CanCore Guidelines Version 2.0: Life Cycle Category

History of Life Cycle Category Document

Date	Version	Comment	Person
June 6, 2002	1.1	Based on IMS Learning Resource Meta-data 1.2.1	Sue Fisher
December 6, 2002	1.8	Based on IEEE 1484.12.1 LOM	Norm Friesen
January 22, 2003	1.8.9	Revisions incorporated; format changed	Norm Friesen
July 18, 2003	1.9	Revisions; examples added	Norm Friesen
November 21, 2003	2.0	Final revisions incorporating feedback	Norm Friesen

Use of Life Cycle Category Elements in Other Application Profiles

Element	CanCore	SCORM	Curriculum Online	TLF	Sing-CORE	UK LOM Core	Dublin Core
2:Life Cycle	Y	M	M	M	Y	M	
2.1:Version	Y	M	O	M	Y	O	
2.2:Status	N	M	O	M	N	O	
2.3:Contribute	Y	O	M	Y	Y	M	
2.3.1:Role	Y	O	M	O	Y	M	
2.3.2:Entity	Y	O	M	M	Y	M	DC.Creator* or DC.Other** Contributor or Publisher***
2.3.3:Date	Y	O	M	M	Y	O	DC.Date****

*when 2.3.1:Role has a value of Author
**with the type of contribution specified in 2.3.1:Role
***when 2.3.1:Role has a value of Publisher
****when 2.3.1:Role has a value of Publisher

Legend:

Y = Yes, Included in Subset
O = Optional
N = No, Not Included in Subset
M = Mandatory
DC = Dublin Core

2:Life Cycle

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
This category describes the history and current state of this learning object and those entities that have affected this learning object during its evolution.	1	Unspecified	-	-

This element group describes the development of and contributions to the learning resource, accommodating the roles associated with collaborative development.

Use the Life Cycle category to identify contributing person(s) and/or organization(s) for purposes of resource discovery, keeping contact and personal details to a minimum.

- In the domain of software development, Life Cycle refers to "the phases a software product goes through between when it is conceived and when it is no longer available for use" (Free On-Line Dictionary of Computing; http://foldoc.doc.ic.ac.uk). These phases are often cyclical, and can include initiation, validation, and termination. Learning resources and multimedia resources, created collaboratively by teams of specialists, may follow similar development cycles.

The sub-elements in this category are:

2.1:**Version**
2.2:Status
2.3:**Contribute**
  2.3.1:**Role**
  2.3.2:**Entity**
  2.3.3:**Date**

Elements listed in **bold** are included in the CanCore application profile.

Examples

- Version: Beta
  Status: draft
  Contribute
  Role: editor
  Entity: Dr. John W. Smith, Open Learning Agency
  Date: 2003
- Version: 1.8
  Status: revised
  Contribute
  Role: author
  Entity: Jane Doe, CAREO; Mary Smith, CAREO
  Date: May, 2003

XML Examples

```
<lifeCycle>
  <version>
    <string language="eng">beta</string>
  </version>
  <status>
    <source>LOMv1.0</source>
    <value>draft</value>
  </status>
  <contribute>
   <role>
    <source>LOMv1.0</source>
    <value>editor</value>
   </role>
   <entity>
    BEGIN:VCARD
    VERSION:3.0
    N:Smith;John;W.;Dr.;
    FN:Dr. John W. Smith
    ORG:Open Learning Agency
    END:VCARD
   </entity>
   <date>
    <dateTime>2003</dateTime>
   </date>
  </contribute>
</lifeCycle>

<lifeCycle>
  <version>
    <string language="none">1.8</string>
  </version>
  <status>
    <source>LOMv1.0</source>
    <value>revised</value>
  </status>
  <contribute>
   <role>
    <source>LOMv1.0</source>
    <value>author</value>
   </role>
   <entity>
    BEGIN:VCARD
    VERSION:3.0
    N:Doe;Jane;
    FN:Jane Doe
    ORG:CAREO
    END:VCARD
   </entity>
```

```
    <entity>
      BEGIN:VCARD
      VERSION:3.0
      N:Smith;Mary;
      FN:Mary Smith
      ORG:CAREO
      END:VCARD
    </entity>
    <date>
      <dateTime>2003-05</dateTime>
    </date>
 </contribute>
</lifeCycle>
```

2.1:Version

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The edition of this learning object.	1	Unspecified	-	LangString (smallest permitted maximum: 50 char)

Provide a version statement that appears on the learning resource and/or that is descriptive of it.

