

VIUS Reports 5.3

Initial Plan for Data Element Definitions

The following is a complete list of data elements originally planned for the VIUS Project database. It represents a merged superset of the Dublin Core, VRA Core, and IEEE Learning Objects Model standards. We believe that the list provides an element that corresponds to each element in each of these sets, but merges those that are truly equivalent.

Our proposed list makes extensive use of qualifiers to specify various attributes of a data element, such as whether it is in a standard *format*, whether the data is taken from a particular controlled vocabulary (*source*) or whether the data element is of a particular *type* or sub-category. In most cases, a default value for the qualifier has been indicated by an asterisk.

In the case of both Dublin Core and VRA, there is no hierarchical relationship between data elements. The IEEE Learning Objects Model, on the other hand, is profoundly hierarchical. These elements are found towards the end of our list. The definitions of these elements indicate their position in the hierarchy (*Subelement of, Has Subelements*). The last page gives a different view of one of the hierarchies, showing how it might be expressed in XML notation.

For each data element, we have attempted a preliminary recommendation on whether the element is repeatable. In the case of subordinate elements within a hierarchy, repeatability means within the superior element. For example, the top-level element *Educational* is repeatable, but its subordinate element *Context* is not repeatable within that element; in order to give more than one instance of *Context*, the *Educational* element must be repeated.

We have made a recommendation concerning optionality (M for Mandatory, O for Optional); we have been very conservative about recommending mandatory elements. Only the record control number and the title are specified as Mandatory. In our cataloging guidelines, on the other hand, we may decide to require that additional elements always be provided. That is not the same as making them Mandatory in the database definition.

The field content specification is very drafty at this point. Almost everything is defined as a character string and the maximum length recommendations are best guesses.

The final column indicates whether the data content is controlled. In some cases, this is an absolute control; our definitions give an exhaustive list of possible values. In most cases, however, such as names of persons (*Creator, Contributor, Publisher*), it means that the data might be selected from an external authorized list. In such cases, this column usually says "May be" to indicate that the content may be controlled in this way, but that it might not *always* be controlled. Data elements that might be from a controlled vocabulary should have a *source* qualifier; *source=unspecified* would indicate that the data in a particular instance is not controlled.

John Attig, Annie Copeland, Michael Pelikan
Spring, 2002

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Control Number System-assigned unique number which identifies the metadata record within the system.</p>	none	No	M	—	System-assigned
<p>ID Number The unique identifiers assigned to a work or image.</p>	<p>format URI [??] unspecified*</p> <p>type current repository former repository current accession former accession unspecified*</p>	Yes	O	string; 255 char. max.	No
<p>Record Type [VRA] “Identifies the record as being either a <i>work</i> record (for the physical or created object) or an <i>image</i> record (for the visual surrogates of such objects.” Values: work image unspecified*</p>	none	No	O	string; 16 char. max.	Yes

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Title Title or identifying phrase; caption <i>Title type=series, larger entity: Cf. Relation type=part of, etc.</i>	type variant translation series larger entity unspecified*	Yes	M	string; 255 char. max.	No
File Format The storage format of the image file, e.g., gif, tiff “The physical or digital manifestation of the resource” [DC]	format IMT* unspecified	No	O	string; 80 char. max.	Yes
File Size The size of the image file in bits of data.	none	No	O	string; 16 char. max.	No
Color Depth E.g., 8 bit, 24 bit	none	No	O	string; 16 char. max.	Yes?
Compression Compressed or uncompressed, type of compression used	none	No	O	string; 80 char. max.	Yes?
Scanning Note Technical notes on the process by which the image was created, including, name of person responsible, date of scanning, hardware and software used, alterations performed	none	No	O	string; 255 char. max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Dimensions</p> <p>The size of the work or image in inches, pixels, etc. The unit of measure is included in the data, e.g., 360 x 250 pixels</p>	none	No	O	string; 80 char. max.	No
<p>Resolution</p> <p>The image resolution in dpi.</p>	none	No	O	string; 16 char. max.	No
<p>Duration</p> <p>The running time of a video work in hours, minutes and seconds.</p> <p>Example (ISO): 01:30:00</p>	<p>format ISO unspecified*</p>	No	O	string; 16 char. max.	No
<p>Material</p> <p>The substance of which a work or image is composed; more usually separated into Medium and Support.</p>	<p>source aat lsh unspecified*</p>	Yes	O	string; 255 char. max.	No
<p>Medium [VRA Material.Medium]</p> <p>“The substance of which a work or image is composed.” [VRA]</p>	<p>source aat* lsh unspecified</p>	Yes	O	string; 255 char. max.	Yes?

