

## **IEEE Standard for Learning Object Metadata**

### **1484.12.1**

Sponsored by the  
Learning Technology Standards Committee of the IEEE (<http://ltsc.ieee.org>)

## **Summary of Changes**

from

**Working Group Draft v6.1, 6.2, 6.3, & 6.4**

to

**Final Draft\* LOM Standard v1.0**

The full and final 1484.12.LOM specification is available at <http://ltsc.ieee.org/wg12/>

\* as approved by IEEE RevCom on June 12, 2002

## Introduction

On June 12, 2002 the IEEE Review Committee approved the 1484.12.1 Learning Object Metadata draft making this the first fully approved IEEE standard to emerge from the Learning Technology Standards Committee (LTSC).

In the course of developing this standard over the past few years, the LOM Working Group created many versions of the draft document which were subsequently used by those wanting to understand, test and implement these initial metadata specifications. With the completion of the balloting and approval process there is now a final standard document.

The following summary of changes has been created to assist those wanting to know how the final specification has changed from the most previous drafts, specifically from Working Group draft version 6.1 to the final specification which represents the approved LOM 1484.12.1 standard v1.0

There is a single table which provides a side by side comparison between these two drafts with the changes highlighted in color. This is then followed by a detailed list of each change.

The full and final 1484.12.LOM specification is available at <http://ltsc.ieee.org/wg12/>

## Acknowledgements

Thanks from the Chair and Technical Editor of the IEEE 1484.12.1 Learning Object Metadata standard go to Andrew Johnson and Judy Brown from the University of Wisconsin, USA ADL Academic Co-Lab for their significant contribution to create the initial summary and subsequent reviews of this document.

Previous Working Draft v6.1		Final Draft LOMv1.0	
1.	General	1.	General
1.1.	Identifier	1.1.	Identifier
1.2.	Title	1.1.1.	Catalog
1.3.	CatalogEntry	1.1.2.	Entry
1.3.1.	Catalog	1.2.	Title
1.3.2.	Entry	1.3.	Language
1.4.	Language	1.4.	Description
1.5.	Description	1.5.	Keyword
1.6.	Keyword	1.6.	Coverage
1.7.	Coverage	1.7.	Structure
1.8.	Structure	1.8.	Aggregation Level
1.9.	Aggregation Level		
2.	Life Cycle	2.	Life Cycle
2.1.	Version	2.1.	Version
2.2.	Status	2.2.	Status
2.3.	Contribute	2.3.	Contribute
2.3.1.	Role	2.3.1.	Role
2.3.2.	Entity	2.3.2.	Entity
2.3.3.	Date	2.3.3.	Date
3.	Meta-MetaData	3.	Meta-MetaData
3.1.	Identifier	3.1.	Identifier
3.2.	CatalogEntry	3.1.1.	Catalog
3.2.1.	Catalog	3.1.2.	Entry
3.2.2.	Entry	3.2.	Contribute
3.3.	Contribute	3.2.1.	Role
3.3.1.	Role	3.2.2.	Entity
3.3.2.	Entity	3.2.3.	Date
3.3.3.	Date	3.3.	Metadata Scheme
3.4.	Metadata Scheme	3.4.	Language
3.5.	Language		
4.	Technical	4.	Technical
4.1.	Format	4.1.	Format
4.2.	Size	4.2.	Size
4.3.	Location	4.3.	Location
4.4.	Requirement	4.4.	Requirement
4.4.1.	Type	4.4.1.	OrComponent
4.4.2.	Name	4.4.1.1.	Type
4.4.3.	Minimum Version	4.4.1.2.	Name
4.4.4.	Maximum Version	4.4.1.3.	Minimum Version
4.5.	Installation Remarks	4.4.1.4.	Maximum Version
4.6.	Other Platform Requirements	4.5.	Installation Remarks
4.7.	Duration	4.6.	Other Platform Requirements
5.	Educational	4.7.	Duration
5.1.	Interactivity Type	5.	Educational
5.2.	Learning Resource Type	5.1.	Interactivity Type
5.3.	Interactivity Level	5.2.	Learning Resource Type
5.4.	Semantic Density	5.3.	Interactivity Level
5.5.	Intended End User Role	5.4.	Semantic Density
5.6.	Context	5.5.	Intended End User Role
5.7.	Typical Age Range	5.6.	Context
5.8.	Difficulty	5.7.	Typical Age Range
5.9.	Typical Learning Time	5.8.	Difficulty
5.10.	Description	5.9.	Typical Learning Time
5.11.	Language	5.10.	Description
6.	Rights	5.11.	Language
6.1.	Cost	6.	Rights
6.2.	Copyright and Other Restrictions	6.1.	Cost
6.3.	Description	6.2.	Copyright and Other Restrictions
7.	Relation	6.3.	Description
7.1.	Kind	7.	Relation
7.2.	Resource	7.1.	Kind
7.2.1.	Identifier	7.2.	Resource
7.2.2.	Description	7.2.1.	Identifier
7.2.3.	CatalogEntry	7.2.1.1.	Catalog
7.2.3.1.	Catalog	7.2.1.2.	Entry
7.2.3.2.	Entry	7.2.2.	Description
8.	Annotation	8.	Annotation
8.1.	Person	8.1.	Entity
8.2.	Date	8.2.	Date
8.3.	Description	8.3.	Description
9.	Classification	9.	Classification
9.1.	Purpose	9.1.	Purpose
9.2.	Taxon Path	9.2.	Taxon Path
9.2.1.	Source	9.2.1.	Source
9.2.2.	Taxon	9.2.2.	Taxon
9.2.2.1.	Id	9.2.2.1.	Id
9.2.2.2.	Entry	9.2.2.2.	Entry
9.3.	Description	9.3.	Description
9.4.	Keyword	9.4.	Keyword

