

International Conference on Dublin Core and Metadata Applications

DCMI-IEEE LTSC Task force

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Overview

- Two PARs
 - LOM RDF vocabulary
 - LOM mapping to the Dublin Core Abstract Model
- One goal: Mix and match between
 - Dublin Core
 - LOM
 - DC Education
 - ISO MLR
 - FOAF
 - Other Semantic Web vocabulary





RDF PAR

Title: Standard for Resource Description Framework (RDF) Vocabulary for IEEE Learning Object Metadata (LOM) Data Elements

Purpose:

There is an increasing demand for definitions of IEEE Learning Object Metadata (LOM) data element semantics which allow the expression of IEEE LOM instances in applications using Semantic Web technologies such as the Resource Description Framework (RDF). For some data elements, this expression can be achieved using existing, stable RDF vocabularies. [The purpose of this Standard is to define the semantics of data elements not covered by such vocabularies.](#) This Standard forms an important basis for making IEEE LOM useful in this larger metadata context.

Scope:

This Standard defines [a Resource Description Framework \(RDF\) vocabulary to express the semantics of data elements of the LOMv1.0 base schema](#) of IEEE Standard for Learning Object Metadata (LOM) (IEEE Std 1484-12.1-2002). The Standard makes use of modeling primitives from the RDF Vocabulary Description Language (RDF Schema) and the Dublin Core Abstract Model (DCAM). The Standard includes the specification of RDF terms, including properties, classes, vocabularies, syntax encoding schemes and vocabulary encoding schemes, covering the semantics of data elements defined in IEEE LOM. [The Standard includes the specification of URIs to use to identify the terms.](#) The Standard does not define new terms for data elements that can be appropriately expressed using sufficiently stable, existing RDF vocabularies (notably Dublin Core). This Standard does not address the construction of conforming IEEE LOM instances using RDF technology.





DCAM PAR

Title: Recommended Practice for Expressing IEEE Learning Object Metadata Instances Using the Dublin Core Abstract Model

Purpose:

There is an increasing demand for interoperable definitions of Dublin Core Metadata Initiative (DCMI) metadata terms and IEEE Learning Object Metadata (LOM) data elements which allow these to be used together in metadata instances. This Recommended Practice addresses this requirement by describing [how to use the definitions of metadata terms](#) defined by the IEEE Standard for Resource Description Framework (RDF) Vocabulary for IEEE Learning Object Metadata (LOM) Data Elements (IEEE Std 1484.12.x-200x) [and DCMI metadata terms together in Dublin Core metadata instances](#). This represents a partial and short-term solution to the overall issue of metadata interoperability in learning, education, and training contexts. The Recommended Practice also aims to inform the longer-term process of trying to align the abstract models of IEEE LOM and DCAM, as it will provide an analysis of fundamental incompatibilities between the two models.

Scope:

This Recommended Practice describes [how to construct](#) IEEE Standard for Learning Object Metadata (LOM) (IEEE Std 1484-12.1-2002) [instances using the Dublin Core Abstract Model \(DCAM\)](#). It describes how to use the definitions of metadata terms defined by the IEEE Standard for Resource Description Framework (RDF) Vocabulary for IEEE Learning Object Metadata (LOM) Data Elements (IEEE Std 1484.12.x-200x) together with DCMI metadata terms for [expressing IEEE LOM conforming instances as DCAM description sets](#). This Recommended Practice does **not** address the issue of expressing DCAM description sets or DCMI metadata terms using LOM data elements.



Publication

- Both an IEEE “Standard” and a DCMI “Recommendation”
 - Consensus in both communities
 - Both communities can contribute
 - Both communities can participate in ballot
 - If no consensus reached, none will be published
- Timing and commenting issues
 - DCMI very flexible, IEEE more rigid
 - Follow IEEE procedure, adjust DCMI schedule & process?