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Support [VRA Material.Support]</p> <p>The substance on which the medium is applied, e.g., the canvas on which an oil painting is painted</p>	<p>source aat* lcsh unspecified</p>	Yes	O	string; 255 char. max.	Maybe
<p>Creator</p> <p>The name of a person or other entity that has primary responsibility for the design, creation, production, or manufacture of the work or image. [VRA modified] “The entity primarily responsible for making the content of the resource” [DC] Other persons or entities involved in the design, production, etc., are given as <i>Contributor</i>.</p>	<p>role [values to be determined] source lcac* unspecified type personal name* corporate name</p>	Yes	O	string; 255 char. max.	Maybe
<p>Contributor [DC]</p> <p>“An entity responsible for making contributions to the content of the resource.” Primary responsibility is given as <i>Creator</i>; responsibility for publication is given as <i>Publisher</i>.</p>	<p>role [values to be determined] source lcac* unspecified type personal name* corporate name</p>	Yes	O	string; 255 char. max.	Maybe

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Publisher [DC] “An entity responsible for making the resource available.” [DC]</p>	<p>role [values to be determined] source lcaf* unspecified type personal name corporate name*</p>	Yes	O	string; 255 char. max.	Maybe
<p>Date “Date or range of dates associated with the creation, design, production, presentation, performance, construction or alteration of the work or image.” [VRA] “A date associated with an event in the life cycle of the resource.” [DC] Subelements: Beginning date; Ending date (used for a range of dates)</p>	<p>format ISO unspecified* type creation* design completion ? alteration restoration modification available issued valid</p>	Yes	O	string; 24 char. max	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Beginning Date Used for the first of a range of dates. Subordinate to: Date</p>	<p>format ISO unspecified*</p> <p>type creation* design completion ? alteration restoration modification available issued valid</p>	Yes	O	string; 24 char. max.	No
<p>Ending Date Used for the second of a range of dates. Subordinate to: Date</p>	<p>format ISO unspecified*</p> <p>type creation* design completion ? alteration restoration modification available issued valid</p>	Yes	O	string; 24 char. max.	No
<p>Subject “Terms or phrases that describe, identify, or interpret the work or image and what it depicts or expresses.” [VRA] Cf. <i>Geographic Coverage; Style or Period; Culture</i></p>	<p>source aat LCAF unspecified</p>	Yes	O	string; 255 char. max.	May be

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Relation “Terms or phrases describing the relationship between the work or image being cataloged and other works or images.” [VRA] “A reference to a related resource.” [DC] Cf. <i>Source</i> Subelement (IEEE): <i>Resource (Relation)</i></p>	<p>format URL unspecified* source LCAF unspecified* type part of* larger context for larger entity sketch for based on cartoon for model for study for plan for document for document of prototype for copy after copy of original of facsimile of version of format of references referenced by derived from source for* HasPart HasVersion HasFormat IsBasisFor Replaced IsReplacedBy Requires IsRequiredBy</p>	<p>Yes</p>	<p>O</p>	<p>string; 255 char. Max.</p>	<p>No</p>

