those produced by the IMS Global Learning Consortium (e.g. Content Packaging, Question and Test Interoperability) and by ADL (SCORM). Examples of repositories and initiatives that have adopted the LOM are the JORUM, a JISC funded repository of teaching and learning materials for UK Further and Higher Education; the European Ariadne foundation; various European SchoolNet projects; the Global Learning Objects Brokered Exchange federation; and many more." (Barker & Campbell, 2010) (internal citations omitted).

4.2 Beyond the Repositories

Learning resources are not only found in repositories, however. Video, slide, or photo-sharing sites and many other types of sites contain learning resources with varying degrees of metadata. Most of these sites do not presently implement a standard metadata format, and in many cases there are not tools for associating such metadata with the learning resource on these sites or what metadata exists is not provided in a machine-readable format. For example, YouTube provides its users who upload videos the ability to associate a Title and Description with their video and to categorize uploaded videos into one of fifteen pre-defined categories. The user may also assign tags of her choosing to the video and may select a Creative Commons Attribution license or the Standard YouTube License for the video. It is also possible to provide a Date and geo-location information for the video. These are several of the chief elements of the leading metadata standards, but it does not appear that any of this metadata is provided in a machine-readable format. The situation is similar at many popular sites that contain both general purpose content as well as learning resources.

5. Metadata Creation and Editing Tools

5.1 Metadata Editing Software

Metadata must either be associated with a learning resource automatically upon its creation or afterward through a manual or software-assisted process. For metadata to be associated with a learning resource in practice, the barriers to associating that metadata with that resource should be as low as possible. A brief survey of metadata creation tools suggests that very little is presently available to lower those barriers. In 2005 CanCore surveyed Learning Object Metadata

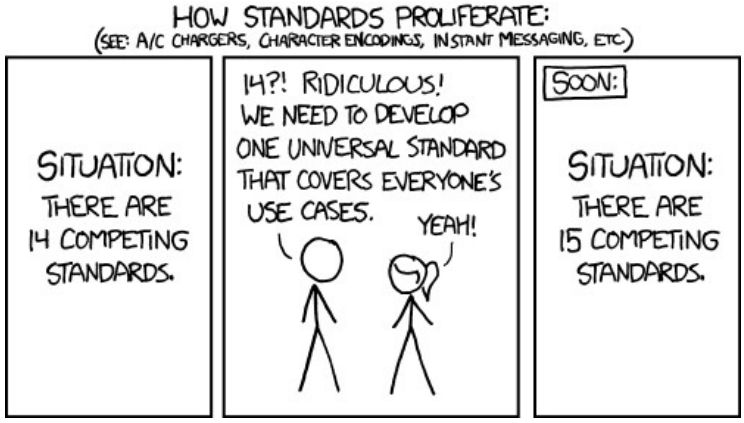
Editors capable of producing IEEE LOM XML (Friesen, 2005) and virtually all of those efforts are now defunct. Indeed, of the ten editors surveyed, only one, Reload v2.0, continues to have a functioning URL. Another editor surveyed in 2005, Lompad, released a revision in late 2010 (at a new URL).[10]

5.2 Platform-integration Tools

Commonly-used platforms on which one might publish learning resources often also lack core functionality or even plugins to enable one to associate standardized metadata with the resource. Many content management systems lack the ability to associate even Simple Dublin Core with content. Other commonly-used platforms, such as Wordpress and MediaWiki, also lack default means of associating standardized metadata with content. There is a plugin that enables Wordpress to associate Simple Dublin Core with content,[11] but one must install it separately, must choose a theme that will actually deliver the created markup, the user must understand all the metadata fields without any documentation or prompting, and the user must enter the metadata in a free-text field. If the user seeks to use a field that should make use of a controlled vocabulary, this is not ideal.

6. Lessons Learned and Recommendations

6.1 Learning from past efforts



Randall Munroe, *Standards*, xkcd, http://xkcd.com/927/ (Jul. 20, 2011). CC BY-NC 2.5.

[10] Technologies Cogigraph Inc (TCI), *Lompad Version 1.0*, revision 51 http://helios.licef.ca:8080/LomPad/en/index.htm (Nov. 23, 2010).

[11] Wordpress.org, *Dublin Core Metadata*, https://wordpress.org/extend/plugins/dublin-core-metadata/ (May 30, 2011).

LRMI should be careful to learn from pre-existing efforts and not to duplicate efforts already underway. To the extent the LRMI working group focuses on extending the structured data markup schema of schema.org for learning resources, it will be doing something new, because schema.org's launch was so recent that no one has yet extended the schema specifically for learning resources. However, if the LRMI working group were to determine that an existing metadata standard for learning resources should simply be translated for use by schema.org, then the LRMI working group should address the question of why those that originated that metadata standard ought not be the ones to provide a microdata/schema.org implementation of it.

6.2 The Complexity of Metadata Standards for Learning Resources are a Barrier to Adoption

Metadata standards for learning resources are complex, often in an attempt to capture in advance the variety of content and the diversity of users and use cases that are anticipated. Unless software tools make the association of metadata with content simple, adoption will suffer. Simple Dublin Core, consisting of just 15 elements, has had the most significant adoption and support. Any proposed LRMI vocabulary should seek to minimize complexity and reuse pre-existing well-understood and well-supported elements, wherever possible.

6.3 The Lack of Software Tools For Associating Metadata With Learning Resources is a Barrier to Adoption

Currently, even those who might wish to associate standards-based metadata with their learning resources will find little support from either standalone or platform-integrated tools. Since schema.org utilizes microdata,[12] and since there is a mapping to RDFa,[13] it may be that general-purpose tools that support the writing of microdata will be useful. Several such tools already exist,[14] but in many cases could be improved to lower barriers for novice end users wishing to associate metadata with learning resources. One could identify the most commonly-used platforms that host learning resources and then ensure that there is a simple means of associating any proposed LRMI vocabulary with content on those platforms, and if not, one could work to develop such tools. Otherwise adoption will suffer.

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[12] Schema.org, *Getting started with schema.org*, http://schema.org/docs/gs.html (Jun. 29, 2011)

[13] Schema.org, *Data Model*, http://schema.org/docs/datamodel.html (Jun. 29, 2011).

[14] Schema.rdfs.org, *What tools are available?*, http://schema.rdfs.org/tools.html (Sep. 1, 2011).

6.4 Domain-specific Users Have Expertise Regarding Their Needs That Cannot Be Anticipated

The schema.org site states, "The type hierarchy presented on this site is not intended to be a 'global ontology' of the world. It only covers the types of entities for which we (Microsoft, Yahoo! and Google), think we can provide some special treatment for, through our search engine, in the near future."[15] However, a review of the schema.org Type Hierarchy[16] makes it difficult to conclude that it is not an ontology, though perhaps partial, and as individuals and groups, such as LRMI, seek to extend it, then it will become increasingly more "global." The complexity of learning resource metadata standards, described above, is but the tip of a large iceberg of complexity that awaits. Learning resource metadata standards sought only to cover a single (sprawling) domain in advance, but schema.org's type hierarchy, if expanded, truly could have "global" coverage. Such an approach is fraught with difficulties. If instead, users within a specific domain were given the freedom to choose the markup scheme that suits their unique needs, relying on their domain-specific expertise, and if search engines nonetheless had a means of accepting and utilizing such markup, conflicts over a single hierarchy to govern everything could be avoided. This is not necessarily something that LRMI can itself resolve, but it should be cognizant of the fact that it may be contributing to a system that ultimately may need to be fundamentally reorganized.

6.5 Metadata Standards Efforts Need Plans for Long-term Maintenance

The number of IEEE LOM application profiles and associated web pages that are no longer available online or available only through the Internet Archive's Wayback Machine is astonishing. There are countless projects associated with this field that no longer have a functioning website and apparently made no provisions to archive their work for the benefit of future researchers. LRMI should think carefully early about how to preserve its work over the long term and how to maintain any vocabulary that may be developed.

7. Conclusion

The efficient discovery and management of learning resources remains an important problem. Metadata standards efforts have sought to address these issues and both their common conclusions and failures can inform the work of LRMI as it seeks to make use of metadata

[15] Schema.org, *Data Model*, http://schema.org/docs/datamodel.html (Jun. 29, 2011).

[16] Schema.org, *The Type Hierarchy*, http://schema.org/docs/full.html (n.d.).

vocabularies through schema.org as a new avenue of addressing these daunting problems. If LRMI learns from past efforts, understands the barriers to adoption, and makes a plan for future maintenance it should be able to make significant progress.

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Appendix A

M	'Mandatory' means that a value must be supplied.
HD	'Highly Desirable'
D	'Desirable' = 'Recommended' means that a value should be supplied unless there is a valid reason not to.
O	'Optional' means that a value may be supplied if desired. (In the case of Dublin Core, it means that an equivalent or roughly equivalent DC mapping exists.)
x	Not mentioned in application profile description.
NR	'NOT Recommended'. "Do not use this element; it may cause interoperability issues."

This chart presents a comparison of several IEEE LOM application profiles (and a Dublin Core mapping to same) to illustrate which LOM elements are most often described as "Mandatory", "Highly Desirable", "Desirable", "Optional" or "Not Recommended" by the developers of the profiles.