☼ Taskforce structure

- The taskforce consists of members of both DC-Education and IEEE LTSC.
- Membership in IEEE LTSC is not be mandatory, and the mailing list is open to anyone.
- Chairs: Mikael Nilsson & Jon Mason



Resources

- Wiki:
 - <http://dublincore.org/educationwiki/DCMIIEEEELTSCTaskforce>
- Mailing list:
 - <http://www.jiscmail.ac.uk/lists/DC-IEEEELTSC-TASKFORCE.html>
- 38 subscribers currently



Progress

- Existing documents:
 - Initial LOM-in-DCAM analysis
 - Set of classes and properties
 - Examples
- Work has been on hold waiting for
 - New version of DCAM
 - New version of DC-RDF
 - Domains & ranges for DC properties



Status

- New DCAM: Recommendation!
- New DC-RDF: Recommendation!
- DC Domains & ranges: Recommendation!
- 2 PARs approved



Workplan

- Update the documents:
 - Initial LOM-in-DCAM analysis
 - Set of classes and properties
 - Examples
- Create:
 - Dublin Core Application Profile based on LOM
 - Including Description Set Profile
 - GRDDL transformation from LOM-XML to LOM-DCAM-in-RDF



☼ Looking forward to LOMNext...

- Lesson from Task Force work:
 - **What is LOM???**
- To understand LOM, we need:
 - an Abstract Model (=elements-in-elements)
 - a set of terms (the LOM Elements)
 - a set of rules for combining them (the LOM AP)
- Which is the **real** business of LOM?





Comments?