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Resource (Relation) “Resource the relationship holds for” [IEEE] Subelement of: <i>Relation</i> Subelements: <i>Identifier (Relation), Description (Relation), CatalogEntry (Relation)</i>	none	No	O	string; 255 char. Max.	No
Identifier (Relation) “Unique identifier of the other resource” [IEEE] Subelement of: <i>Resource (Relation)</i>	none	No	O	string; 255 char. Max.	No
Description (Relation) “Description of the other resource” [IEEE] Subelement of: <i>Resource (Relation)</i>	none	No	O	string; 1000 chars. Max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
CatalogEntry (Relation) “Description (catalog entry) of the other resource” [IEEE] Subelement of: <i>Resource (Relation)</i> Subelements: <i>Catalog (Relation), Entry (Relation)</i>	none	No	O	string; 255 char. Max.	No
Catalog (Relation) “Source of the following string value” [IEEE] Subelement of: <i>CatalogEntry (Relation)</i>	none	No	O	string; 255 char. Max.	No
Entry (Relation) “Actual value” [IEEE] Subelement of: <i>CatalogEntry (Relation)</i>	none	No	O	string; 255 char. Max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Source “A reference to the source of the information recorded about the work or image.” [VRA; note that this is the source of the metadata, not the image] “A reference to a resource from which the present resource is derived.” [DC; note that this is the source of the image, not the metadata] In VRA, source of the image is given as <i>Relation type=source for ???</i></p>	<p>format URL unspecified* source LCAF unspecified*</p>	Yes	O	string; 255 char. Max.	No
<p>Language “A language of the intellectual content of the resource.” [DC]</p>	<p>for mat ISO MARC* unspecified</p>	Yes	O	string; 255 char. Max.	Yes
<p>Audience Persons or other entities for which the work or the image was intended.</p>	None	Yes	O	string; 255 char. Max.	No?

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Rights “Information about rights held in and over the resource.” [DC] “Information about rights management; may include copyright and other intellectual property statements required for use.” [VRA] “Conditions of use of the resource” [IEEE] Subelements <i>[IEEE]: Cost (Rights), CopyrightAndOtherRestrictions (Rights), Description (Rights)</i></p>	none	Yes	O	string; 255 char. Max.	No?
<p>Cost (Rights) “Whether use of the resource requires payment” [IEEE] Values: Yes No Subelement of: <i>Rights</i></p>	none	No	O	string; 8 char. Max.	Yes
<p>CopyrightAndOtherRestrictions (Rights) “Copyright or other restrictions apply” [IEEE] Values: Yes No Subelement of: <i>Rights</i></p>	none	No	O	string; 8 char. Max.	Yes

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Description (Rights) “Conditions of use of the resource” [IEEE] Subelement of: <i>Rights</i>	none	No	O	string; 1000 chars. Max.	No
Metametadata “Features of the description rather than the resource” [IEEE] Subelements: <i>Identifier (Metametadata);</i> <i>CatalogEntry (Metametadata);</i> <i>Contribute (Metametadata);</i> <i>MetadataScheme (Metametadata);</i> <i>Language (Metametadata)</i>	none	Yes	O	string; 255 char. Max.	No
Identifier (Metametadata) “A unique label for the meta-data - can be system-generated” [IEEE] Subelement of: <i>Metametadata</i>	none	Yes	O	string; 255 char. max.	No
CatalogEntry (Metametadata) “Designation given to the meta-data instance” [IEEE] Subelement of: <i>Metametadata</i> Subelements: <i>Catalog; Entry</i>	none	Yes	O	string; 255 char. max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Catalog (Metametadata) “Source of the following string value” (referring to the value in <i>entry</i> element) [IEEE] Subelement of: <i>CatalogEntry (Metametadata)</i>	none	Yes	O	string; 255 char. Max.	No
Entry (Metametadata) “Actual string value” [IEEE] Subelement of: <i>CatalogEntry (Metametadata)</i>	none	Yes	O	string; 255 char. Max.	No
Contribute (Metametadata) “Persons or organizations contributing to the meta-data” [IEEE] Subelement of: <i>Metametadata</i> Subelements: <i>Role (Metametadata); Centity (Metametadata); Date (Metametadata)</i>	none	Yes	O	string; 255 char. Max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Role (Metametadata) “Kind of contribution” [IEEE] <i>IEEE application note:</i> recommended that exactly one instance of creator exist Values: Creator Validator Subelement of: Contribute (Metametadata)	none	Yes	O	string; 10 char. max	Yes
Centity (Metametadata) “Entity or entities involved, most relevant first” [IEEE] Subelement of: Contribute (Metametadata)	none			string; 1000 char. max	No
Date (Metametadata) “Date of contribution” [IEEE] Subelement of: Contribute (Metametadata)	none	Yes	O	numeric?	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
MetadataScheme (Metametadata) “Names the structure of the meta-data, including version” [IEEE] Subelement of: <i>Metametadata</i>	none	Yes	O	string; 30 char. Max	No
Language (Metametadata) “Language of the meta-data [IEEE] Subelement of: <i>Metametadata</i>	none	Yes	O	string; 100 char. Max	No
Technical “Technical features of the learning object” [IEEE] Subelements: <i>Requirement (Technical), InstallationRemarks (Technical), OtherPlatformRequirements (Technical), Duration (Technical)</i>	none	No	O	string; 255 char. Max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Requirement (Technical) “Needs in order to access the resource” [IEEE] Subelement of: <i>Technical</i> Subelements: <i>Type (Requirement), Name (Requirement), MinimumVersion (Requirement), MaximumVersion (Requirement)</i>	none	Yes	O	string; 500 char. Max	No
Type (Requirement) “Type of requirement” [IEEE] Values: Operating system Browser Subelement of: <i>Requirement (Technical)</i>	none	No	O	string; 16 char. Max	Yes
Name (Requirement) “Name of the required item” [IEEE] Values: if Type=Operating System, then values: PC-DOS MS- Windows MacOS Unix , Multi-OS Other None; if Type=Browser then values: Any Netscape Communicator Microsoft Internet Explorer Opera if other type, then open vocabulary Subelement of: <i>Requirement (Technical)</i>	none	No	O	string; 255 char. max.	Yes