LOM	LOM	CanCore	UK LOM Core	RDN/LTSN	VetaData	ANZ-LOM	NORLOM	LOREIom	NL-LOM	European Schoolnet (LRE)	Dublin Core (dcterms)	MIT OCW
1	General	O	M	M	container	x	M	M	M	M	x	x
1.1	Identifier	O	M	M	container	x	M	M	M	O	x	M
1.1.1	Catalog	O	M	M	M	M	M	M	M	M	x	M
1.1.2	Entry	O	M	M	M	M	M	M	M	M	x	M
1.2	Title	O	M	M	M	M	M	M	M	D	title	M
1.3	Language	O	M	M	D	M	M	D	M	M	language	D
1.4	Description	O	M	M	M	M	M	D	D	D	description	M
1.5	Keyword	O	D	D	M	M	D	D	D	D	x	x
1.6	Coverage	x	O	O	O	NR	O	x	O	O	coverage	x
1.7	Structure	x	O	x	O	NR	O	x	O	O	x	x
1.8	Aggregation Level	O	O	x	D	M	O	x	Business Rule	O	x	D
2	Life Cycle	O	M	M	container	x	D	D	D	D	x	x
2.1	Version	O	D	x	D	M	D	D	D	O	x	M
2.2	Status	x	O	x	D	M	O	D	D	O	x	M
2.3	Contribute	O	M	M	container	M	D	D	D	D	x	M
2.3.1	Role	O	M	D	HD	M	D	D	D	M	x	M
2.3.2	Entity	O	M	D	HD	M	D	D	D	D	x	M
2.3.3	Date	O	M	x	HD	O	D	D	D	O	date	O

Appendix A

LOM	LOM	CanCore	UK LOM Core	RDN/LTSN	VetaData	ANZ-LOM	NORLOM	LORElom	NL-LOM	European Schoolnet (LRE)	Dublin Core (dcterms)	MIT OCW
3	Meta-Metadata	O	M	D	container	M	M	x	M	O	x	x
3.1	Identifier	O	M	O	O	x	M	x	O	O	x	x
3.1.1	Catalog	O	M	O	O	M	M	x	O	M	x	x
3.1.2	Entry	O	M	O	O	M	M	x	O	M	x	x
3.2	Contribute	O	M	O	O	O	M	x	D	O	x	x
3.2.1	Role	O	M	O	O	O	M	x	D	D	x	D
3.2.2	Entity	O	M	O	O	O	M	x	D	D	x	D
3.2.3	Date	O	M	O	O	O	D	x	D	O	date	x
3.3	Metadata Scheme	O	M	D	HD	M	M	M	M	O	x	x
3.4	Language	O	M	O	container	M	M	x	O	O	x	x
4	Technical	O	M	D	O	x	M	M	D	NR	x	x
4.1	Format	O	D	D	D	M	D	D	D	NR	format	x
4.2	Size	O	D	O	O	M	D	x	O	NR	extent	x
4.3	Location	O	M	M	HD	M	M	M	Business Rule	NR	x	M
4.4	Requirement	x	O	x	O	x	O	x	O	NR	x	x
4.4.1	OrComposite	x	O	x	O	D	O	x	O	NR	x	D
4.4.1.1	Type	x	O	x	O	D	O	x	O	NR	x	D
4.4.1.2	Name	x	O	x	O	D	O	x	O	NR	x	D
4.4.1.3	Minimum Version	x	O	x	O	D	O	x	O	NR	x	D
4.4.1.4	Maximum Version	x	O	x	O	O	O	x	O	NR	x	D
4.5	Installation Remarks	x	O	x	O	O	O	x	O	NR	x	x
4.6	Other Platform Requirements	O	O	O	O	D	O	x	O	NR	x	x
4.7	Duration	O	O	x	O	O	O	x	O	NR	extent	x

Appendix A

LOM	LOM	CanCore	UK LOM Core	RDN/LTSN	VetaData	ANZ-LOM	NORLOM	LORElom	NL-LOM	European Schoolnet (LRE)	Dublin Core (dcterms)	MIT OCW
5	Educational	O	D	D	container	x	D	D	M	M	x	x
5.1	Interactivity Type	x	D	x	O	NR	O	x	O	O	x	x
5.2	Learning Resource Type	O	D	D	HD	M	D	D	D	M	x	x
5.3	Interactivity Level	O	D	x	O	NR	O	x	O	O	x	x
5.4	Semantic Density	x	D	x	O	NR	O	x	O	O	x	x
5.5	Intended End-User Role	O	D	x	O	D	D	x	M	D	audience	x
5.6	Context	O	D	O	HD	D	D	D	Business Rule	D	x	M
5.7	Typical Age Range	O	D	x	O	D	O	x	M	D	x	x
5.8	Difficulty	x	D	x	O	NR	O	x	O	O	x	x
5.9	Typical Learning Time	O	NR	x	O	NR	O	x	D	O	x	x
5.10.	Description	x	D	O	O	O	O	x	O	O	x	x
5.11	Language	O	D	x	O	NR	O	x	O	O	Linguistic System	x
6	Rights	O	M	M	container	x	M	M	M	M	x	x
6.1	Cost	O	D	x	D	M	D	M	M	M	x	x
6.2	Copyright & Other Restrictions	O	M	M	D	M	M	M	M	M	x	M
6.3	Description	O	M	D	HD	M	M (conditional)	D	Business Rule	M	rights	M

Appendix A

LOM	LOM	CanCore	UK LOM Core	RDN/LTSN	VetaData	ANZ-LOM	NORLOM	LORElom	NL-LOM	European Schoolnet (LRE)	Dublin Core (dcterms)	MIT OCW
7	Relation	O	O	O	O	D	O	D	D	O	relation	x
7.1	Kind	O	O	O	O	D	O	x	D	O	x	x
7.2	Resource	O	O	O	O	x	O	D	D	O	x	x
7.2.1	Identifier	O	O	x	O	x	O	D	D	O	x	x
7.2.1.1	Catalog	O	O	x	O	D	O	D	D	O	x	x
7.2.1.2	Entry	O	O	x	O	D	O	D	D	O	x	x
7.2.2	Description	x	O	x	O	O	O	x	O	O	x	x
8	Annotation	O	O	O	O	x	O	x	O	O	x	x
8.1	Entity	O	D	x	O	O	O	x	O	O	x	D
8.2	Date	O	D	x	O	O	O	x	O	O	created	D
8.3	Description	O	D	O	O	O	O	x	O	O	description	D
9	Classification	O	D	D	container	x	D	D	Business Rule	D	x	x
9.1	Purpose	O	D	D	HD	M	D	D	(M)	D	x	x
9.2	Taxon Path	O	D	D	container	x	D	D	Business Rule	D	x	x
9.2.1	Source	O	D	D	HD	M	D	D	(M)	D	x	D
9.2.2	Taxon	O	D	D	container	x	D	D	(M)	D	x	D
9.2.2.1	ID	O	D	D	HD	D	D	D	(M)	D	identifier	D
9.2.2.2	Entry	O	D	D	HD	M	D	D	(M)	O	x	D
9.3	Description	x	O	x	D	O	D	x	O	NR	description	x
9.4	Keyword	O	O	x	D	NR	O	x	O	NR	x	M

Appendix B

Metadata Standard	Times Appeared	Percentage
oai_dc	556	81.76%
mets	205	30.15%
rdf	204	30.00%
didl	155	22.79%
uketd_dc	96	14.12%
ore	95	13.97%
context_object	75	11.03%
junii2	48	7.06%
rem_atom	48	7.06%
simple-dublin-core	42	6.18%
epicur	32	4.71%
dlibra_avs	27	3.97%
junii	27	3.97%
mods	27	3.97%
oai_etdms	27	3.97%
qdc	24	3.53%
xMetaDiss	22	3.24%
marc21	21	3.09%
nora_dc	20	2.94%
oai_pp	20	2.94%
swepub_mods	14	2.06%
ese	8	1.18%
oai_marc	8	1.18%
xMetaDissPlus	8	1.18%
oai_qdc	7	1.03%
marc	6	0.88%
nl_didl	6	0.88%
arno	5	0.74%
marcxml	5	0.74%
neeo	5	0.74%
almadl	4	0.59%
nsdl_dc	4	0.59%
oai_rfc1807	4	0.59%
rian_dc	4	0.59%
amf	3	0.44%
dare_didl	3	0.44%
oai_wgl	3	0.44%
sp_dc	3	0.44%
uketd_mets	3	0.44%
ddf-mxd	2	0.29%
dim	2	0.29%
lom	2	0.29%
neeo_didl	2	0.29%
nereus	2	0.29%