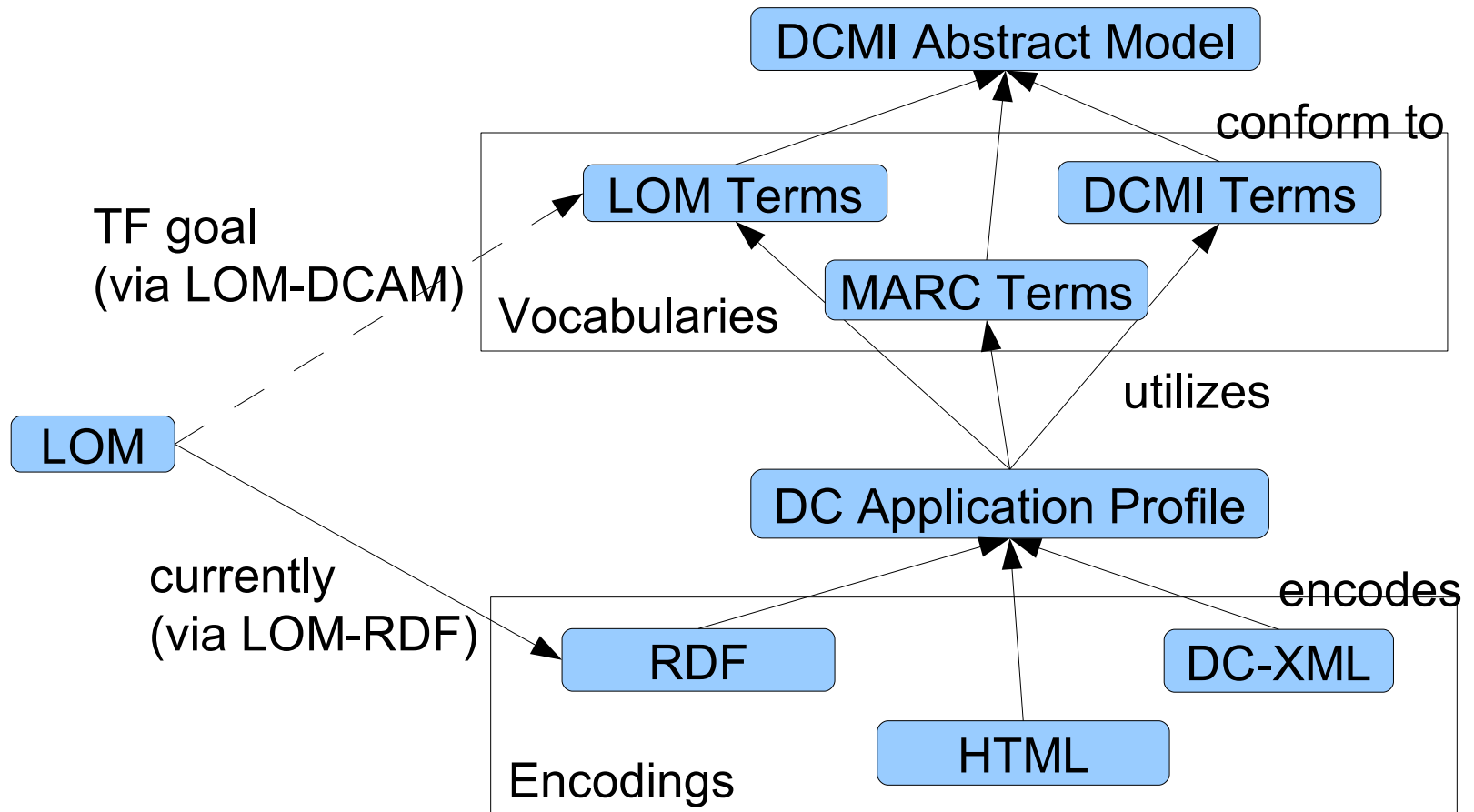


☼ Background

- LOM elements not usable in combination with DCMI elements (e.g. in Dublin Core APs)
- RDF a way to combine LOM and DC
 - First LOM/RDF draft September 2002
 - Not generalizable to other DC formats / DCAPs
- Other alternative: ad-hoc mapping
- March 2005: DCMI Abstract Model
 - => New possibilities for interoperability!



Goals



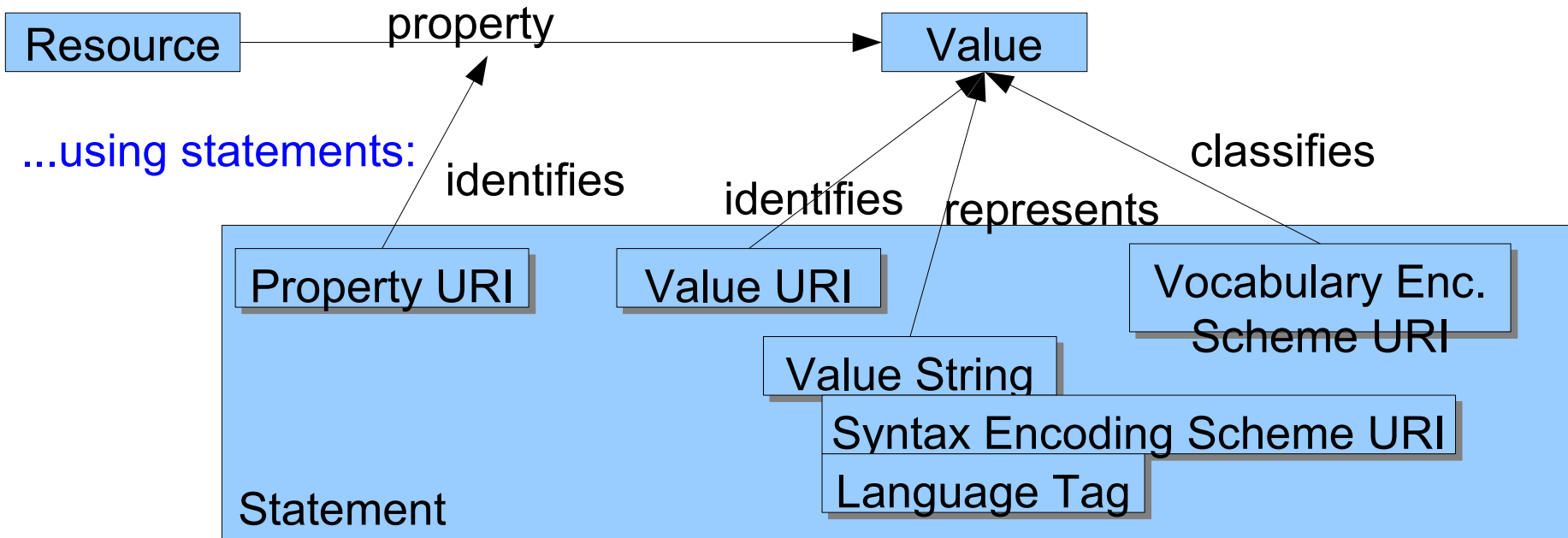
☼ DCMI Abstract Model

- DC is much more than 15 terms (>80 in fact)
- DCAM: DCMI recommendation in March 2005
- Specifies the relationship between *properties, values, encoding schemes* etc.
- High level of compatibility with the RDF model
- Used by *bindings* (XML, RDF, XHTML)
- **DCMI terms** are instances of the concepts in the DCAM
- **DCAPs** are based on the concepts in the DCAM



DCAM

DCAM describes relationships...