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Maximum Version (Requirement) “highest version of the required item” [IEEE] <i>Subelement of: Requirement (Technical)</i>	none	No	O	string; 30 char.	No
InstallationRemarks (Technical) “Description on how to install the resource” [IEEE] <i>Subelement of: Technical</i>	none	No	O	string; 1000 char. Max	No
OtherPlatformRequirements (Technical) “Information about other software and hardware requirements” [IEEE] <i>Subelement of: Technical</i>	none	No	O	string; 1000 char. Max	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
InteractivityType (Educational) “The type of interactivity supported by the learning object” [IEEE] Values: active expositive mixed undefined Subelement of: <i>Educational</i>	none	No	O	string; 10 char. max	Yes
LearningResourceType (Educational) “Specific kind of resource, most dominant kind first.” [IEEE] Values: Exercise Simulation Questionnaire Diagram Figure Graph Index Slide Table Narrative Text Exam Experiment ProblemStatement SelfAssesment Subelement of: <i>Educational</i>	none	Yes	O	string; 20 char. max	Yes
InteractivityLevel (Educational) “Level of interactivity between an end user and the learning object” [IEEE] Values: very low low medium high very high Subelement of: <i>Educational</i>	none	No	O	string; 10 char. max	Yes

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
SemanticDensity (Educational) “Subjective measure of the learning object’s usefulness as compared to its size or duration.” [IEEE] Values: very low low medium high very high Subelement of: Educational	none	No	O	string; 10 char. Max.	Yes
IntendedEndUserRole (Educational) “Normal user of the learning object, most dominant first” [IEEE] Values: Teacher Author Learner Manager Subelement of: Educational	none	Yes	O	string; 10 char. Max.	Yes

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Context (Educational) “The typical learning environment where use of the learning object is intended to take place” [IEEE] Values: Primary Education Secondary Education Higher Education University First Cycle University Second Cycle University Postgrade Technical School First Cycle Technical School Second Cycle Professional Formation Continuous Formation Vocational Training Subelement of: <i>Educational</i></p>	none	Yes	O	string; 30 char. max.	Yes
<p>TypicalAgeRange (Educational) “Age of the typical intended user” [IEEE] Subelement of: <i>Educational</i></p>	none	No	O	string; var.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Difficulty (Educational) “How hard it is to work through the learning object for the typical target audience.” [IEEE] Values: very easy easy medium difficult very difficult Subelement of: <i>Educational</i>	none	No	O	string; 18 char.	Yes
TypicalLearningTime (Educational) “Approximate or typical time it takes to work with the learning resource” [IEEE] Examples: 01:30:00, 00:01:45 Subelement of: <i>Educational</i>	none	No	O	Date/Time	No
Description (Educational) “Comments on how the learning object is to be used” [IEEE] Subelement of: <i>Educational</i>	none	No	O	string; 1000 char. max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Annotation Free-text field for users (both faculty and students) to add their comments on the work or image. “Comments on the educational use of the learning object” [IEEE] Subelements: <i>Person, Date, Description</i>	none	Yes	O		No
Person (Annotation) “Annotator” [IEEE] Subelement of: <i>Annotation</i>	none	No	O	string; 1000 chars. max.	No
Date (Annotation) “Date that the annotation was created” [IEEE] Subelement of: <i>Annotation</i>	none	No	O	Date	No
Description (Annotation) “The content of the annotation” [IEEE] Subelement of: <i>Annotation</i>	none	No	O	string; 1000 chars. max.	No