Metadata Standard	Times Appeared	Percentage
oai_ems	2	0.29%
oai_xmetadiss	2	0.29%
okayama	2	0.29%
socionet	2	0.29%
swepub	2	0.29%
uppsok	2	0.29%
XMetaDissPlus	2	0.29%
adn	1	0.15%
agris	1	0.15%
all_dc	1	0.15%
arXiv	1	0.15%
arXivOld	1	0.15%
briefmeta	1	0.15%
collexis	1	0.15%
comm_anno	1	0.15%
dare_dc	1	0.15%
deptalv1	1	0.15%
didl_test	1	0.15%
dif	1	0.15%
dited	1	0.15%
dlese_anno	1	0.15%
dlese_collect	1	0.15%
do	1	0.15%
dsrrs	1	0.15%
eap	1	0.15%
eseeulocal	1	0.15%
exl_dc	1	0.15%
gsdl_qdc	1	0.15%
http_header	1	0.15%
ims1_2_1	1	0.15%
imsmd	1	0.15%
iso19139	1	0.15%
miless	1	0.15%
MODS	1	0.15%
mtd-br	1	0.15%
NEEOdidl-mods	1	0.15%
nereus_qdc	1	0.15%
news_opps	1	0.15%
nl_didl_test	1	0.15%
nl_mods	1	0.15%
nl_ore	1	0.15%
oai_adt	1	0.15%
oai_akaber	1	0.15%
oai_datacite_dc	1	0.15%

Appendix B

Metadata Standard	Times Appeared	Percentage
oai_dc_dauphine	1	0.15%
oai_dc_filtered	1	0.15%
oai_dc_q	1	0.15%
oai_dc_unibo	1	0.15%
oai_didl	1	0.15%
oai_hal	1	0.15%
oai_inria	1	0.15%
oai_lockss	1	0.15%
oai_lom	1	0.15%
oai_score	1	0.15%
oai_xmetadissplus_kurz	1	0.15%
oclc_dc	1	0.15%
olac	1	0.15%
pa	1	0.15%
paj_dc	1	0.15%
pan_md	1	0.15%
persee_erudit	1	0.15%
persee_mets	1	0.15%
pmb_xml_unimarc	1	0.15%
pmc	1	0.15%
primo	1	0.15%
raw_marc21	1	0.15%
rif	1	0.15%
rss_dc	1	0.15%
tel	1	0.15%
tel_ap	1	0.15%
test	1	0.15%
ubu_mods	1	0.15%
xmetadiss	1	0.15%
xmetadissplus	1	0.15%
zim_export	1	0.15%

Of 1,117 unique repositories queried in August 2011, 680 responding repositories listed at least one supported metadata format. This chart indicates how many times each metadata standard was reported. The metadata standards are reported according to the OAI-PMH conventions.