LOM => DCAM mapping

- Recommendation for using LOM metadata in Dublin Core descriptions
- A mapping “LOM elements” => “instances of DCAM concepts”
- **Not** a binding, but a **translation** (lossy in part)
- All constructs are used: properties, value strings, value URIs, [vocabulary|syntax] encoding schemes, related descriptions, **except rich representations**



Example

- LOM XML:

```
<lifecycle>
  <version>
    <string language="en">1.0</string>
  </version>
</lifecycle>
```

- Corresponding DCAM:

Statement:

PropertyURI:

Value String:

Language:

lom:version

“1.0”

“en”

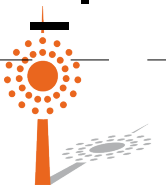
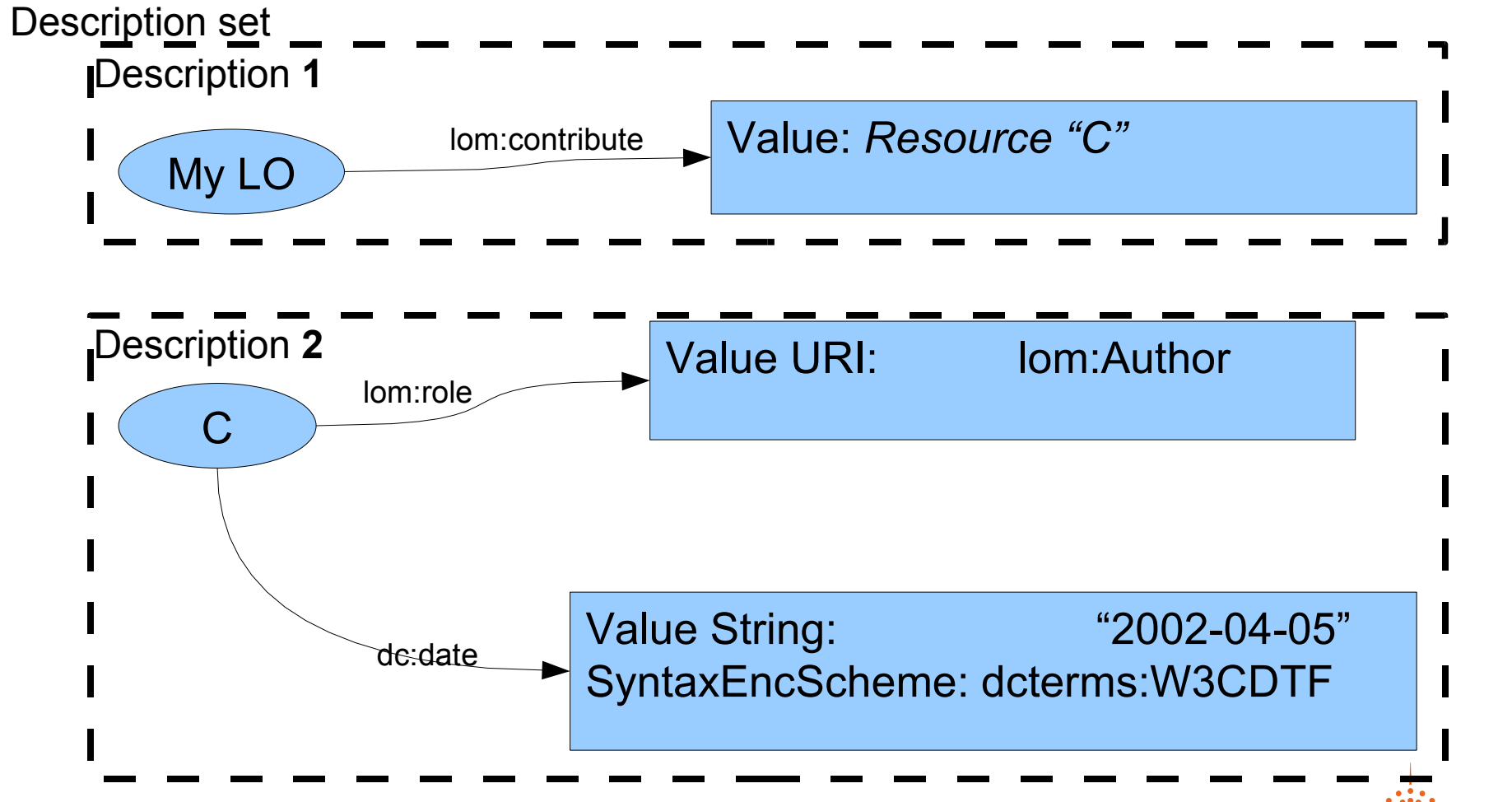