Changes from version 6.1 to Final Draft of IEEE LTSC Learning Object Metadata	
Previous Working Draft v6.1	Final Draft LOM v1.0
<i>p. ii</i>	Added extra Participants.
<i>p. iii</i>	Updated URL for Dublin Core
<i>p. 5</i>	Update Scope and Purpose, as per revised PAR
<i>p. 5</i>	Completed References
<i>p. 6</i> Definition <b>Extended data element:</b> Not defined	Definition <b>Extended data element:</b> An element of a data structure that is defined outside a standard and is permitted within an instance of the data structure.
<i>p. 6</i> Definition <b>Learning Object:</b> Not defined	Definition <b>Learning Object:</b> For this standard, a learning object is defined as any entity, digital or non-digital, that may be used for learning, education, or training.
<i>p. 7, clause 4.2</i>	<i>Added:</i>  The LOM data model is a hierarchy of data elements, including aggregate data elements and simple data elements (leaf nodes of the hierarchy). In the LOMv1.0 Base Schema, only leaf nodes have individual values defined through their associated value space and datatype. Aggregates in the LOMv1.0 Base Schema do not have individual values. Consequently, they have no value space or datatype
<i>p.7, clause 4.2: Changed</i>  <i>data type:</i> a set of distinct values;	<i>To:</i>  datatype: indicates whether the values are LangString (clause 7), DateTime (clause 8), Duration (clause 9), Vocabulary (clause 10), CharacterString or Undefined.

