



Canadian Core Learning Object Metadata Application Profile

Norm Friesen

[normf@athabascau.ca](mailto:normf@athabascau.ca)

[www.cancore.ca](http://www.cancore.ca)



# Overview

- the E-Learning Space
- What is CanCore?
- Why CanCore?
- CanCore's metadata guidelines
- Other CanCore/AU aids for implementers



# What are Learning Objects?

- Any digital resource that can be reused for the purposes of teaching and learning.
- Why learning objects?

"stand-alone applications are incompatible with typical production, distribution, and usage patterns for educational software."

J. Roschelle, et.al.



# What are Learning Objects?

- Reusable
- Modular
- Free and at cost
- Flexible
- Portable
- Interoperable
- Annotation, adding value



# What are Learning Object Repositories?

A collection of digital assets and/or meta-data accessible without prior knowledge of the repository's structure through a interoperable functions via a network.

- Adapted from IMS Digital Repositories Interoperability Specification
- Assets and metadata can be separate
- To prevent "silos" or "stovepipes"



# What is CanCore?

- Based on and fully compatible with the first e-learning standard: IEEE 1484.21.1, LOM 1.0, IMS Meta-data
- "multi-part Standard to facilitate search, evaluation, acquisition, and use of learning objects..."
- "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."



# What is CanCore?

- Application profile: "customization of a standard to meet the needs particular communities of implementers with common applications requirements."
- Subset of LOM elements: 76 down to 56; 39 are active
- Guidelines document: best practice recommendations, 175 pp.



# Rationale: Simplicity

- LOM: leading educational metadata specification
- LOM Data Model too complicated for effective implementation:

*"Many vendors [have] expressed little or no interest in developing products that [are] required to support a set of meta-data with over 80 elements"*

*Best Practices and Implementation Guide, IMS, 2000*





# Rationale: Simplicity

- LOM Element 5.4 Semantic Density:  
"The degree of conciseness of a learning object."
  - omitted in CanCore
- LOM Element 1.2 Title  
"Name given to this learning object."
  - Word order, subtitles, multilingual titles, series/episode titles
- LOM Classification Element Group  
"Describes where this learning object falls within a particular classification system."



# Rationale

- Solution: core set of LOM elements most important for exchangeable resource descriptions
- Mid-way between **structuralist** (LOM) and **minimalist** (Dublin Core) approaches to metadata



# Rationale: Semantics

- E-learning specifications & standards communities are largely concerned with syntax and technical interoperation
- Effective metadata requires semantic specification and consensus
- Incorporate best practice from library and heritage communities
- No other body is doing this across e-learning projects



# Rationale: Specificity

- Effective implementation requires a consistent interpretation of each element's purpose and use
- Realize economy of scale by coordinating the implementation and interpretation of metadata for a number of learning object repository projects



# Rationale: Overview

Complexity decreases

LOM  
Data Model:  
76 elements,  
little inter-  
pretation



Specificity and  
Interoperability increases



# CanCore Guidelines

- explication and interpretation of element definitions and descriptions
- recommendations based on best practice
- recommendations for vocabulary (or "value space") values and definitions
- multilingual plain language examples
- XML-binding examples
- technical implementation notes



# CanCore's Community: input

- Academic Technologies for Learning of the University of Alberta
- Alberta Learning
- Athabasca University
- British Columbia Open University
- Centre recherche LICEF
- CETIS UK
- Department of National Defense, Canada
- Eisenhower National Clearinghouse
- The Electronic Text Centre of the University of New Brunswick
- European Knowledge Network
- Galbraith Media
- Katholieke Universiteit Leuven
- Learning and Teaching Scotland
- Library and Archives of Canada
- Manitoba Education and Youth
- Memorial University
- Ontario Ministry of Education
- The Open Learning Agency of British Columbia
- Stem-Net NFLD-Lab.
- TeleEducation New Brunswick
- University of Calgary