More complex example (LOM)

```
<lifecycle>
  <contribute>
    <role>
      <source>LOMv1.0</source>
      <value>author</author>
    </role>
    <date>
      <dateTime>2002-04-05</dateTime>
    </date>
  </contribute>
</lifecycle>
```



More complex DCAM example



☼ Consequences for LOM

- LOM elements reusable in DCAPs
- LOM may be viewed as a basic DCAP
- RDF binding of LOM for free
- First step towards better alignment of abstract models?
- Most work already done within LOM RDF binding
- Separates LOM=>DC translation from the specific RDF binding.





DC and RDF abstract models

- Both DC and RDF use a resource – property – value model
- DC has more high-level “values” than RDF
 - value URIs
 - value strings
 - rich values, etc.
- The LOM RDF binding uses the RDF model (of course)
- It also tries to be compatible with the DC model.

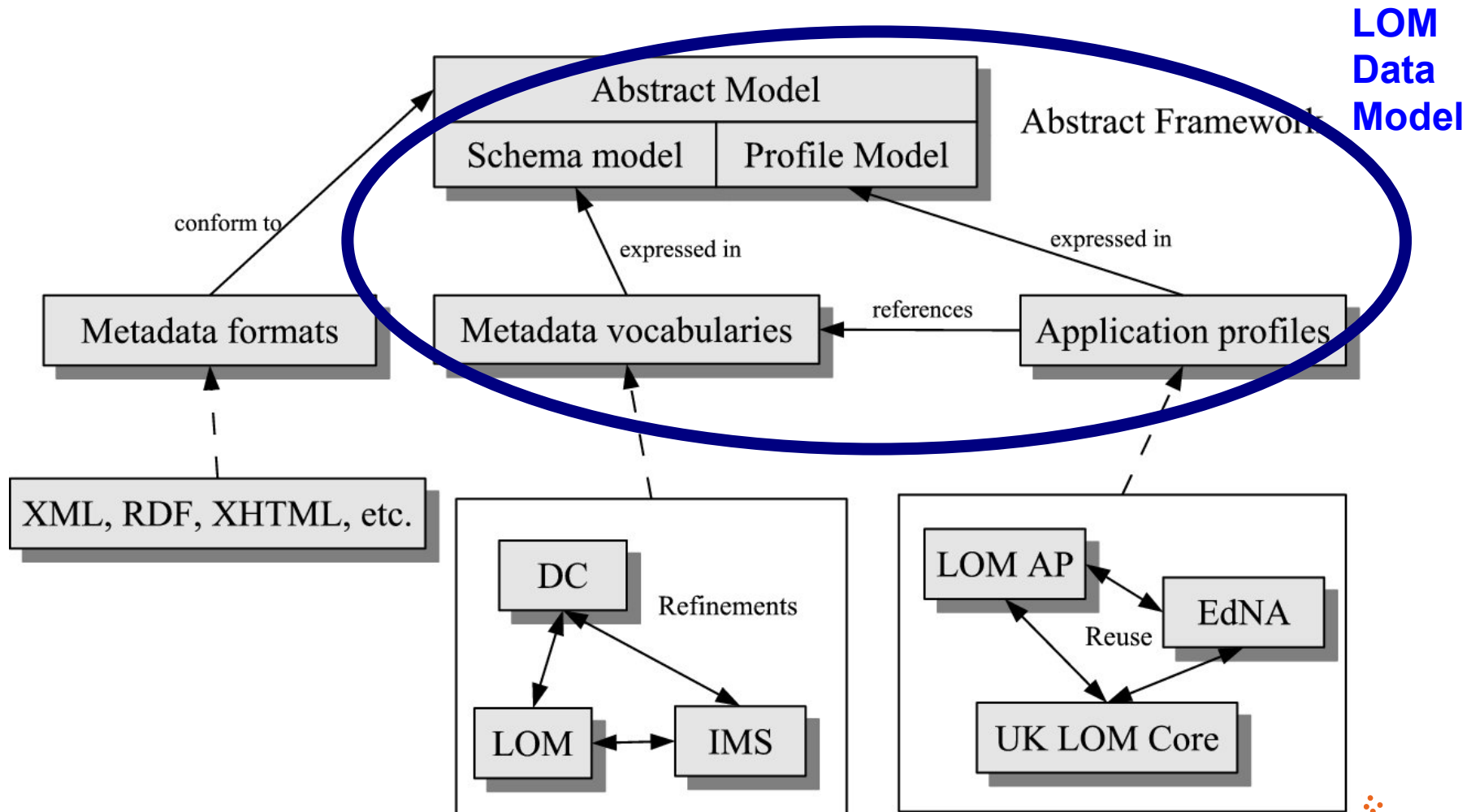