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Aberdeen University Research Archive	['mets', 'rdf']
Academic Research Repository at the Institute of Developing Economies	['oai_dc', 'junii']
Access to Research Resources for Teachers	['uketd_dc']
Adelaide Research	['oai_dc', 'rdf']
ALADIN Research Commons	['oai_dc', 'qdc']
Alexandria Research Platform	['oai_dc']
Almae Matris Studiorum Acta	['almadl', 'context_object', 'didl', 'mets', 'oai_dc']
Almae Matris Studiorum Campus	['oai_dc', 'almadl', 'uketd_dc', 'oai_dc_unibo', 'didl', 'mets']
ALT Open Access Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
AMS Tesi di Dottorato	['almadl', 'didl', 'mets', 'oai_dc']
AMS Tesi di Laurea	['almadl', 'context_object', 'didl', 'mets', 'oai_dc']
Amsterdam University Press Publications	['oai_dc', 'arno']
Analytical Sciences Digital Library	['oai_dc']
Anglia Ruskin Research Online	['uketd_dc']
Aomori University of Heatlh and Welfare Repository A-plus	['junii', 'junii2']
Aquatic Commons	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Archipel - Université du Québec à Montréal	['oai_dc', 'uketd_dc', 'didl', 'mets', 'oai_etdms']
Archive of European Integration	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Archive of the Institute of Business Economics (Vállalatgazdaságtan Intézet Archivuma)	['oai_dc', 'uketd_dc', 'didl', 'mets']
Archive Ouverte en Sciences de l'Information et de la Communication	['oai_dc']
Archivio Aperto di Ateneo	['oai_dc']
Archivio Istituzionale	['oai_dc']
Archivio Istituzionale della Ricerca	['oai_dc', 'ore']
Archivio Istituzionale Università di Bergamo	['oai_dc']
Archivo Abierto Institucional de la Universidad Rey Juan Carlos	['oai_dc', 'rdf', 'ore']
Archivo Aperto di Documenti per la Medicina Sociale	['oai_dc']
Archivo Digital UPM	['oai_dc', 'uketd_dc', 'didl', 'mets']
Armenian Foundation Digital Library	['oai_dc', 'dlibra_avs']
ART-Dok	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
ArUMS Digital Repository (سامانه اطلاعات زیست پزشکی و سلامت)	['context_object', 'didl', 'mets', 'oai_dc']
arXiv.org e-Print Archive	['oai_dc', 'arXiv', 'arXivOld']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Asahikawa Medical College Repository	['junii', 'junii2']
Aston University Research Archive	['oai_dc', 'uketd_dc', 'didl', 'mets']
Ball State University Digital Media Repository	['oai_dc']
Bałtycka Biblioteka Cyfrowa	['oai_dc', 'dlibra_avs']
Base de publications de l'université Paris-Dauphine	['oai_dc', 'neeo', 'oai_dc_dauphine', 'rdf', 'mets']
bepress Legal Repository	['oai_dc', 'simple-dublin-core']
Bergen Open Research Archive - UiB	['oai_dc', 'rdf', 'ore']
Berkeley Electronic Press	['oai_dc', 'simple-dublin-core']
BI Brage	['nora_dc']
Biblioteca Digital - Universidad Icesi	['oai_dc', 'rdf', 'ore']
Biblioteca Digital da UNICAMP	['oai_dc', 'mtd-br']
Biblioteca Digital de les Illes Balears	['gsdl_qdc']
Biblioteca Digital de Monografias	['oai_dc', 'rdf']
Biblioteca Digital do IPB	['oai_dc', 'rdf', 'ore']
Biblioteca Digital Icaro	['oai_dc', 'rdf']
Biblioteca Digital IEP-PETROECUADOR	['oai_dc', 'rdf', 'ore']
Biblioteca Digital Jurídica do Superior Tribunal de Justiça	['oai_dc', 'rdf']
Biblioteca Valenciana Digital	['oai_dc', 'oai_marc', 'ese', 'marc21']
Biblioteka Cyfrowa KLF UW 9Digital Library of the Formal Linguistics Department at the University of Warsaw)	['oai_dc', 'uketd_dc', 'didl', 'mets']
Biblioteka Cyfrowa Uniwersytetu Wrocławskiego (Digital Library of Wroclaw University)	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Biblioteki Cyfrowej Politechniki Warszawskiej	['oai_dc', 'dlibra_avs']
Bibliothèque numérique de l'enssib	['oai_dc']
Bibliothèque Numérique RERO DOC	['oai_dc', 'marcxml']
BICTEL/e - ULg	['oai_dc', 'oai_marc', 'oai_rfc1807']
Biens Culturels Africains	['oai_dc', 'rdf']
BiPrints	['oai_dc']
Birkbeck ePrints	['oai_dc', 'uketd_dc', 'didl', 'mets']
Blix Open Research Archive	['nora_dc']
BOA Bicocca Open Archive	['mets', 'didl', 'rdf']
Boise State University - ScholarWorks	['oai_dc', 'simple-dublin-core']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Boloka: Research Repository North-West University	['oai_dc', 'rdf', 'ore']
Borås Academic Digital Archive	['oai_dc', 'uppsok', 'swepub', 'qdc', 'mods']
Bournemouth University Research Online	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Bowling Green State University Digital Resource Commons	['oai_dc', 'rdf', 'ore']
Bradford Scholars	['uketd_dc', 'oai_dc', 'rdf', 'ore']
Brage BDH	['nora_dc']
Brage HDH	['nora_dc']
Brage Hihm	['nora_dc']
Brage HiM	['nora_dc']
Brage HiNe	['nora_dc']
Brandeis University Digital Collections	['mets', 'rdf']
Brock University Digital Repository	['oai_dc', 'rdf', 'ore', 'mets']
Brunel University Research Archive	['oai_dc', 'rdf', 'ore']
California State Univeristy Channel Islands Institutional Repository	['oai_dc', 'rdf', 'ore']
Caltech Authors	['oai_dc', 'uketd_dc', 'didl', 'mets']
Caltech Theses and Dissertations	['oai_dc', 'uketd_dc', 'didl', 'mets']
Canterbury Research and Theses Environment	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Carnegie Mellon Research Showcase	['oai_dc', 'simple-dublin-core']
Catalysis Database	['oai_dc', 'uketd_dc', 'didl', 'mets']
CEDA Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
Celebration of Women Writers	['oai_dc']
Center for Jewish History Digital Collections	['marc21', 'mets']
Central and Eastern European Marine Repository	['oai_dc', 'qdc', 'mods', 'mets']
Central Archive at the University of Reading	['oai_dc', 'uketd_dc', 'didl', 'mets']
Central Economics and Mathematics Institute RAS	['amf', 'oai_dc', 'socionet']
CERN Document Server	['oai_dc']
ChesterRep	['uketd_dc']
Chiba University's Repository for Access To Outcomes from Research	['oai_dc', 'junii']
citaREA Repositorio Electrónico Agroalimentario	['mods', 'mets', 'rdf']
Claremont Colleges Digital Library	['oai_dc']
CoastWeb Library	['oai_dc', 'uketd_dc', 'didl', 'mets']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Cognitive Sciences ePrint Archive	['didl', 'mets', 'oai_dc', 'oai_dc', 'rdf']
Colorado State University Libraries Digital Repository	['marc21', 'mets', 'primo', 'oai_dc']
Community Repository of Fukui	['oai_dc']
Concordia University Research Repository	['context_object', 'didl', 'mets', 'oai_dc', 'oai_etdms']
Connexions	['oai_dc', 'ims1_2_1']
Consortium for the Advancement of Undergraduate Statistics Education	['oai_dc', 'nsdl_dc']
Corvinus Research Archive	['oai_dc', 'uketd_dc', 'mods', 'mets', 'didl', 'neeo']
Corvinus University of Budapest	['oai_dc', 'uketd_dc', 'didl', 'mets']
Cranfield CERES	['mets', 'uketd_dc', 'didl', 'rdf']
Cronfa at Swansea University	['uketd_dc', 'oai_dc', 'uketd_mets', 'rdf']
CSIR Research Space	['oai_dc', 'rdf', 'ore']
CURVE/open	['oai_dc', 'oai_lom', 'oai_score']
Cybertesis Pontificia Universidad Católica de Valparaíso	['oai_etdms']
Cybertesis USMP	['oai_etdms']
Dagstuhl Research Online Publication Server	['oai_dc']
Dalarna University College Electronic Archive	['oai_dc']
DCU Online Research Access Service	['oai_dc', 'uketd_dc', 'rian_dc', 'didl', 'mets']
De Montfort University Open Research Archive	['uketd_dc', 'oai_dc', 'rdf', 'ore']
Deakin Research Online	['oai_dc', 'pa']
Deep Blue at the University of Michigan	['oai_dc', 'rss_dc', 'qdc']
deposit::hagen	['oai_dc', 'uketd_dc', 'didl', 'mets']
Depósito de Dissertações e Teses Digitais	['mets', 'deptalv1', 'marc', 'tel', 'dited']
Dépôt de documents et de données de Érudit	['oai_dc', 'rdf']
Dépôt Institutionnel de l'Académie universitaire 'Louvain'	['marcxml', 'oai_dc']
Dépôt Institutionnel Numérique	['oai_dc', 'qdc', 'marc21']
Desarrolla, Aprende y Reutiliz	['dim', 'oai_dc', 'qdc', 'rdf', 'ore', 'mods', 'mets']
DESY Publication Database	['marc21', 'raw_marc21']
DHanken	['mets', 'rdf']
Diakonhjemmet Open Research Archive	['nora_dc']
Digitaal Archief UM publicaties	['test', 'neeo_didl', 'dare_didl', 'oai_dc', 'arno', 'nereus', 'nl_didl']
Digital Archives of Colorado College	['oai_dc']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Digital Commons @ Butler University	['oai_dc', 'simple-dublin-core']
Digital Commons @ Illinois Wesleyan University	['oai_dc', 'simple-dublin-core']
Digital Commons @ Ryerson	['oai_dc', 'simple-dublin-core']
Digital Education Resource Archive	['oai_dc', 'uketd_dc', 'didl', 'mets']
Digital Library for Earth System Education	['briefmeta', 'comm_anno', 'news_opps', 'nsdl_dc', 'dlese_collect', 'adn', 'dlese_anno']
Digital Library of Book Studies	['oai_dc', 'dlibra_avs']
Digital Library of Chelm	['oai_dc', 'dlibra_avs']
Digital Library of Modern Greek Studies	['ese']
Digital Library of PAS Institutes	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Digital Library of The KARTA Center Foundation	['oai_dc', 'dlibra_avs']
Digital Library of the University of Pardubice	['oai_dc', 'rdf', 'ore']
Digital Library of Wielkopolska	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Digital Library of Zielona Góra	['oai_dc', 'dlibra_avs']
Digital Library University of Lodz	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Digital Repository at Nanyang Technological University	['oai_dc', 'rdf', 'ore']
Digital Repository in Fetal Medicine	['oai_dc', 'rdf']
Digital repository of Cochin University of Science	['oai_dc', 'rdf', 'ore']
Digital Repository Polonica	['oai_dc', 'dlibra_avs']
Digitala Vetenskapliga Arkivet - Academic Archive On-line	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
DigitalCommons@Bryant University	['oai_dc', 'simple-dublin-core']
DigitalCommons@C.O.D.	['oai_dc', 'simple-dublin-core']
DigitalCommons@CalPoly	['oai_dc', 'simple-dublin-core']
DigitalCommons@Connecticut College	['oai_dc', 'simple-dublin-core']
DigitalCommons@Fayetteville State University	['oai_dc', 'simple-dublin-core']
DigitalCommons@Florida International University	['oai_dc', 'simple-dublin-core']
DigitalCommons@ILR	['oai_dc', 'simple-dublin-core']
DigitalCommons@Linfield	['oai_dc', 'simple-dublin-core']
DigitalCommons@Macalester College	['oai_dc', 'simple-dublin-core']
DigitalCommons@Pace	['oai_dc', 'simple-dublin-core']
DigitalCommons@Providence	['oai_dc', 'simple-dublin-core']
DigitalCommons@Robert W. Woodruff Library	['oai_dc', 'simple-dublin-core']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
DigitalCommons@University of Georgia School of Law	['oai_dc', 'simple-dublin-core']
DigitalCommons@University of Nebraska	['oai_dc', 'simple-dublin-core']
DigitalCommons@USU	['oai_dc', 'simple-dublin-core']
DigitalCommons@UTEP	['oai_dc', 'simple-dublin-core']
Digitale Bibliothek Thüringen	['oai_dc', 'xMetaDissPlus']
Digitale Hochschulschriften der LMU	['epicur', 'oai_dc', 'xMetaDissPlus']
Digitales Archiv - Technische Universität Berlin	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Digitalni arhiv Filozofskog fakulteta u Zagrebu	['context_object', 'didl', 'mets', 'oai_dc']
Dipòsit Digital de Documents de la UAB	['oai_dc']
Diposit Digital de la Universitat de Barcelona	['mets', 'ore', 'rdf']
dLibra Digital Library	['oai_dc', 'dlibra_avs']
DLynx - Rhodes College Archives Digital Collection	['oai_dc', 'rdf', 'ore']
DOCS@RWU	['oai_dc', 'simple-dublin-core']
Doctoral Theses Archive	['oai_dc', 'mets']
Document Server@UHasselt	['oai_dc', 'qdc']
Documentacion cientifica de la ULPGC en abierto	['oai_dc', 'qdc', 'rdf']
Dokumenten-Publikationsserver der Humboldt-Universität zu Berlin	['oai_dc', 'oai_ems', 'oai_pp', 'oai_xmetadiss', 'xMetaDissPlus', 'oai_xmetadissplus_kurz']
Dokumentenserver des LBI-HTA	['oai_dc', 'uketd_dc', 'didl', 'mets']
Dominikańska Biblioteka Cyfrowa	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Doshisha Women's College of Liberal Arts, Academic Repository	['junii', 'junii2']
DRC - University of Toledo	['oai_dc', 'rdf', 'ore']
DSpace @ Cambridge	['uketd_dc', 'oai_dc']
DSpace a Parma	['oai_dc']
DSpace an der Universität Kassel	['oai_dc', 'rdf', 'ore']
DSpace at NIFS	['oai_dc']
DSpace at Open Universiteit Nederland	['mets', 'rdf']
DSpace at Rice University	['oai_dc', 'rdf', 'nsdl_dc']
DSpace at SUNY	['oai_dc', 'rdf', 'ore']
DSpace at The College of William and Mary	['oai_dc', 'rdf']
DSpace at the EUI	['oai_dc', 'rdf', 'ore', 'mets']
DSpace at Tokyo Dental College	['junii2']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
DSpace at UFPR	['oai_dc', 'rdf', 'ore']
DSpace at University of Toyama	['oai_dc']
DSpace at UWIC	['uketd_dc', 'oai_dc', 'uketd_mets', 'mods']
DSpace at Waseda University	['oai_dc', 'junii']
DUGiDocs – Universitat de Girona	['oai_dc', 'rdf']
DUGiMedia – Universitat de Girona	['oai_dc', 'rdf']
Duisburg-Essen Publications Online	['oai_dc', 'xMetaDissPlus']
Durham e-Theses	['oai_dc', 'uketd_dc', 'didl', 'mets']
Durham Research Online	['oai_dc', 'uketd_dc', 'didl', 'mets']
E-Archivo	['oai_dc', 'nereus_qdc']
E-LIB Dokumentserver - Staats und Universitätsbibliothek Bremen	['oai_dc', 'epicur']
E-LIS	['oai_dc', 'ore']
e-Prints Soton	['context_object', 'didl', 'mets', 'oai_dc']
E-Research@Tennessee State University	['oai_dc', 'simple-dublin-core']
e-space at Manchester Metropolitan University	['uketd_dc']
Earth-prints Repository	['oai_dc', 'ore']
eCommons@Cornell	['oai_dc', 'rdf', 'ore']
eCommons@Texas State University	['oai_dc', 'simple-dublin-core']
EconStor	['oai_dc', 'oai_wgl']
eCrystals - Southampton	['oai_dc', 'uketd_dc', 'didl', 'mets']
Edge Hill Research Archive	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
edocUR	['oai_dc', 'rdf']
Education and Research Archive	['oai_etdms']
EEPIS Proceeding	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
EEPIS Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Eidgenössische Technische Hochschule E-Collection	['oai_dc']
Eldorado - Ressourcen aus und für Lehre, Studium und Forschung	['oai_dc', 'xmetadissplus', 'rdf', 'ore', 'xMetaDissPlus']
Electronic archive of Ternopil State Ivan Puluj Technical University	['oai_dc', 'rdf']
Electronic Kyiv-Mohyla Academy Institutional Repository	['oai_dc', 'rdf']
Electronic Research Archive - Blekinge Tekniska Högskola	['oai_dc']
Electronic Sumy State University Institutional Repository	['oai_dc', 'rdf', 'ore']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Electronic Theses and Dissertations at Indian Institute of Science	['mets', 'ore', 'rdf']
Electronic Thesis	['oai_dc']
Electronic Thesis and Dissertation Archive - Università di Pisa	['oai_dc', 'oai_marc', 'oai_rfc1807']
Electronics	['didl', 'mets', 'oai_dc', 'oai_dc', 'rdf']
Elektronisch archivierte Theorie - Sammelpunkt	['context_object', 'didl', 'mets', 'oai_dc']
Elektronische Publikationen der Universität Hohenheim	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Elektronische Publikationen der Universität Mainz	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Elektronisches Volltextarchiv - Scientific Articles Repository	['oai_dc', 'epicur', 'oai_xmetadiss']
ELPUB Digital Repository	['oai_dc']
Engineering and Science Online	['oai_dc', 'uketd_dc', 'didl', 'mets']
Enlighten	['context_object', 'didl', 'mets', 'oai_dc']
Entrepôt OAI-PMH numéro 1 de la Bibliothèque nationale de France : collections numériques	['tel_ap', 'didl']
EPrints Complutense	['oai_dc', 'uketd_dc', 'didl', 'mets', 'MODS']
EPrints Fakultät II	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
ePrints.FRI	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
ePrints@USM	['oai_dc', 'uketd_dc', 'didl', 'mets']
ePublications@Bond University	['oai_dc', 'simple-dublin-core']
ePublications@SCU	['oai_dc', 'simple-dublin-core']
Erasmus University Digital Repository	['oai_dc', 'mods', 'didl', 'dare_didl', 'dare_dc']
ERES Digital Library	['oai_dc']
eResearch@Ozyegin	['oai_dc', 'rdf', 'ore']
eScholarShare at Drake University	['oai_dc', 'rdf']
eScholarship Repository - University of California	['oai_dc', 'oclc_dc']
eScholarship@Amherst	['oai_dc', 'simple-dublin-core']
eScholarship@McGill	['oai_etdms']
eScholarship@UMMS	['oai_dc', 'simple-dublin-core']
Espace ÉTS	['oai_dc']
espace@Curtin	['exl_dc', 'paj_dc', 'oai_dc']
Euskal Doktorego Tesien Bilduma - Repositorio de Tesis Doctorales	['context_object', 'didl', 'mets', 'oai_dc', 'rem_atom']
eVols at University of Hawaii at Manoa	['oai_dc', 'rdf', 'ore']
FAOBIB	['oai_dc']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Flacso Andes DSpace	['oai_dc', 'rdf', 'ore']
Freiburger Dokumentenserver	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Fukushima Medical University Repository	['oai_dc']
Fukushima University Repository (福島大学学術機関リポジトリ)	['junii2']
Georgetown Law Scholarly Commons	['oai_dc', 'simple-dublin-core']
Giessener Elektronische Bibliothek	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Gifu University Institutional Repository	['junii', 'junii2']
Glasgow Theses Service	['uketd_dc']
Global Institutional repository of Nara Medical University	['junii2']
Global Research Archive	['oai_dc', 'uketd_dc', 'didl', 'mets']
Glyndŵr University Research Online	['oai_dc', 'simple-dublin-core']
Goldsmiths Research Online	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Göteborgs universitets publikationer - e-publicering och e-arkiv	['oai_dc', 'lom', 'uppsok', 'swepub', 'qdc', 'rdf', 'mods', 'mets']
Graph Drawing E-print Archive	['context_object', 'didl', 'mets', 'oai_dc']
Greenwich Academic Literature Archive	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Gunadarma University Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
Gunma University Academic Information Repository	['junii2']
HamaMed-Repository	['junii', 'junii2']
Harvard Smithsonian Digital Video Library	['oai_dc']
Hedatuz	['oai_dc', 'uketd_dc', 'ese', 'didl', 'mets']
HELIOS Repository	['oai_dc']
HERMES-IR	['junii2']
HiAk Brage	['nora_dc']
HiBu Brage	['nora_dc']
HiGIA Open Research Archive for Gjøvik University College	['nora_dc']
HiNT Brage	['nora_dc']
HIØ Brage	['nora_dc']
Hirosaki University Repository for Academic Resources	['oai_dc', 'dsrrs']
HKU Scholars Hub	['sp_dc', 'oai_dc', 'junii2', 'rdf', 'ore']
Hochschulschriftenserver - Universität Frankfurt am Main	['oai_dc', 'epicur', 'oai_pp']
Hochschulschriftenserver der Universität Erlangen-Nürnberg	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Hochschulschriftenserver der Universität Stuttgart	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss', 'XMetaDissPlus']
Hochschulschriftenserver der Universität Tübingen	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Hokkaido University Collection of Scholarly and Academic Papers	['oai_dc', 'junii2', 'rdf', 'ore', 'mets']
Hong Kong University of Science and Technology Institutional Repository	['sp_dc']
Horizon / Pleins textes	['oai_dc']
HSF Brage Open Research Archive	['nora_dc']
HSH Brage publication archive	['nora_dc']
HVO Brage	['nora_dc']
Hyokyo Educational and Academic Resources for Teachers	['junii2']
Hyper Article en Ligne	['oai_dc', 'oai_hal', 'oai_inria']
I-Revues	['oai_dc', 'rdf', 'ore']
IAIN Sunan Ampel Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
IBB PAS Repository	['context_object', 'didl', 'mets', 'oai_dc']
Igitur Archief - Utrecht Publishing and Archiving Service	['oai_dc', 'ubu_mods', 'nl_ore', 'ore']
Illinois Digital Environment for Access to Learning and Scholarship Repository	['oai_dc', 'rdf']
Indian Institute of Astrophysics Repository	['oai_dc', 'rdf']
Indiana Historical Society Digital Image Collections	['oai_dc']
Infoscience - École polytechnique fédérale de Lausanne	['oai_dc']
INRIA a CCSD electronic archive server	['oai_dc']
Institute of Education EPrints	['oai_dc', 'uketd_dc', 'didl', 'mets']
Institutional Repository	['marc21']
Institutional Repository of Federal University of Para	['mets', 'ore', 'rdf']
Institutional Repository of Vadym Hetman Kyiv National Economic University	['mets', 'qdc', 'ore', 'rdf']
Institutionelles repOSitorium der Universität Osnabrück	['uketd_dc', 'oai_dc', 'qdc', 'rdf', 'xMetaDissPlus', 'mods', 'mets']
InterNano Nanomanufacturing Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
International Migration, Integration and Social Cohesion online publications	['oai_dc']
Iowa Publications Online	['oai_dc', 'uketd_dc', 'didl', 'mets']
Iowa Research Online	['oai_dc', 'simple-dublin-core']
IPU Repository	['oai_dc', 'okayama', 'uketd_dc', 'junii2', 'didl', 'mets']