Previous Working Draft v6.1	Final Draft LOM v1.0
<p><i>p.7, clause 4.2: Changed</i></p> <p>Some data elements contain sub-elements. Data elements with sub-elements shall not have values directly; only data elements with no sub-elements shall have values directly. Data elements with sub-elements shall have values indirectly only, through their sub-elements. As an example, 7.2:Relation.Resource has a value indirectly only, through <a href="#">7.2.1:Relation.Resource.Identifier</a>, <a href="#">7.2.2:Relation.Resource.Description</a> and <a href="#">7.2.3:Relation.Resource.CatalogEntry</a>. The latter data element in turn contains sub-elements, and thus has a value indirectly only, through 7.2.3.1:Relation.Resource.CatalogEntry.Catalog and 7.2.3.2:Relation.Resource.CatalogEntry.Entry only. (See clause 4.3 for the interpretation of data elements with sub-elements that have list values.</p>	<p><i>To:</i></p> <p>Extensions to the LOMv1.0 Base Schema shall retain the value space and datatype of data elements from the LOMv1.0 Base Schema. Extensions shall not define datatypes or value spaces for aggregate data elements in the LOMv1.0 Base Schema.</p> <p>The numbering schema of the data elements represents an aggregation hierarchy of data elements and their components. As an example, the aggregate data element 7.2:Relation.Resource has two components, 7.2.1:Relation.Resource.Identifier and 7.2.2:Relation.Resource.Description. The former data element is in turn an aggregate, as it contains components: 7.2.1.1:Relation.Resource.Identifier.Catalog and 7.2.1.2:Relation.Resource.Identifier.Entry. (See clause 4.3 for the interpretation of aggregate data elements that have list values.)</p> <p>All data elements are optional: this means that a conforming LOM instance may include values for any data element defined in clause 6. As the LOMv1.0 Base Schema in clause 6 imposes an aggregation relationship, components can by definition only be present in a LOM instance as a component of the aggregate element to which they belong. As an example, 7.2.1:Relation.Resource.Identifier appears by definition as a component of 7.2:Relation.Resource. In that sense, the presence of the component implies automatically the presence of the aggregate element to which the component belongs.</p>
<p><i>p.8, clause 4.3</i></p> <p>A list of values shall contain at least one value. Implementations may use a list of zero length for internal operations, but a zero length list value shall not be distinguishable from no value. Where a value is intended to be present in an implementation, a zero-length list shall not be valid as a final value.</p>	<p><i>Removed</i></p>
<p><i>p.8, clause 4.4</i></p> <p>The value of data elements with associated vocabularies shall be represented as a (source, value) pair.</p> <ul style="list-style-type: none"> <li>❑ If the source is "LOMv1.0", then the value shall be contained in the vocabulary.</li> <li>❑ If the source is not "LOMv1.0", then the value should not be contained in the vocabulary.</li> </ul>	<p><i>Changed to:</i></p> <p>If the source is "LOMv1.0", then the value space is described by this edition of this Standard.</p>

Previous Working Draft v6.1	Final Draft LOM v1.0
<p><i>p.9, clause 4.7</i></p> <p>For each of the data elements, the specification includes the data type from which it derives its values, such as LangString or Date, etc. These will be defined separately, and will be implemented in a particular way in a particular system. In order to maximize interoperability, future work may define a common representation for these data types. In the absence of such a common representation, an exchange format, such as XML, would allow systems with different representations to achieve interoperability through a conversion process.</p>	<p><i>Changed to:</i></p> <p>For each data element, the specification includes the datatype (e.g., LangString, DateTime, etc.) of its values.</p> <p>This Standard does not define tokens for element names or vocabulary values. It is expected that such tokens will be defined in bindings of this Standard.</p> <p>Within the LOMv1.0 Base Schema, the ordering of the categories and the data elements within the categories and subcategories is informational. An instance of the LOMv1.0 Base Schema shall preserve the nesting of categories and subcategories, but the instance need not order the categories or the subitems within a category or subcategory. For example, category 5:Educational may appear before category 1:General, and within category General, Item 1.3:General.Language may appear before item 1.2:General.Title.</p>
<p><i>p.9 clause 5</i></p> <p>A strictly conforming LOM metadata instance shall consist solely of LOM data elements. A conforming LOM metadata instance may contain extension data elements. Extension data elements shall not replace data elements in the LOM structure. NOTE--All data elements in the metadata instance should describe characteristics as defined by this standard.</p> <p>(For example, the user shall not abuse the title data element to describe the fonts used in the document.) Abusing data elements would compromise semantic interoperability.</p> <p>NOTE--An organization/application can allow extensions and refer to LOM conformance in addition to conformance to something else.</p>	<p><i>Changed to:</i></p> <ul style="list-style-type: none"> <li>• A strictly conforming LOM metadata instance shall consist solely of LOM data elements.</li> <li>• A conforming LOM metadata instance may contain extended data elements.</li> <li>• A LOM instance that contains no value for any of the LOM data elements is a conforming instance.</li> </ul> <p>In order to maximize semantic interoperability, extended data elements should not replace data elements in the LOM structure. This means that an organization should not introduce new data elements of its own that replace LOM data elements. As an example, an organization should not introduce a new data element "name" that would replace 1.2:General.Title.</p> <p>NOTE:--In order to maximize semantic interoperability, users of this Standard are encouraged to carefully map their metadata information to the data elements of this Standard. For example, the user should not map an element to describe the fonts used in the document to the data element 1.2:General.Title</p>