☼ Work in Progress at DCMI

- DCAM (March 2005) is leading to many changes:
 - Improved DCMI Terms definitions
 - Total remake of DC RDF expression
 - Total remake of DC XML expression
 - Shift from Terms to Model: Refocus on APs.



A High-Level view of Metadata Frameworks





Metadata Frameworks

- Dublin Core:
 - Separates Vocabulary, Model, Formats and APs
- LOM:
 - Mixes Vocabulary, Model and AP, separates Format
- ISO MLR:
 - Mixes Vocabulary, Model and AP, separates Format
- Which path to take?





Comments?

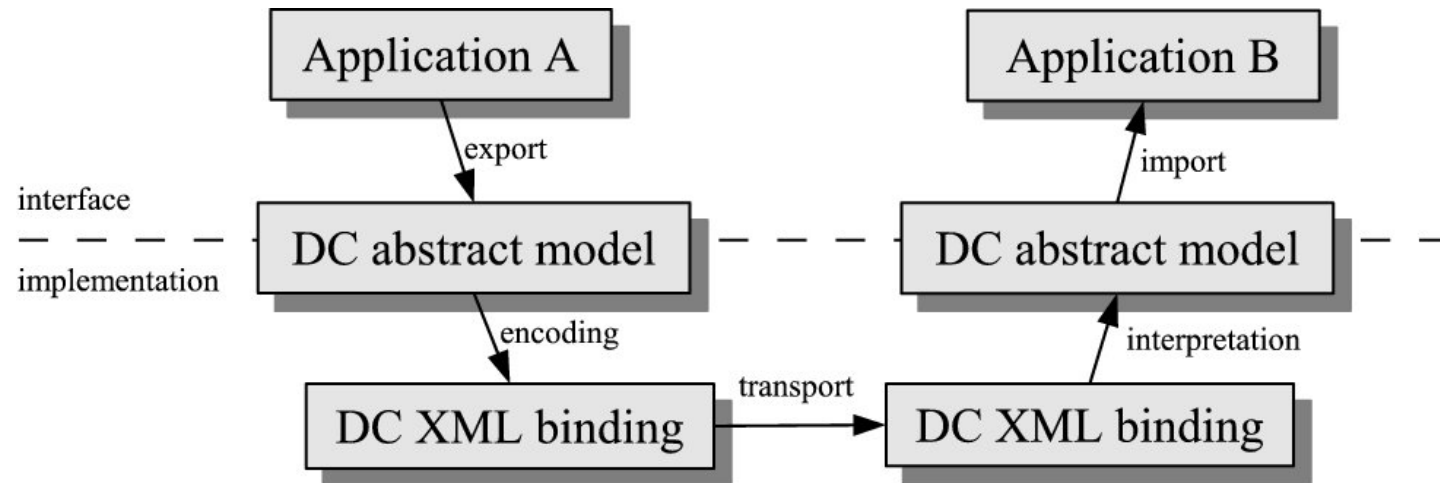


☼ Metadata Interoperability Issues

- LOM elements not usable in combination with DCMI elements (e.g. Dublin Core Aps)
- The concept of “element” differ substantially between the two standards
- Surface interoperability:
 - XML namespaces
 - RDF
- ...but the interpretation of these expressions differ