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Classification “Description of a characteristic of the resource by entries in classifications.” [IEEE] <i>Applications notes:</i> 1. End users can refer to their preferred classifications. 2. If <i>Purpose</i> (9.1) equals <i>Discipline</i>, then this category corresponds with the Dublin Core element <i>DC.Subject</i> Subelements: <i>Purpose</i> (Classification), <i>TaxonPath</i> (Classification), <i>Description</i> (Classification), <i>Keyword</i> (Classification)</p>	none	Yes	O	string; 255 char. Max.	
<p>Purpose (Classification) “Characteristics of the resource described by this classification entry.” [IEEE] Values: <i>Discipline</i> <i>Idea</i> <i>Prerequisite</i> <i>Educational Objective</i> <i>Accessibility Restrictions</i> <i>Educational Level</i> <i>Skill Level</i> <i>Security Level</i> Subelement of: <i>Classification</i></p>	none	No	O	string; 30 char. max.	Yes

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>TaxonPath (Classification) “A taxonomic path in a specified classification” [IEEE] <i>Applications note:</i> There may be different paths, in the same or different classifications, that describe the same characteristic. Subelement of: <i>Classification</i> Subelements: <i>Source (Classification), Taxon (Classification)</i></p>	none	No	O	string; 255 char. max.	
<p>Source (Classification) “A specific classification.” [IEEE] Any recognized “official” taxonomy, any user-defined taxonomy. A tool may provide the top-level entries of a well-established classification (LOC, UDC, DDC, etc.). Subelement of: <i>TaxonPath (Classification)</i></p>	none	No	O	string; 255 char. max.	

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
<p>Taxon (Classification) “An entry in a classification. An ordered list of Taxons creates a taxonomic path, i.e. "taxonomic stairway": this is a path from a more general to more specific entry in a classification.” [IEEE] <i>Application note:</i> A TaxonPath can have a depth from 1 to 9. Normal values are between 2 and 4. Examples: Physics/ Acoustics/ Instruments/ Stethoscope Medicine/ Diagnostics/ Instruments/ Stethoscope Subelement of: <i>TaxonPath</i> (Classification) Subelements: ID (Taxon), Entry (Taxon)</p>	none	No	O	string; 1000 chars. max.	
<p>ID (Taxon) “The Taxon’s identifier in taxonomic system” [IEEE] Subelement of: <i>Taxon</i> (Classification)</p>	none	No	O	string; 1000 chars. max.	Repertoire of ISO/IEC 10646-1

Element Description	Qualifiers	Repeatable	M/O	Field Length	Controlled
Entry (Taxon) “The Taxon’s name or label (other than identifier)” [IEEE] Subelement of: <i>Taxon</i> <i>(Classification)</i>	none	No	O	string; 500 chars. max.	
Description (Classification) “A textual description of learning object relative to its stated purpose.” [IEEE] Subelement of: <i>Classification</i>	none	No	O	string; 2000 chars. max	
Keyword (Classification) “Contains keyword description of learning objective relative to its stated purpose.” [IEEE] Subelement of: <i>Classification</i>	none	No	O	string; 1000 chars. Max.	

The Metametadata hierarchy expressed in XML: [... = data]

```
<metametadata>
  <identifier>...</identifier>
  <catalogentry>
    <catalog>...</catalog>
    <entry>...</entry>
  </catalogentry>
  <contribute>
    <role>...</role>
    <centity>...</centity>
    <date>...</date>
  </contribute>
  <metadatascheme>...</metadatascheme>
  <language>...</language>
</metametadata>
```