Previous Working Draft v6.1	Final Draft LOM v1.0
<p>Tagging Practice  <b>DateTime:</b> Exists, only format shown is YYYY-MM-DD, any practice allowed in ISO 8601 is allowed.</p>	<p>Tagging Practice  <b>DateTime:</b> Exists, format based on ISO 8601:2000. Old format is also allowed.                       Use:                      [YYYY][-MM[-DD[Thh[:mm[:ss[.s[TZD]]]]]]]]                       Where:                      YYYY = four digit year (&gt;= 0001)                      MM = two-digit month (01 – 12 where 01 is January , etc)                      DD = two-digit day(01 – 31 depending on value of month and year)                      hh = two digits of hour (00 through 23)(am/pm NOT allowed)                      mm = two digits of minute (00 through 59)                      ss = two digits of second (00 through 59)                      s = one or more digits representing a decimal fraction of a second                      TZD = time zone designator (“Z” for UTC +hh:mm or –hh:mm)</p>
<p>Tagging Practice  <b>Duration:</b> Does not exist.</p>	<p>Tagging Practice  <b>Duration:</b> Exists, format based on ISO 8601:2000.                       Use:                      P[yY][mM][dD][T[hH][nM][s[.s]S]]                       Where:                      y = number of years (integer, &gt;0, not restricted)                      m = number of months (integer, &gt;0, not restricted, e.g., &gt; 11 is acceptable)                      d = number of days (integer, &gt;0, not restricted, e.g., &gt; 31 is acceptable)                      h = number of hours (integer, &gt;0, not restricted, e.g., &gt; 23 is acceptable)                      n = number of minutes (integer, &gt;0, not restricted, e.g., &gt; 59 is acceptable)                      s = number of seconds (integer, &gt;0, not restricted, e.g., &gt; 59 is acceptable)                       The character literal designators “Y”, “M”, “D”, “H”, “M”, and “S” must appear if the corresponding non-zero value is present. Otherwise, if the corresponding value is zero, it may be omitted                       “P” must always appear, and “T” can only be eliminated if h, n, and s are all = 0(time is in years, months, and days only).</p>
<p>Meta-data Information Model Element:  <b>1.1 Identifier:</b> RESERVED</p>	<p>Meta-data Information Model Element:  <b>1.1 Identifier:</b> Now has a smallest permitted maximum of 10. Now contains sub-elements  <b>1.1.1 Catalog and 1.1.2 Entry</b></p>
<p>Meta-data Information Model Element:  <b>1.3 CatalogEntry:</b> Existed</p>	<p>Meta-data Information Model Element:  <b>1.3 CatalogEntry:</b> Eliminated. Its sub-elements have been moved into <b>1.1 Identifier</b>.</p>

Previous Working Draft v6.1	Final Draft LOM v1.0
Meta-data Information Model Element: <b>1.3.1 Catalog:</b> Described as “The name of the catalog (i.e. listing identification system).”	Meta-data Information Model Element: <b>1.3.1 Catalog:</b> Moved to <b>1.1.1 Catalog</b> . New Description is “The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.”
Meta-data Information Model Element: <b>1.3.2 Entry:</b> Described as “Actual string value of the entry within the catalog (i.e. listing identification system).”	Meta-data Information Model Element: <b>1.3.2 Entry:</b> Moved to <b>1.1.2 Entry</b> . New Description is “The value of the identifier within the identification or cataloging scheme that designates or identifies this learning object. A namespace specific string.”
Meta-data Information Model Element: <b>1.4 Language:</b> Existed	Meta-data Information Model Element: <b>1.4 Language:</b> Moved. It is now <b>1.3 Language</b> . If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>1.5 Description:</b> Existed	Meta-data Information Model Element: <b>1.5 Description:</b> Moved. It is now <b>1.4 Description</b> . If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>1.6 Keywords:</b> Existed	Meta-data Information Model Element: <b>1.6 Keywords:</b> Moved. It is now <b>1.5 Keyword</b> . If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>1.7 Coverage:</b> Existed	Meta-data Information Model Element: <b>1.7 Coverage:</b> Moved. It is now <b>1.6 Coverage</b> . If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>1.8 Structure:</b> Existed	Meta-data Information Model Element: <b>1.8 Structure:</b> Moved. It is now <b>1.7 Structure</b> . If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme. Changed vocabulary to atomic, collection, networked, hierarchical, linear
Meta-data Information Model Element: <b>1.9 AggregationLevel:</b> Existed	Meta-data Information Model Element: <b>1.9 AggregationLevel:</b> Moved. It is now <b>1.8 AggregationLevel</b> . If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>2.3.2 Entity:</b> Existed. Vcard not specific.	Meta-data Information Model Element: <b>2.3.2 Entity:</b> Vcard becomes more specific. Link for information: <a href="http://www.ietf.org/rfc/rfc2426.txt">http://www.ietf.org/rfc/rfc2426.txt</a>