Appendix C—680 Responding Repositories

Repository Name	Metadata Standards Supported
Irish Health Repository	['uketd_dc']
ISI Denpasar | Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
ISS Library	['oai_dc', 'uketd_dc', 'didl', 'mets']
Istituto Superiore di Sanità Digital Repository	['oai_dc', 'rdf']
Iwate University Repository	['junii2']
JAIST Repository	['oai_dc']
James Cook University ePrints	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
JAMSTEC Repository	['oai_dc']
JIIA Eprints Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
JISC Information Environment Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
Joetsu University of Education Repository	['oai_dc', 'junii2', 'rdf']
Jorum Open	['oai_dc', 'rdf', 'oai_dc_q']
Josai University Repository of Academia	['oai_dc', 'junii']
JScholarship	['mets', 'rdf']
Jyväskylä University Digital Archive	['oai_dc', 'rdf', 'ore', 'oai_dc_filtered']
Kagoshima University Repository	['junii', 'junii2']
Kanazawa University Repository for Academic Resources	['oai_dc', 'junii2', 'rdf', 'ore']
Kansai University Institutional Repository	['junii', 'junii2']
Kanto Gakuin University IR	['oai_dc']
KATHO Theses	['oai_etdms']
Katholieke Hogeschool Kempen Theses	['oai_etdms']
KCE Repository	['pmb_xml_unimarc', 'oai_dc']
KeiO Academic Resource Archive	['junii', 'junii2']
Kent Academic Repository	['context_object', 'didl', 'mets', 'oai_dc']
KFUPM ePrints	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Khazar University Institutional Repository	['oai_dc', 'rdf']
Kinematic MOdels for Design Digital Library	['oai_dc', 'nsdl_dc']
King Saud University Repository	['oai_dc', 'rdf']
Kingston University Research Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
KIT Academic Repository	['junii2']
KNAW Repository	['nl_didl', 'nl_mods']