- This element is understood as describing software versioning conventions (e.g., alpha, beta) as well as document publication conventions (e.g., first edition).
- This element is not intended to convey document status information (e.g., draft, revised, final) nor series number information (e.g., episode 12). For document status information, refer to element 2.2:Status.
- If no version information is provided, do not use this field.

Examples

- alpha
- 1.2
- 2.8.11.15
- limited edition
- second edition
- revised edition

XML Examples

```
<version>
  <string language="eng">alpha</string>
</version>

<version>
  <string language="none">1.2</string>
</version>

<version>
  <string language="none">2.8.11.15</string>
</version>

<version>
  <string language="eng">limited edition</string>
  <string language="fra">édition limitée</string>
</version>

<version>
  <string language="eng">second edition</string>
</version>
```

```
<version>
  <string language="eng">revised edition</string>
</version>
```

2.2:Status

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The completion status or condition of this learning object.	1	Unspecified	draft final revised unavailable	Vocabulary (State)

Indicate the position of the learning resource in a project workflow or other process or ranking system internal to a collection or project.

CanCore does not recommend the use of this element for the purposes of interoperation in distributed environments.

- The meanings of the vocabulary values provided for this element are most appropriate for written resources, not multimedia or software resources (whose development status would be better described through 2.1:Version).
- If these values were applied to learning resources more generally, the values recommended for this element would designate stages that are part of a workflow or process internal to a project or organization. As a result, it appears that they would be of limited use for facilitating resource discovery within a single collection, and especially across collections or domains.
- This element is used in some implementations for filtering results sets, limiting access to resources not yet complete. Such an application of this element is best determined internal to a collection or project.

Vocabulary Recommendations

draft
According to the *Oxford English Dictionary* (1989), a draft is a "rough form of a writing or document" (*OED*).

final
This value "mark[s] the last stage of a process" (*OED*).

revised
This value refers to a learning resource that has been "corrected" or "amended" (*OED*).

unavailable
This value is used when the learning resource is "not available" (*OED*). It may be useful for indicating those records not to be included in search results, or for records describing resources that are only temporarily unavailable.

Example

- draft

XML Example

```
<status>
 <source>LOMv1.0</source>
  <value>draft</value>
</status>
```

2.3:Contribute

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
Those entities (i.e., people, organizations) that have contributed to the state of this learning object during its life cycle (e.g., creation, edits, publication). Note 1: This data element is different from 3.2:Meta-Metadata.Contribute. Note 2: Contributions should be considered in a very broad sense here, as all actions that affect the state of the learning object.	Smallest permitted maximum: 30 items	Ordered	-	-

Describe who has contributed to the learning resource, keeping contact and personal details to a minimum. Indicate the nature and date of the contribution. Rank important contributors and contributions either by order of significance or alphabetically.

2.3:Contribute consists of:

2.3.1:Role
2.3.2:Entity
2.3.3:Date

- The LOM is neither a system for version control nor a means of storing contact information. It can also be costly and cumbersome to record and maintain contact, personal, and organizational details. CanCore therefore recommends keeping information included in the 2.3:Contribute element aggregation to a minimum.

- The 2.3:Contribute aggregate element contains three simple elements: 2.3.1:Role, 2.3.2:Entity, and 2.3.3:Date. Record creators should be able to rely on support for at least 30 repetitions of this entire aggregate being provided by LOM systems. This allows for many combinations of roles, entities, and dates to be recorded. For each repetition of the element aggregate, 2.3.2:Entity should similarly be repeatable at least 40 times. This means that for each particular role and date identified, 40 or more individual contributors (people, organizations, etc.) can be listed.

- The 2.3:Contribute aggregate element presents the same structure as the 3.2:Meta-Metadata.Contribute aggregate element. However, the purpose of each element set, as well as the vocabulary used to identify roles in each, is different.

- The repetitions for both 2.3:Contribute and 2.3.2:Entity are Ordered. This means that people or systems accessing this information may treat the sequence in which contribution information is listed as significant, as indicating rank and precedence of contribution types or entities. For example, 2.3.2:Entity may be repeated to record multiple authors, and the author listed first may be interpreted as making the primary authorial contribution. Where order is *not* important, CanCore recommends that authors or element repetitions be sequenced

alphabetically.