**Comment:** The entries on 1.3-1.9 are all basically the same comment. Maybe better to regroup as one comment? (Might look rather worrying at first sight if one doesn't realize this is just the consequence of subsuming CatalogEntry under Identifier.)

Previous Working Draft v6.1	Final Draft LOM v1.0
Meta-data Information Model Element: <b>2.3.3 Date:</b> Existed.	Meta-data Information Model Element: <b>2.3.3 Date:</b> DataType Change, Observe DateTime change above.
Meta-data Information Model Element: <b>3.1 Identifier:</b> RESERVED	Meta-data Information Model Element: <b>3.1 Identifier:</b> Now has a smallest permitted maximum of 10. Now contains sub-elements <b>3.1.1 Catalog</b> and <b>3.1.2 Entry</b>
Meta-data Information Model Element: <b>3.2 CatalogEntry:</b> Existed	Meta-data Information Model Element: <b>3.2 CatalogEntry:</b> Eliminated. Its sub-elements have been moved into <b>3.1 Identifier</b> .
Meta-data Information Model Element: <b>3.2.1 Catalog:</b> Described as “The name of the catalog (i.e. listing identification system).”	Meta-data Information Model Element: <b>3.2.1 Catalog:</b> Moved to <b>3.1.1 Catalog</b> . New Description is “The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.”
Meta-data Information Model Element: <b>3.2.2 Entry:</b> Described as “Actual string value of the entry within the catalog (i.e. listing identification system).”	Meta-data Information Model Element: <b>3.2.2 Entry:</b> Moved to <b>3.1.2 Entry</b> . New Description is “The value of the identifier within the identification or cataloging scheme that designates or identifies this learning object. A namespace specific string.”
Meta-data Information Model Element: <b>3.2.3 Date:</b> Existed.	Meta-data Information Model Element: <b>3.2.3 Date:</b> DataType Change, Observe DateTime change above.
Meta-data Information Model Element: <b>3.3 Contribute</b> (and all of its sub-elements): Existed	Meta-data Information Model Element: <b>3.3 Contribute</b> (and all of its sub-elements): Moved. It is now <b>3.2 Contribute</b> (sub-elements follow as before). If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>3.3.2 Contribute</b> Existed. Vcard not specific.	Meta-data Information Model Element: <b>3.3.2 Entity:</b> Vcard becomes more specific. Link for information: <a href="http://www.ietf.org/rfc/rfc2426.txt">http://www.ietf.org/rfc/rfc2426.txt</a>
Meta-data Information Model Element: <b>3.4 Metadatascheme:</b> Existed	Meta-data Information Model Element: <b>3.4 Metadatascheme:</b> Moved. It is now <b>3.3 Metadatascheme</b> If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.
Meta-data Information Model Element: <b>3.5 Language:</b> Existed	Meta-data Information Model Element: <b>3.5 Language:</b> Moved. It is now <b>3.4 Language</b> If all structural changes are done, it will not effect metadata structure or ordering, only the numbering scheme.