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Repository Name	Metadata Standards Supported
Kobe University Repository Kernel	['oai_dc', 'junii']
Kochi University of Technology Academic Resource Repository	['junii2']
Kochi University Repository	['junii2']
Kosmopolis	['oai_dc', 'oai_marc', 'marcxml']
Ktisis	['oai_dc', 'rdf']
Kujawsko-Pomorska Biblioteka Cyfrowa	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Kumamoto University Repository System	['oai_dc', 'junii']
Kwansei Gakuin University Repository	['junii', 'junii2']
Kyoto University Research Information Repository	['oai_dc', 'junii']
Kyushu Institute of Technology of Academic Repository	['junii', 'junii2']
Kyushu University Institutional Repository	['junii', 'junii2']
La Trobe University Research Repository	['marc', 'olac']
Lancaster E-Prints	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Landspítali University Hospital Research Archive	['uketd_dc']
leedsmet open search	['oai_dc', 'imsmd', 'lom']
Leicester Research Archive	['oai_dc', 'rdf', 'ore']
Leodis - A photographic archive of Leeds	['oai_dc']
Librarians' Digital Library	['dim', 'uketd_dc', 'oai_dc', 'qdc', 'rdf', 'ore', 'mods']
Libre Acces aux Rapports Scientifiques et Techniques	['oai_dc', 'rdf', 'ore']
Linnéuniversitetets forskningsdatabas	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
LOUISiana Digital Library Server Respository	['oai_dc']
LSE Research Online	['context_object', 'didl', 'mets', 'mods', 'neeo', 'oai_dc', 'rdf', 'rem_atom']
Lublin University of Technology Digital Library	['oai_dc', 'dlibra_avs']
LUISSearch	['oai_dc', 'uketd_dc', 'didl', 'mets']
Lund University Publications	['oai_dc', 'mods']
Lviv Polytechnic National University Institutional Repository (Електронний науковий архів Науково-технічної бібліотеки Національного університету	['oai_dc', 'rdf']
Macquarie University Research Online	['marc']
Małopolska Biblioteka Cyfrowa (Digital Library of Malopolska)	['oai_dc', 'dlibra_avs']
Mannheim Electronic DOCument Server der Universitätsbibliothek Mannheim	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']

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Repository Name	Metadata Standards Supported
Mason Archival Repository Service	['oai_dc', 'rdf']
Max Planck Society eDoc Server	['oai_dc', 'zim_export']
MediaTUM	['oai_dc', 'epicur', 'xmetadiss', 'xMetaDissPlus']
Medic @ Bibliothèque Numérique	['qdc']
Meiji Repository (Meiji University Academic Repository)	['junii2']
Mémoires et thèses de l'Université Laval	['oai_dc']
Memorial University Newfoundland Digital Archive Initiative	['oai_dc']
MHS Brage	['nora_dc']
Middlesex University Digital Repository	['context_object', 'didl', 'mets', 'oai_dc']
Mie University Scholarly E-collections	['junii2']
Minds @ UNiversity of Wisconsin	['mets', 'rdf']
Minority Health Archive	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Montagne@Doc	['oai_dc']
Morska Biblioteka Cyfrowa (Maritime Digital LIbrary)	['oai_dc', 'dlibra_avs']
MSF Field Research	['uketd_dc']
Multimedia ONline ARchiv CHemnitz	['oai_dc', 'epicur', 'xMetaDiss']
Multimediale Archivserver der CAU und zugleich Digitale Bibliothek	['oai_dc', 'epicur']
Munin - Open Research Archive	['oai_dc', 'rdf', 'ore']
Münstersches Informations und Archivsystem für Multimediale Inhalte	['oai_dc', 'xMetaDissPlus', 'epicur', 'xMetaDiss', 'miless']
Muroran-IT Academic Resource Archive	['oai_dc', 'junii2', 'rdf']
Nagoya Institute of Technology Repository System	['junii', 'junii2']
NAIST Academic Repository	['oai_dc']
Nano Archive	['oai_dc', 'uketd_dc', 'didl', 'mets']
Nara University of Education Academic Repository	['junii', 'junii2']
National Aerospace Laboratories Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rem_atom']
National Digital Library Polona	['oai_dc']
National Engineering Education Delivery System	['oai_dc']
National Institute of Fitness and Sports in Kanoya Repository	['junii', 'junii2']
National Library of Australia Digital Object Repository	['do']
National Museum of Ethnology Repository	['junii2']
Naturalis Publications	['oai_dc', 'arno']

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Repository Name	Metadata Standards Supported
NECTAR	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
NELLCO Legal Scholarship Repository	['oai_dc', 'simple-dublin-core']
Nemertes	['oai_dc']
NERC Open Research Archive	['oai_dc', 'uketd_dc', 'didl', 'mets']
New Bulgarian University Scholar Electronic Repository	['context_object', 'didl', 'mets', 'oai_dc']
Niigata College of Nursing Repository	['junii2']
Niigata University Academic Repository	['junii2']
Norges idrettshøgskoles institusjonelle arkiv	['nora_dc']
Norsk Polarinstitutts elektroniske publikasjonsarkiv Brage	['nora_dc']
Nottingham ePrints	['oai_dc', 'uketd_dc', 'didl', 'mets']
Nottingham eTheses	['oai_dc', 'uketd_dc', 'didl', 'mets']
NRC Publications Archive	['oai_dc']
NUI Maynooth Eprint Archive	['oai_dc', 'uketd_dc', 'rian_dc', 'didl', 'mets']
Numérisation de Documents Anciens Mathématiques	['oai_dc']
Obihiro University of Agriculture and Veterinary Medicine Academic Repository	['oai_dc']
OceanDocs	['agris', 'mods', 'qdc']
OhioLINK Digital Resource Commons	['oai_dc', 'qdc', 'rdf', 'ore']
OhioLINK Electronic Thesis and Dissertation Center	['oai_dc', 'oai_etdms']
Oita University Institutional Repository	['oai_dc']
Okayama University Scientific Achievement Repository	['oai_dc', 'okayama']
Online Publications Store	['context_object', 'didl', 'mets', 'oai_dc']
Online Research @ Cardiff	['context_object', 'didl', 'mets', 'oai_dc', 'uketd_dc']
Online-Publikations-Server der Universität Würzburg	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Open Access Institutional Repository at Robert Gordon University	['uketd_dc', 'oai_dc']
Open Archive dell'Orientale	['oai_dc', 'uketd_dc', 'didl', 'mets']
Open Archive for Conferences held by the Department of Mathematics - Politecnico di Milano	['oai_dc', 'oai_marc', 'marcxml']
Open Archive SIena	['context_object', 'didl', 'mets', 'oai_dc', 'rem_atom']
Open Archive Toulouse Archive Ouverte	['context_object', 'didl', 'mets', 'oai_dc']
Open Archive Università degli Studi di Verona	['oai_dc', 'mods']
Open Digital Archive at Oslo University College	['oai_dc', 'rdf', 'ore']

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Repository Name	Metadata Standards Supported
Open Repositories 2008 Publications	['oai_dc', 'uketd_dc', 'didl', 'mets']
Open Repository and Bibliography	['oai_dc', 'rdf', 'mets']
Open Repository of Keldysh Institute of Applied Mathematics of RAS	['amf', 'oai_dc', 'socionet']
OpenArchive@CBS	['mets', 'rdf']
OpenSIUC	['oai_dc', 'simple-dublin-core']
OpenstarTs	['oai_dc', 'rdf', 'ore', 'mets']
OPUS - Volltextserver Universität Passau	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
OPUS Digitale Hochschulschriften an der FH Düsseldorf	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
ORE Digital Library	['oai_dc']
Osaka City University Repository	['oai_dc', 'junii']
Osaka Kyoiku University Repository	['oai_dc']
Osaka Prefecture University Education and Research Archives	['junii2']
Otago University Research Archive	['oai_dc', 'rdf', 'ore']
OTHES	['oai_dc', 'uketd_dc', 'didl', 'mets']
Padua@research	['oai_dc', 'uketd_dc', 'didl', 'mets']
Padua@thesis	['oai_dc', 'uketd_dc', 'didl', 'mets']
Pandektis	['oai_dc', 'eseeulocal', 'rdf', 'ese']
Pergamos Digital Library	['oai_dc']
Périodiques Scientifiques en Édition Électronique	['oai_dc', 'persee_mets', 'persee_erudit', 'marc', 'mods']
Pharmacy Eprints	['oai_dc', 'uketd_dc', 'didl', 'mets']
PhilSci Archive	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
PolyU Institutional Repository	['sp_dc', 'oai_dc', 'rdf']
Portal de Promoción y Difusión Pública del Conocimiento Académico y Científico	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Portal to Texas History	['oai_dc']
PORTO Publications Open Repository TOrino	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Prometheus-Academic Collections	['junii', 'junii2']
PSU Knowledge Bank	['oai_dc', 'rdf', 'ore']
Publications Et Travaux Académiques de LorrainE	['oai_dc']
Publikasjoner fra Norges teknisk-naturvitenskapelige universitet	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Högskolan i Gävle	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Högskolan i Jönköping	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']