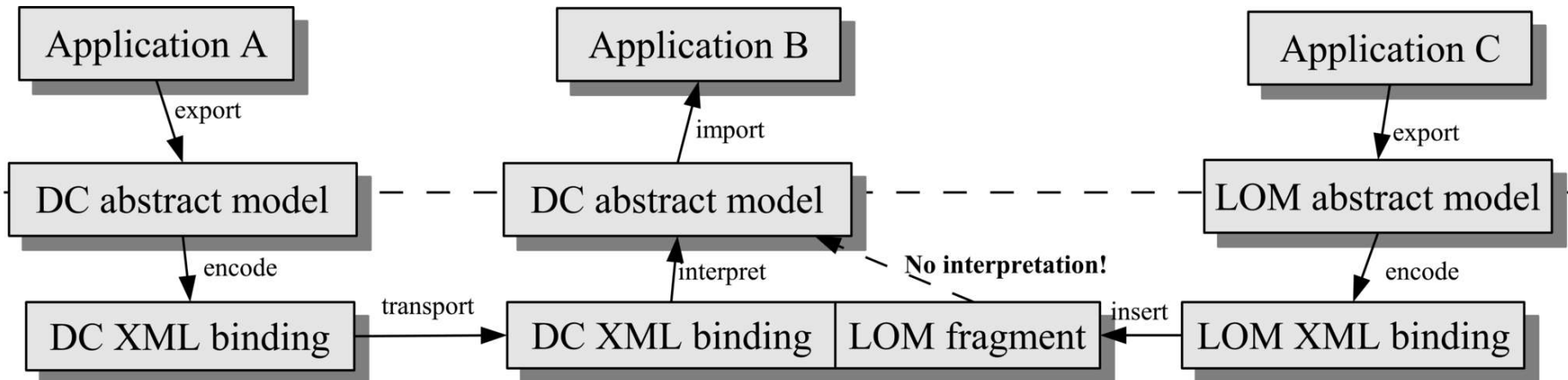


☼ Interpreting metadata



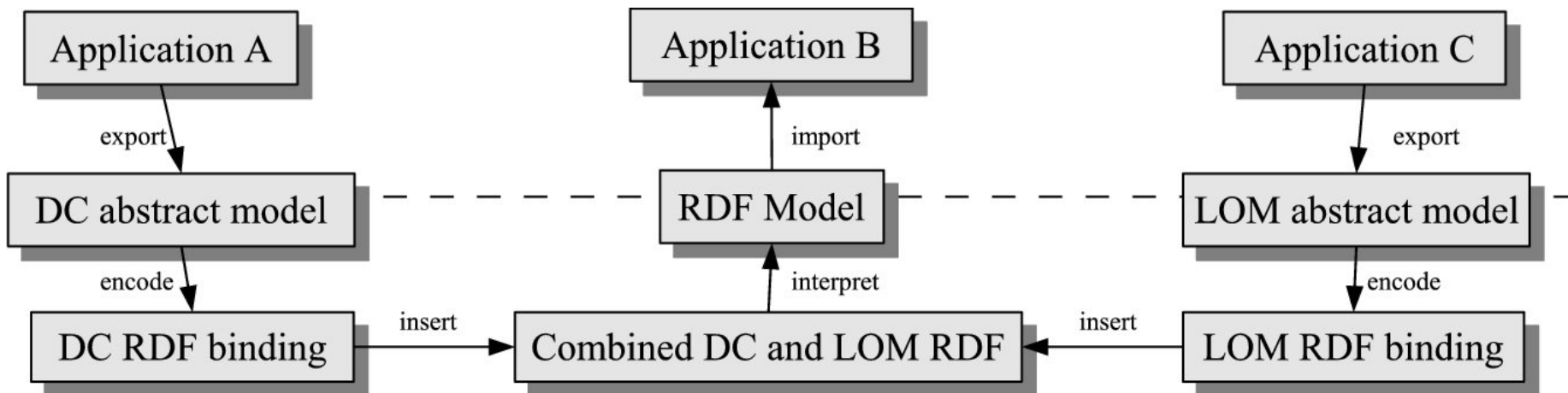


Combining XML fragments





Combining RDF fragments





Interpreting XML and RDF metadata

<i>Format</i>	<i>Extended with fragment from</i>	<i>Processable by LOM application</i>	<i>Processable by Dublin Core application</i>
LOM XML	Dublin Core XML	Only LOM part	None
Dublin Core XML	LOM XML	None	Only Dublin Core part

<i>Format</i>	<i>Processable by LOM application</i>	<i>Processable by Dublin Core application</i>	<i>Processable by RDF application</i>
LOM+Dublin Core RDF	Only LOM part	Dublin Core part + most of LOM part	Dublin Core part + LOM part





Requirements for Reusability

- The components must be unambiguously identified
- The components must adhere to compatible abstract models.
- A metadata format must be used that allows for consistent interpretation of the components with respect to their respective abstract models.