Previous Working Draft v6.1	Final Draft LOM v1.0
Meta-data Information Model Element: <b>OrComposite</b> : Did Not Exist	Meta-data Information Model Element: <b>OrComposite</b> : Created. It is now <b>4.4.1 OrComposite</b> . All children of <b>4.4 Requirements</b> are moved inside of <b>4.4.1 OrComposite</b> . Description: Grouping of multiple requirements. The composite requirement is satisfied when one of the component requirements is satisfied, e.g., the logical connector is OR.  Smallest Permitted Maximum: 40
Meta-data Information Model Element: <b>4.4.1 Type</b> : Existed	Meta-data Information Model Element: <b>4.4.1 Type</b> : Moved. It is now <b>4.4.1.1 Type</b>
Meta-data Information Model Element: <b>4.4.2 Name</b> : Existed	Meta-data Information Model Element: <b>4.4.2 Name</b> : Moved. It is now <b>4.4.1.2 Name</b>
Meta-data Information Model Element: <b>4.4.3 MinimumVersion</b> : Existed	Meta-data Information Model Element: <b>4.4.3 MinimumVersion</b> : Moved. It is now <b>4.4.1.3 MinimumVersion</b>
Meta-data Information Model Element: <b>4.4.4 MaximumVersion</b> : Existed	Meta-data Information Model Element: <b>4.4.4 MaximumVersion</b> : Moved. It is now <b>4.4.1.4 MaximumVersion</b>
Meta-data Information Model Element: <b>4.7 Duration</b> : DataType is Date	Meta-data Information Model Element: <b>4.7 Duration</b> : DataType Change. Type is now Duration. Observe Duration change above
Meta-data Information Model Element: <b>5.1 Interactivity Type</b>	Removed Undefined from Value Space
Meta-data Information Model Element: <b>5.2 Learning Resource Type</b>	Added lecture to Value Space
Meta-data Information Model Element: <b>5.4 Semantic Density</b>	Added elaborate examples
Meta-data Information Model Element: <b>5.6 Context</b>	Restricted vocabulary to school, higher education, training, other.
Meta-data Information Model Element: <b>5.9 TypicalLearningTime</b> : DataType is Date	Meta-data Information Model Element: <b>5.9 TypicalLearningTime</b> : DataType Change. Type is now Duration. Observe Duration change above
Meta-data Information Model Element: <b>7.2.1 Identifier</b> : RESERVED	Meta-data Information Model Element: <b>7.2.1 Identifier</b> : Now has a smallest permitted maximum of 10. Now contains sub-elements <b>7.2.1.1 Catalog</b> and <b>7.2.1.2 Entry</b>
Meta-data Information Model Element: <b>7.2.3 CatalogEntry</b> : Existed	Meta-data Information Model Element: <b>7.2.3 CatalogEntry</b> : Eliminated. Its sub-elements have been moved into <b>7.2.1 Identifier</b> .

Previous Working Draft v6.1	Final Draft LOM v1.0
Meta-data Information Model Element: <b>7.2.3.1 Catalog:</b> Described as “The name of the catalog (i.e. listing identification system).”	Meta-data Information Model Element: <b>7.2.3.1 Catalog:</b> Moved to <b>7.2.1.1 Catalog</b> . New Description is “The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.”
Meta-data Information Model Element: <b>7.2.3.2 Entry:</b> Described as “Actual string value of the entry within the catalog (i.e. listing identification system).”	Meta-data Information Model Element: <b>7.2.3.2 Entry:</b> Moved to <b>7.2.1.2 Entry</b> . New Description is “The value of the identifier within the identification or cataloging scheme that designates or identifies this learning object. A namespace specific string.”
Meta-data Information Model Element: <b>8.1 Person:</b> Existed. Vcard not specific.	Meta-data Information Model Element: <b>8.1 Entity:</b> Vcard becomes more specific. Link for information: <a href="http://www.ietf.org/rfc/rfc2426.txt">http://www.ietf.org/rfc/rfc2426.txt</a>
Meta-data Information Model Element: <b>8.2 Date:</b> Existed	Meta-data Information Model Element: <b>8.2. Date:</b> DataType Change, Observe DateTime change above.
Meta-data Information Model Element: <b>9. 1 Purpose:</b> Existed	Added competency to vocabulary