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Repository Name	Metadata Standards Supported
Publikationer från Högskolan i Skövde	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Karlstads Universitet	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från KTH	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Linköpings universitet	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Mälardalens högskola	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Örebro universitet	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Södertörns Högskola	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Umeå universitet	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikationer från Uppsala Universitet	['oai_dc', 'oai_etdms', 'marc21', 'swepub_mods']
Publikations- und Dokumentenserver der Universitätsbibliothek Marburg	['oai_dc', 'epicur', 'oai_pp']
Publikationsserver der Katholischen Universität Eichstätt-Ingolstadt	['oai_dc', 'uketd_dc', 'didl', 'mets']
Publikationsserver der Universität Potsdam	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Publikationsserver des Robert Koch-Instituts	['oai_dc', 'oai_ems']
Publishing Network for Geoscientific and Environmental Data	['oai_dc', 'pan_md', 'dif', 'iso19139']
PubMed Central	['oai_dc', 'pmc']
Qatar University Institutional Repository	['mets', 'rdf']
Qucosa	['oai_dc', 'epicur', 'xMetaDiss']
Queen Margaret University eResearch	['oai_dc', 'uketd_dc', 'didl', 'mets']
Queensland University of Technology ePrints Archive	['oai_dc', 'rdf']
Radboud Repository	['mods', 'dare_didl', 'didl', 'nl_didl']
Recherche uO Research	['oai_dc', 'rdf', 'ore', 'mets']
Regional Materials of Łódź	['oai_dc', 'dlibra_avs']
Repositori d\\\\\\\\'Objectes Digitals per a l\\\\\\\\'Ensenyament la Recerca i la Cultura	['mods', 'mets', 'qdc', 'ese', 'rdf']
Repositori Digital de la UPF	['oai_dc', 'rdf']
Repositori Obert UdL	['oai_dc', 'rdf', 'nl_didl', 'mets']
Repositório Aberto da Universidade Aberta	['oai_dc', 'rdf', 'ore']
Repositório Aberto da Universidade do Porto	['oai_dc', 'rdf', 'ore']
Repositorio Académico de la Universidad de Chile	['oai_dc', 'rdf']
Repositorio CESA	['oai_dc', 'rdf', 'ore']
Repositório Científico do Instituto Nacional de Saúde	['oai_dc', 'rdf', 'ore']
Repositório Científico do Instituto Politécnico de Viseu	['oai_dc', 'rdf', 'ore']

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Repository Name	Metadata Standards Supported
Repositório Comum	['oai_dc', 'rdf', 'ore']
Repositorio da Universidade da Coruña	['oai_dc', 'rdf', 'ore']
Repositório da Universidade dos Açores	['oai_dc', 'rdf', 'ore']
Repositório da Universidade Nova de Lisboa	['mets', 'rdf']
Repositorio de la Facultad de Filosofía y Letras	['oai_dc', 'rdf']
Repositorio de Objetos de Docencia e Investigación de la Universidad de Cádiz	['rdf', 'mets']
Repositorio de trabajos finales del Taller de Diseño Industrial (Cátedra Gálan) de la Carrera de Diseño Industrial	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Repositorio Digital de Tesis de Grado de la Escuela Politécnica Nacional	['oai_dc', 'rdf', 'ore']
Repositorio Digital ESPE	['oai_dc', 'rdf', 'ore']
Repositório do ISPA	['oai_dc', 'rdf', 'ore']
Repositório do LNEG	['oai_dc', 'rdf', 'ore']
Repositorio Hipermedial de la Universidad Nacional de Rosario	['oai_dc', 'rdf', 'ore']
Repositório Institucional da ESEPF	['oai_dc', 'qdc', 'rdf', 'mods']
Repositório Institucional da Universidade Católica Portuguesa	['oai_dc', 'rdf', 'ore']
Repositório Institucional da Universidade de Brasília	['oai_dc', 'rdf']
Repositorio Institucional da Universidade de Santiago de Compostela	['oai_dc', 'rdf', 'ore', 'ese', 'mets']
Repositório Institucional da Universidade Federal do Acre	['mets', 'rdf']
Repositório Institucional da Universidade Federal do Espirito Santo	['oai_dc', 'rdf', 'ore']
Repositório Institucional da Universidade Federal do Rio Grande do Norte	['mets', 'ore', 'rdf']
Repositorio Institucional de Asturias	['mods', 'qdc', 'didl']
Repositorio Institucional de la Universidad de Córdoba	['mets', 'rdf']
Repositório Institucional dos Hospitais da Universidade de Coimbra	['oai_dc', 'rdf', 'ore']
Repositorio Institucional Universidad de Granada	['mets', 'ore', 'ese', 'rdf']
Repositorio Institucional Universidad de Málaga	['oai_dc', 'rdf', 'ese']
Repositorio Tesis Doctorales - Universidad de Burgos	['oai_dc', 'rdf', 'ore']
Repository at Institute of Mathematics and Informatics	['oai_dc', 'rdf']
Repository of the Academy's Library	['context_object', 'didl', 'mets', 'oai_dc']
Repository@Napier	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Repozytorium Eny Politechnika Wrocławska	['oai_dc']
Research Online	['oai_dc', 'simple-dublin-core']

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Repository Name	Metadata Standards Supported
Research Online @ ECU	['oai_dc', 'simple-dublin-core']
Research Papers in Economics	['amf']
research_online@UCD	['rian_dc', 'all_dc', 'NEEOdidl-mods']
Research@ASB	['oai_dc', 'ddf-mxd', 'mods']
Research@StAndrews:FullText	['mets', 'rdf']
ResearchOnline@GCU	['oai_dc', 'simple-dublin-core']
ResearchSpace@Auckland	['oai_dc', 'rdf', 'ore']
ReStore repository	['oai_dc', 'http_header', 'oai_didl']
Revistes Catalanes amb Accés Obert	['oai_dc', 'oai_marc', 'marcxml']
Revues	['oai_dc', 'qdc', 'mets']
Rhodes eResearch Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
RiFEUP - Repositório Institucional da FEUP	['oai_dc']
Ritsumeikan Research Repository	['oai_dc']
RiuNet	['oai_dc', 'rdf', 'ore']
ROAR at University of East London	['mets', 'rdf']
Royal Holloway Research Online	['uketd_dc', 'oai_dc']
Ruhr-Universität Bochum Dissertation Server	['oai_dc', 'xMetaDiss']
Saga University Institutional Repository	['junii', 'junii2']
Sandomierz Diocese Digital Library	['oai_dc', 'dlibra_avs']
Sapientia	['oai_dc', 'rdf', 'ore']
sapporo medical university Information and KnOwledge Repository)	['junii2']
SAS-SPACE	['oai_dc', 'uketd_dc', 'didl', 'mets']
Scholarly Commons @ AUT University	['oai_dc', 'rdf', 'ore']
ScholarsArchive	['oai_dc']
ScholarsArchive@OSU	['oai_dc', 'qdc', 'rdf', 'ore', 'mods']
Scholarship@Claremont	['oai_dc', 'simple-dublin-core']
Scholarship@Western	['oai_dc', 'simple-dublin-core']
Scholarworks@GVSU	['oai_dc', 'simple-dublin-core']
Scientific documents from the Saarland University,	['oai_wgl', 'oai_dc', 'epicur', 'oai_pp']
Scientific Electronic Library Online - Argentina	['oai_dc']
Scientific Electronic Library Online - Costa Rica	['oai_dc']