- The 2.3:Contribute aggregate element contains three simple or non-aggregate elements: 2.3.1:Role, 2.3.2:Entity, and 2.3.3:Date. Of these, only Role has a multiplicity greater than one. For each iteration of 2.3:Contribute, Role can be repeated up to 40 times. These repetitions are also ordered, meaning that the rank or precedence of individual contributors – individual authors, editors, etc. – can also be indicated through this ordering. Again, if order is not important, or indications of rank and precedence are to be avoided, CanCore recommends listing individual contributors alphabetically.

- Together, the repetitions permitted for the Contribute and Role elements mean that up to 1200 possible instances of contributor types and identities can be accommodated.

- The elements and their relationships that make up the 2.3:Contribute aggregate are similar to those in the 3.2:Meta-Metadata.Contribute aggregate. But 2.3:Contribute describes the learning resource, and 3.2:Meta-Metadata.Contribute describes the metadata record.

- Including many roles may multiply record creation work, while not greatly increasing discoverability.

Examples

- Role: editor
  Entity: Smith, Dr. John S.; Open Learning Agency
  Date: 2003
- Role: author
  Entity: Doe, Joe; CAREO and Smith, Mary; CAREO
  Date: May, 2003
- Role: author
  Entity: Friesen, Norm
  Date: May, 2000
  Role: publisher
  Entity: Athabasca University
  Date: 2003

XML Examples

```
<contribute>
  <role>
    <source>LOMv1.0</source>
    <value>editor</value>
  </role>
```

```
    <entity>
      BEGIN:VCARD
      VERSION:3.0
      N:Smith;John;W.;Dr.;
      FN:Dr. John W. Smith
      ORG:Open Learning Agency
      END:VCARD
    </entity>
    <date>
      <dateTime>2003</dateTime>
    </date>
  </contribute>

  <contribute>
    <role>
      <source>LOMv1.0</source>
      <value>author</value>
    </role>
    <entity>
      BEGIN:VCARD
      VERSION:3.0
      N:Doe;Joe;
      FN:Joe Doe
      ORG:CAREO
      END:VCARD
    </entity>
    <entity>
      BEGIN:VCARD
      VERSION:3.0
      N:Smith;Mary;
      FN:Mary Smith
      ORG:CAREO
      END:VCARD
    </entity>
    <date>
      <dateTime>2003-05</dateTime>
    </date>
  </contribute>

  <contribute>
    <role>
      <source>LOMv1.0</source>
      <value>author</value>
    </role>
    <entity>
      BEGIN:VCARD
      VERSION:3.0
      N:Friesen;Norm;
      FN:Norm Friesen
      END:VCARD
    </entity>
```

```
    <date>
      <dateTime>2000-05</dateTime>
    </date>
  </contribute>
  <contribute>
    <role>
      <source>LOMv1.0</source>
      <value>publisher</value>
    </role>
    <entity>
      BEGIN:VCARD
      VERSION:3.0
      N:None;
      FN:None
      ORG:Athabasca University
      END:VCARD
    </entity>
    <date>
      <dateTime>2003</dateTime>
    </date>
  </contribute>
```

2.3.1:Role

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
Kind of contribution. NOTE: Minimally, the Author(s) of the learning object should be described.	1	Unspecified	author publisher unknown initiator terminator validator editor graphical designer technical implementer content provider technical validator educational validator script writer instructional designer subject matter expert	Vocabulary (State)

Indicate the function or part performed by the person, institution, etc. contributing to the resource.

- Use a separate 2.3:Contribute group for each role that applies to the learning resource at hand. Most resources will likely have an Author and a Publisher —additional roles should be added where appropriate and where they will facilitate resource discovery.

Vocabulary Recommendations

author (*auteur*)
The author is an entity primarily responsible for making the content of the resource. An author can be a person, institution, group, or other entity. "The person who originates or gives existence to anything" (*OED*).

publisher (*maison d'édition*)
The individual or organization responsible for making the resource available in its present form, such as a publishing house, a university department, or a corporate entity. "One who publishes or makes something public" (*OED*).

unknown (*inconnu*)
Use this term for any named individual or organization whose contribution or role you are unsure of.

initiator (*initiateur*)
The initiator is the person, institution, or funding agency responsible for originally causing the development process. If the initiator is the same entity as the author, simply list once as the author. "One who or that which initiates" (*OED*).

terminator (*finisseur*)
The terminator is the person or entity responsible for intentionally removing access to the resource. "One who or that which terminates" (*OED*).