# Guidelines



## CanCore Guidelines 1.9



Norm Friesen (ed.)  
Athabasca University





<i>Explanation</i>	<i>Size</i>	<i>Order</i>	<i>Value Space</i>	<i>Datatype</i>	<i>Used in element subsets</i>
The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.	1	unspecified	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum: 1000 char)	CanCore – Yes SCORM – Mandatory Curriculum Online – Not Applicable The Learning Federation – Mandatory SingCore - Yes

*The standard name for the identification scheme that is used to reference the resource.*

## Clarification

*When the identifier for the object, use "URN" (Uniform Resource Name) when the address is not dependent to persistence and availability.*

- Most catalogues are known by a standard abbreviation. Use this abbreviation rather than spelling out the name of the catalogue (e.g. use "DOI" rather than "Digital Object Identifier").
- This element may be used in conjunction with 7.2.1:Relation.Resource.Identifier (and its child elements) to indicate relations between learning objects. For example, when URN values are associated with objects in a collection, they can be linked together by including the URNs of related objects in any one metadata record.

### *Vocabulary Recommendations*

CanCore recommends that the vocabulary values for this element include, but not be limited to "URI", "URL", "URN", "PURL", "DOI", "ISBN", "ISSN". (Recommendations for the formulation of globally unique, location-independent, persistent identifiers are available from CanCore at: <http://www.cancore.ca/documents/Resourceids.doc>.)

### **URI** Uniform Resource Identifier

<http://www.w3.org/Addressing/>

A URI is any short string of referring to an abstract or physical resource (e.g. <http://www.careo.org>, <urn:path:/C/mydocs/document.doc>, <mailto:norm.friesen@ualberta.ca>). The document "RFC2396" defines the generic syntax of URI, and provides guidelines for their use (see: <http://www.ietf.org/rfc/rfc2396.txt>). Because of its generality, CanCore discourages its use as a value for 1.1.1:Catalog.



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# Survey of use

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# Best Practice Recommendations

## Technical Implementation Notes

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# Vocabulary Definitions



# CanCore Guidelines

CanCore LOM Guidelines, Syslink - Microsoft Internet Explorer

Address: http://www.educ.ualberta.ca/~cancore/default.cfm

## CanCore

Canadian Core Learning Resource Metadata Application Profile

Home | FAQ | Mailing List | Documents | Presentations | Links | About CanCore

CanCore Home > Documents

Search the Guidelines:

Browse Guidelines for which profile?

- All LOM elements
- CanCore
  - Sponsor of this service: CanCore provides guidance on interpretation and implementation as a level of detail that is much greater than the normative information provided in the LOM—but in no case, does CanCore seek to diverge from the general, normative framework provided by the LOM.
  - The Shareable Content Object Reference Model (<http://www.adlnet.org>) profiles the LOM in addition to a number of other specifications that it integrates into an over-arching model or architecture. It designates LOM elements as "mandatory" or "optional" for different types or levels of content aggregates. CanCore uses these designations provided by SCORM for what it calls "Shareable Content Objects" (SCOs), the most prominent type of content aggregation in the SCORM.
- SCORM (SCD mandatory)
- uk10mcore (mandatory elements)
- SingCORE
- The Learning Federation (mandatory)
- Dublin Core
- TRITS 39

On what level of detail?

- All info: everything
- Basic info: name, lom\_number, lom\_explanation, size, order, datatype, vocab
- Tech info: basic + tech\_notes, xml\_ag
- Semantic info: basic + guidelines, explain

CanCore Guidelines - Microsoft Internet Explorer

Address: http://www.educ.ualberta.ca/~cancore/results.cfm

<catalog>ISSN+</catalog>

<catalog>DOI+</catalog>

**1.1.2 Entry** Size: 1 Data Type: CharacterString (smallest permitted maximum: 1000 Order: 1)

Value Space: Repertoire of ISO/IEC 10646-1:2000

Explanation: The value of the identifier within the identification or cataloging scheme that designates or identifies this learning object. A namespace specific string.