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Repository Name	Metadata Standards Supported
Scientific Electronic Library Online - Cuba	['oai_dc']
Scientific Electronic Library Online - Uruguay	['oai_dc']
Scientific Open-access Literature Archive and Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rem_atom']
Scientific Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Search4Dev	['oai_dc', 'arno']
Sebelas Maret Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
SERPENT Image	['oai_dc']
Serveur académique lausannois	['oai_dc']
SerWisS - Server für wissenschaftliche Schriften der Fachhochschule Hannover	['oai_dc', 'epicur', 'oai_pp', 'xMetaDiss']
Sheffield Hallam University Research Archive	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Shiga University of Medical Science Repository	['junii2']
Shinshu University Institutional Repository	['oai_dc']
Shizuoka University REpository	['oai_dc', 'junii2']
Siberian Federal University Digital Repository	['oai_dc', 'qdc', 'rdf', 'ore']
Silesian University of Technology Digital Library	['oai_dc', 'dlibra_avs']
Simon Fraser University Institutional Repository	['oai_etdms']
Śląska Biblioteka Cyfrowa (Silesia Digital Library)	['oai_dc', 'dlibra_avs']
SOAS Research Online	['context_object', 'didl', 'mets', 'oai_dc']
Solent Electronic Archive	['oai_dc', 'uketd_dc', 'didl', 'mets']
Spiral - Imperial College Digital Repository	['uketd_dc']
SSPAL.doc	['oai_dc']
St. Luke's College of Nursing Repository	['junii2']
Stellenbosch University SUNScholar Repository	['oai_dc', 'rdf', 'ore']
Stirling Online Research Repository	['uketd_dc', 'oai_dc', 'rdf', 'ore']
Suleyman Demirel University Research Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Swedish Institute of Computer Science Publications Database	['oai_dc', 'uketd_dc', 'didl', 'mets']
Świętokrzyska Digital Library	['oai_dc', 'dlibra_avs']
Sydney eScholarship	['oai_dc', 'oai_adt', 'rdf', 'ore']
System Competence Area Document Server	['oai_dc']
Tarnow Digital Library	['oai_dc', 'dlibra_avs']
Tavistock and Portman E-Prints Online	['oai_dc', 'uketd_dc', 'didl', 'mets']

Repository Name	Metadata Standards Supported
Tesis Doctorals en Xarxa	['mets', 'qdc', 'ore', 'marc', 'didl', 'rdf']
Tesis Electrónicas de la Universidad de Chile	['oai_etdms']
The Digital Repository of University of Helsinki	['mets', 'ore', 'rdf']
The West Pomeranian Digital Library „POMERANIA”	['oai_dc', 'dlibra_avs']
Thèses en Ligne	['oai_dc']
Thèses en ligne de l'Université Toulouse III - Paul Sabatier	['context_object', 'didl', 'mets', 'oai_dc']
Theseus	['oai_dc', 'rdf', 'ore']
Tilburg University Repository	['neeo_didl', 'nl_didl_test', 'didl_test', 'oai_dc', 'arno', 'nereus', 'nl_didl']
Tokyo Metropolitan University Institutional Repository (首都大学東京機関リポジトリ)	['oai_dc']
TriCollege Digital Library	['oai_dc']
TrustSoft Publications	['oai_dc', 'uketd_dc', 'didl', 'mets']
Tsukuba Repository	['oai_dc', 'junii2', 'rdf']
TU Delft Digital Repository	['oai_dc', 'mods']
tudigit	['epicur', 'oai_dc']
tuprints	['context_object', 'didl', 'epicur', 'mets', 'oai_dc', 'rdf', 'rem_atom', 'uketd_dc', 'xMetaDiss']
TUT DPub	['oai_dc', 'rdf', 'ore']
Tver State University Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
UAL Research Online	['context_object', 'didl', 'mets', 'oai_dc']
UC Research Repository	['mets', 'rdf']
UCA Research Online	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
UCL Discovery	['oai_dc', 'uketd_dc', 'didl', 'mets', 'neeo']
uiana	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
UiS Brage	['nora_dc']
UKM Journal Article Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
ULB Sachsen-Anhalt HALCoRe	['oai_dc']
UM Digital Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
UMM Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
UNDIP Institutional Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
UniCA Eprints	['oai_dc', 'uketd_dc', 'didl', 'mets']
UnipiEprints	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']

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Repository Name	Metadata Standards Supported
UnissResearch	['oai_dc', 'uketd_dc', 'didl', 'mets']
Unitus DSpace	['oai_dc', 'rdf', 'mets']
Universidad Nacional De Colombia - Repositorio Institucional UN	['context_object', 'didl', 'mets', 'oai_dc']
Universidad Ricardo Palma	['oai_etdms']
Universidade de Lisboa: Repositório.UL	['oai_dc', 'rdf', 'ore']
Universidade do Minho: RepositoriUM	['mets', 'ore', 'rdf']
Universitas Andalas Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rem_atom']
Universität München: Elektronische Publikationen	['epicur']
Universiti Putra Malaysia Institutional Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
Universiti Teknologi Malaysia Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc']
University of Birmingham Research Archive, E-papers Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
University of Birmingham Research Archive, E-prints Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
University of Brighton Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
University of British Columbia's Information Repository	['oai_dc', 'oai_lockss', 'rdf', 'ore', 'mets']
University of Delaware Library Institutional Repository	['oai_dc', 'rdf', 'ore']
University of Dundee Online Publications	['oai_dc', 'rdf', 'ore']
University of Huddersfield Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
University of Jos Institutional Repository	['uketd_dc', 'oai_dc', 'qdc', 'rdf', 'mods', 'mets']
University of Limerick Institutional Repository	['rian_dc', 'oai_dc', 'rdf']
University of Lincoln Institutional Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
University of Liverpool Research Archive	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
University of Michigan Library Repository	['oai_dc', 'marc21']
University of Miyazaki DSpace	['junii2']
University of Nevada, Las Vegas Repository	['oai_dc', 'simple-dublin-core']
University of Newcastle\'s Digital Repository	['rif', 'marc']
University of Pretoria Electronic Theses and Dissertations	['oai_rfc1807', 'oai_dc', 'oai_etdms']
University of Queensland eSpace	['oai_dc']
University of Regensburg Publication Server	['context_object', 'didl', 'epicur', 'mets', 'oai_dc', 'uketd_dc', 'xMetaDiss']
University of Salford Institutional Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
University of Tasmania Eprints Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
University of the Ryukyus Repository	['junii', 'junii2']

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Repository Name	Metadata Standards Supported
University of Toronto Research Repository	['oai_dc', 'mets']
University of Wales Aberystwyth Repository	['uketd_dc', 'oai_dc', 'uketd_mets', 'mods']
University of Worcester Research and Publications	['oai_dc', 'uketd_dc', 'didl', 'mets']
University of Yamanashi Academic Repository	['oai_dc', 'junii']
UPCommons - E-prints UPC	['oai_dc']
USU Repository	['oai_dc', 'rdf', 'ore']
UT Repository	['oai_dc', 'junii2']
UTL Repository	['oai_dc', 'rdf', 'ore']
UTSiPress Institutional Repository	['oai_dc', 'rdf']
Utsunomiya University Academic Information Repository	['oai_dc', 'junii2', 'rdf', 'ore']
UUM IRepository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Vanderbilt Electronic Thesis and Dissertation Archive	['oai_dc', 'oai_marc', 'oai_rfc1807']
VBN	['ddf-mxd', 'mods', 'oai_dc']
Victoria University Eprints Repository	['oai_dc', 'uketd_dc', 'didl', 'mets']
VizieR Catalogue Service	['oai_dc']
Volltextserver der Virtuellen Fachbibliothek Psychologie	['oai_wgl', 'oai_dc', 'epicur', 'oai_pp']
Volltextserver Universität Ulm - VTS Publication Service	['oai_dc', 'epicur', 'xMetaDiss', 'XMetaDissPlus']
Wageningen Yield	['oai_dc', 'mods', 'collexis', 'nl_didl']
Warwick Research Archives Portal Repository	['context_object', 'didl', 'eap', 'mets', 'mods', 'neeo', 'oai_dc']
Waterford Institute of Technology Repository	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']
Wejherowo Digital Library	['oai_dc']
White Rose E-theses Online	['oai_dc', 'uketd_dc', 'didl', 'mets']
White Rose Research Online	['oai_dc', 'uketd_dc', 'didl', 'mets']
Wielkopolska Biblioteka Cyfrowa	['oai_dc', 'dlibra_avs', 'mets', 'oai_qdc']
Wintec Research Archive	['context_object', 'didl', 'mets', 'oai_dc']
Wits Unstitutional Repository on DSPACE	['oai_dc', 'rdf', 'ore']
Wolverhampton Intellectual Repository and E-theses	['uketd_dc']
Yamaguchi University Navigator for Open access Collection and Archives	['oai_dc']
Yokohama National University Repository	['oai_dc']
York St John University ArchivalWare Digital Library	['oai_dc', 'qdc', 'oai_marc']
YOU Campus Repository	['junii', 'junii2']

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Repository Name	**Metadata Standards Supported**
Zhytomyr State University Library	['context_object', 'didl', 'mets', 'oai_dc']
Zielonogórska Biblioteka Cyfrowa (Digital Library of Zielona Gora)	['oai_dc', 'dlibra_avs']
Zurich Open Repository and Archive	['context_object', 'didl', 'mets', 'oai_akaber', 'oai_datacite_dc', 'oai_dc']
Інституційний репозитарій Української академії банківської справи Національ (Electronic Ukrainian Academy of Banking of the National Bank of Ukraine Institutional Repository)	['oai_dc', 'rdf', 'ore']
Наукова електронна бібліотека періодичних видань НАН України (Vernadsky National Library of Ukraine)	['oai_dc', 'rdf']
Цифровий репозиторій ХНАМГ (KNAME Digital Repository)	['context_object', 'didl', 'mets', 'oai_dc', 'rdf', 'rem_atom']