validator (*evaluateur*)
The validator is the person or entity responsible for confirming the overall integrity of the resource. "One who or that which confirms the validity of something" (*OED*).

editor (*rédacteur/éditeur*)
The editor is the person or entity responsible for the revision of the resource for the purposes of publication or public presentation. This role seems closest to the work currently undertaken by those responsible for digitizing and repurposing analog and other resources. Because digitizers and repurposers will be making decisions of an editorial nature (e.g., colour depth, size, sampling rates), and because the LOM provides no specific value for this role, CanCore recommends that they be listed as editors. May compile the work of multiple authors, or enforce common style and usage practices. "One who prepares the literary work of another person or number of persons for publication, by selecting, revising, and arranging the material; also, one who prepares an edition of any literary work; one who cuts and edits a film" (*OED*).

graphical designer (*designer graphique*)
The graphical designer is the specialist or entity responsible for the construction of the visual elements of a resource. Usually works with a team that includes the roles of instructional designer(s), content provider(s), etc.

technical implementer (i*nstallateur technique*)
The technical implementer is the specialist or entity using specialized software or equipment in the development of a resource, or for technical support. Usually works with a team that typically includes the roles of instructional designer(s), content provider(s), etc.

content provider (*fournisseur de contenu*)
The content provider is a person or entity that is secondarily responsible for the content of the resource. This can be an aggregator. It can also be an original creator, the content of whose resource has been used in part in the resource or has been significantly changed in being aggregated, repurposed, or digitized. In the context of an instructional design team, the content provider may be the subject matter expert, qualified to provide information about content used in the development process.

technical validator (*évaluateur technique*)
The technical validator is the person or entity responsible for confirming the technical integrity of the resource.

educational validator (*évaluateur pédagogique*)
The educational validator is the person or entity responsible for confirming the educational integrity of the resource.

script writer (*scénariste*)
The script writer is the person or entity responsible for the creation of a text read or performed in an audio, video, and/or interactive learning resource. Usually works with a team that includes the roles of instructional designer(s), content provider(s), etc. Use the author value if the script writer is primarily responsible for the content of the resource as a whole.

instructional designer (*ingénieur pédagogique*)
The instructional designer is the specialist or entity responsible for applying research-based principles to the design of instruction. Usually plays a consultative role in a team that typically includes the roles of graphical designer(s), content provider(s), etc.

subject matter expert (*expert-contenu*)
The subject matter expert is the person qualified to provide information about content used in the development process. In the context of an instructional design team, the content provider may be the subject matter expert.

Example

- author

XML Example

```
<role>
 <source>LOMv1.0</source>
 <value>author</value>
</role>
```

2.3.2:Entity

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
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.	Smallest permitted maximum: 40 items	Ordered	vCard, as defined by IMC vCard 3.0 (RFC 2425, RFC 2426)	CharacterString (smallest permitted maximum: 1000 char)

The content of the 2.3.2:Entity element is governed by the vCard (virtual business card) specification (www.imc.org/pdi/) and, as such, could contain very specific information about contributors such as e-mail address, affiliation, and address. CanCore does not recommend tracking detailed or exhaustive affiliation information in the metadata record for a resource. A record describes the properties of a learning resource and should not contain information peripheral to that resource. Affiliation information is subject to change, difficult to track, and would necessitate a data management model separate from that necessary to maintain a metadata record that describes a learning resource.

CanCore strongly recommends that contact information for contributors not be stored in the metadata for the learning resource itself.

- The vCard specification is intended for the interchange of personal contact and affiliation information, such as that found on business cards or personal homepages. It includes dozens of elements, including time zone, photograph, logo, and delivery address.

- Three elements or properties are declared to be mandatory in the vCard specification. As defined in the vCard specification itself, these are:
    - FN (formatted person's name; e.g., Mr. John Q. Public, Esq.)
      "FN is a (possibly ambiguous) name by which the person is commonly known and conforms to the naming conventions of the country or culture with which it is associated. A value for FN is a text string. For example, a typical name of a person in an English-speaking country comprises a personal title if required (e.g., Mr., Ms., Dr., Professor, Sir), a first name, middle name(s) and/or initial(s) if any, a last name, a generation qualifier if any (e.g., Jr.), and decorations and awards if any (e.g., QC). It is based on the semantics of the X.520 Common Name attribute."
    - N (structured person's name; e.g., Stevenson;John;Philip,Paul;Dr.;Jr.)
      "N is a list of components separated by the SEMICOLON character in the following sequence: Family Name, Given Name, Additional Names, Honorific Prefixes, and Honorific Suffixes. Each component can have multiple values (e.g., multiple Additional Names) separated by the COMMA character (ASCII decimal 44). This type is based on the semantics of the X.520 individual name attributes [sic], and is a single structured text value"

- VERSION (The value of the VERSION property, as per the LOM specification, will always be 3.0.)