CanCore guidelines:

**Provide the actual value of the URN or identifier as derived from any specified identification scheme.**

**Text Example:**

```
http://www.ualberta.ca/~mfriesen/eno" (Catalog=URI)
"ai.nalicampus.edu:R50253" (Catalog=URN)
"0-89397-441-2" (Catalog=ISBN)
```

**XML Example:**

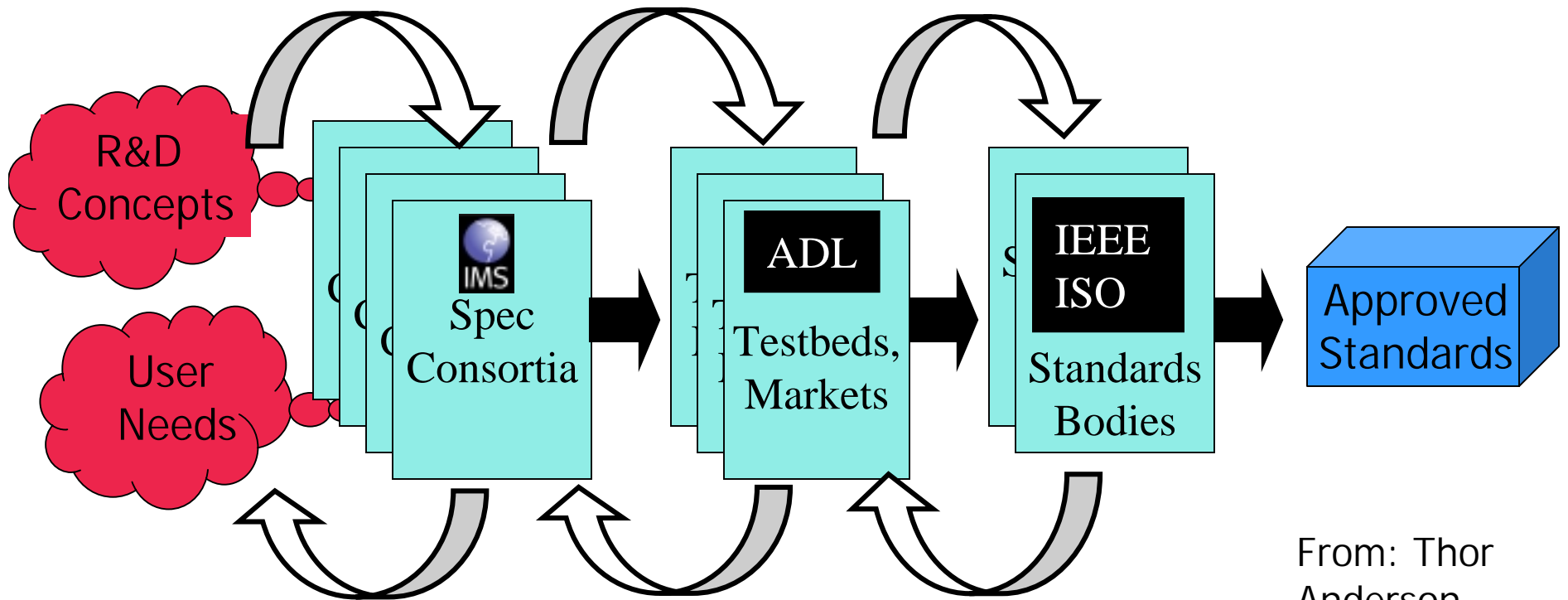
```
<identifier>
  <catalog>URI+</catalog>
  <entry>http://www.ualberta.ca/~mfriesen/eno+</entry>
</identifier>

<identifier>
  <catalog>URN+</catalog>
  <entry>ai.nalicampus.edu:R50253+</entry>
</identifier>

<identifier>
  <catalog>ISSN+</catalog>
  <entry>0-89397-441-2+</entry>
</identifier>
```



# CanCore and Standards Evolution



Specifications

Implementations,  
Reference Models,  
Requirements  
[www.cancore.ca](http://www.cancore.ca)



From: Thor  
Anderson,  
(2001)  
"International  
E-learning  
Specifications"  
© IMS

Metadata Forum,  
September 19, 2003



# CanCore's Participation in Standardization

- IMS: Next steps re: maintenance
- IEEE LTSC:
- ISO Subcommittee on "Information Technology for Learning Education and Training
- Survey, proposal for new approach to the LOM standard.