- CanCore further recommends that a fourth vCard element, ORG, be included in the context of LOM records:
  - ORG (the name and optionally the unit or units of the organization; e.g., ORG:ABC, Inc.;North American Division;Marketing)
    This is the institutional entity with which the person is associated as a contributor to the learning resource. CanCore recommends including specific organizational unit(s) as described in the vCard specification, going from general (e.g., university or corporation name) to specific (e.g., department or division).

- Name in vCard 3.0 applies only to a person and is a mandatory element. However, corporate contributions may be made to a learning resource where no actual values for the mandatory FN (formatted name) and N (structured name) properties exist. Best and common practices for dealing with this issue have not yet emerged, but CanCore recommends that a pseudo-value of "none" be supplied for FN and N elements when a corporate author is being described.

Technical Implementation Notes

- To save some data-entry effort, implementers should consider automatic population of FN based on manually entered values for N and the naming conventions of the specific country or culture. For example, in contexts where English, French, or some other European languages dominate, a string representing a value of N would be formulated as follows:
  - [family name];[given name];[additional names];[honorific prefixes];[honorific suffixes]

  This can be translated into the following FN value:
  - [honorific prefixes] [given name] [additional names] [family name], [honorific suffixes]

Examples

- Smith, John W.
- Athabasca University

*XML Examples**

```
<entity>
  BEGIN:VCARD
  VERSION:3.0
  N:Smith;John;W.
  FN:John W. Smith
  ORG:Athabasca University
  END:VCARD
</entity>
```

```
<entity>
  BEGIN:VCARD
  VERSION:3.0
  N:None;
  FN:None
  ORG:Athabasca University
  END:VCARD
</entity>
```

*vCard uses non-XML encoding, requiring its own parsing rules and supporting technologies. Given different behaviours of existing parsing tools for XML and vCard, best and common practices for the optimal formulation of vCard encoding are not yet clear. It may be best to insert vCard encoding into a LOM XML record as a "CDATA section" as follows:

```
<entity>
<![ CDATA[ BEGIN:vCARD
VERSION:3.0
N:Smith;John;W
FN:John W. Smith
END:vCARD]]>
</entity>
```

2.3.3:Date

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The date of the contribution.	1	Unspecified	-	DateTime

Where known and appropriate, indicate a date on which the contribution was made or completed.

- Dates of creation and publication will likely be most important.
- This element has the LOM datatype of DateTime, which is based the ISO 8601:2000 standard for expressing date and time. This ISO standard is summarized at http://www.w3.org/TR/xmlschema-2/#isoformats.
- According to the LOM datatype and in keeping with the ISO standard, dates should be expressed in the YYYY-MM-DD format. For general or partial dates, eliminate values as necessary from right to left: YYYY (a year date only), or YYYY-MM (a year and month date only).
- Textual descriptions of date are permissible if the date cannot be expressed in structured, numeric form, or if textual information is needed to supplement the structured, numeric value.
- The use of 2.3.3:Date should correspond with the 2.3:Contribute category of which it is a part. For example, if the date of authorship is known, include it in the same 2.3:Contribute group that contains 2.3.1:Role = Author; if the date of termination is known, include it in the same contribute group that contains 2.3.1:Role = Terminator. For many learning resources, the only date that will be known or given will correspond to the 2.3:Contribute category containing 2.3.1:Role = Publisher.

Examples

- 2003
- April, 2002
- January 15, 2003
- April 15th, 1998 (First quarter 1998)

XML Examples

```
<date>
  <dateTime>2003</dateTime>
</date>

<date>
  <dateTime>2002-04</dateTime>
</date>
```

```
<date>
  <dateTime>2003-01-15T12:00:00.0</dateTime>
</date>

<date>
  <dateTime>1998-04-15</dateTime>
  <description>
    <string language="eng">First quarter of 1998</string>
    <string language="fra">le premier trimestre de1998
</string>
  </description>
</date>
```