# Other CanCore/AU aids for implementers

- <http://adlib.athabascau.ca>
- Upload or link to resources
- Simplified interface based on CanCore best practice recommendations
- **Create XML record, submit to a database, submit to AD LIB**

The screenshot shows a web browser window displaying the AD LIB (Athabasca Digital Library) interface. The page title is "AD LIB Athabasca Digital Library". The main content area contains a form for creating a new object. The form is divided into several sections:

- General information:** Includes fields for "Object ID", "Title", "Web address" (with a "http://" prefix), and "Description".
- Metadata contributors:** Includes a "Type" dropdown menu (set to "Creator"), "Name" (Norm Pilsen), "Email" (norm@athabascau.ca), and "Organisation" (Athabasca University).
- Learning object contributors:** Includes a "Type" dropdown menu (set to "Author"), "Name", "Email", and "Organisation" fields.

A "Preview before submitting" button is located at the bottom of the form. Below the form, there is a link to "Add more information". The footer of the page contains navigation links: Home, AD LIB repository, Digital Reading Room, About AD LIB, Related projects, Contact us, Search, Help, Account, My choice, My metadata, Add new Learning Object, Add metadata.



## CanCore Metadata Generator [CAREO](#)

### General information:

<u>Title:</u>	<input type="text"/>
<u>Web address:</u>	<input type="text" value="http://"/> <span>+ -</span>
<u>Description:</u>	<div style="border: 1px solid #ccc; height: 100px; vertical-align: top;"></div> <span>+ -</span>
<u>Keywords:</u>	<input type="text"/> <span>+ -</span>
<u>Language:</u>	<div style="border: 1px solid #ccc; padding: 2px;"><div style="background-color: #4a7ebb; color: white; padding: 2px;">English</div><div style="padding: 2px;">French</div><div style="border-top: 1px dashed #ccc; padding: 2px;">American English</div><div style="padding: 2px;">British English</div></div>

### Author and other contributors: + -

<u>Type of contributor:</u>	<input type="text" value="Author"/>
<u>Name:</u>	<input type="text"/>
<u>Email:</u>	<input type="text"/>
<u>Organization:</u>	<input type="text"/>



## Other CanCore/AU aids for implementers

- Web-based; no software to download/install
- Portable, self-contained, linked
- Create, store and search metadata
- Open Source
- Open protocols for sharing records
- Browser-independent



# Other CanCore/AU aids for implementers

- LOM Java Binding:
  - Interface or API providing functions for working with LOM data in software systems
  - Implementation neutral Java interfaces for exposing data objects corresponding to those of the LOM
  - can be used by Java programmers for representation of LOM data objects within their own software
  - as an interoperable way to communicate LOM data objects with external third party software components



# LDAP LOR

- LDAP: *A network protocol designed to work on TCP/IP stacks to extract information from a hierarchical directory; a tool to comb through data to find a particular piece of information.*
- Builds a LOM record out of LDAP results
- distributed service for resolving globally unique identifiers into their locations



# LDAP LOR

- Based on functions outlined in the IMS Learning Object Repository Interoperability Specification ([www.imsglobal.org](http://www.imsglobal.org)):
  - Harvest, Request, Search, Submit, list Results
  - Developed for LOM data model



## MARC → CanCore/LOM

- Abstract datamodel-crosswalk developed with CanCore and MARC experts
- Automatic conversion of MARC records to XML-formatted CanCore/LOM records
- <http://edusource.athabascau.ca/>



# Supporters

- CANARIE
- Multimedia Learning Group, Industry Can.
- Alberta Learning
- Athabasca University
- University of New Brunswick
- Office of Learning Technologies
- TeleEducation NB New Brunswick
- NETERA





Find out more about  
CanCore at:  
[www.cancore.ca](http://www.cancore.ca)