Mapping LOM to the Dublin Core Abstract Model
– an alternative to the LOM RDF binding

Mikael Nilsson
mini@nada.kth.se

The Knowledge Management Research Group
Centre for user oriented IT design
Royal Institute of Technology, Stockholm

http://kmr.nada.kth.se

Background

- LOM elements not usable in combination with DCMI elements (e.g. Dublin Core APs)

- RDF has been the only way to combine LOM and DC

- First LOM/RDF draft September 2002

- Suffers from incompatibilities between LOM and RDF

- March 2005: Dublin Core Abstract Model

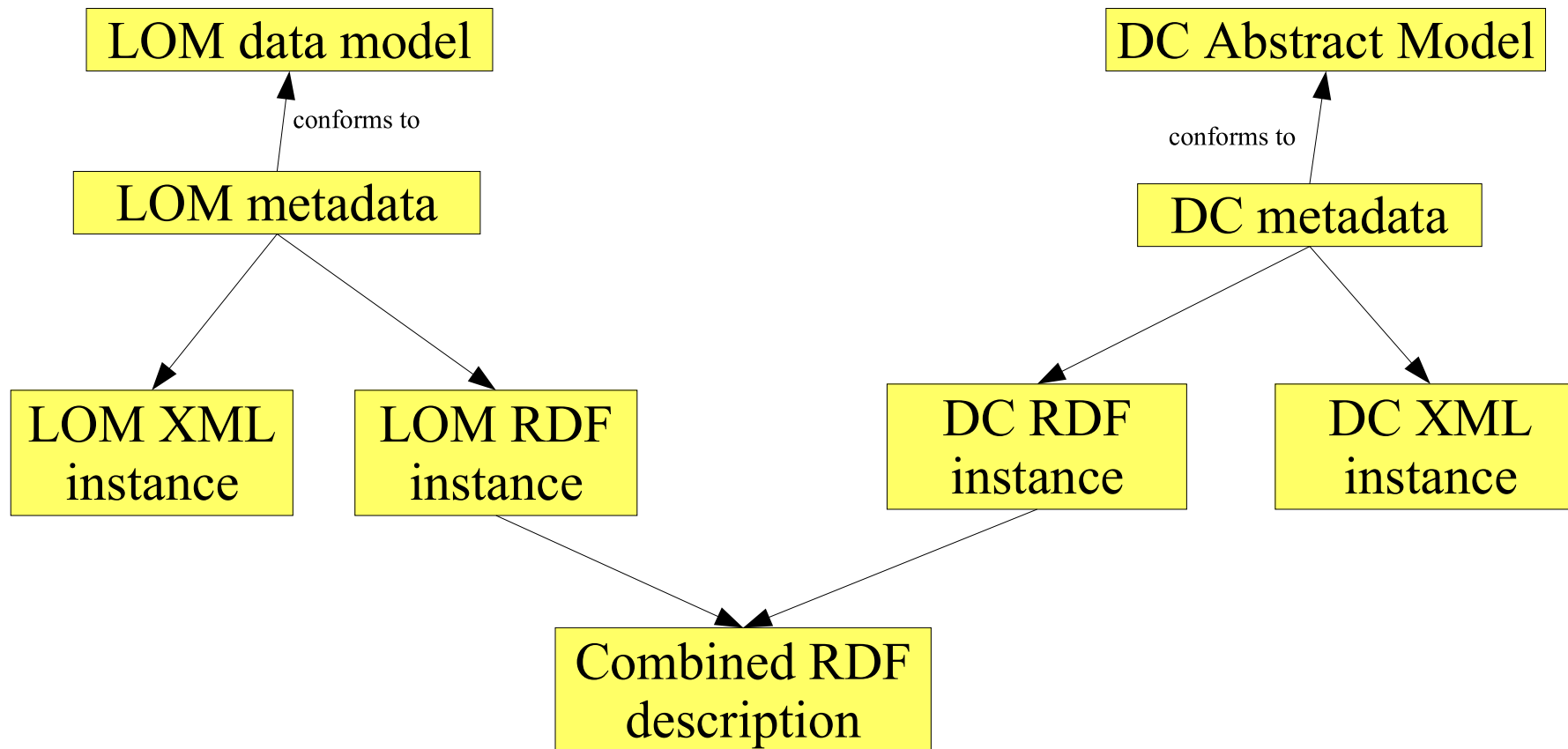 => New possibilities for interoperability!

Dublin Core Abstract Model

- 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

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LOM RDF binding

- Conceptually, the binding maps LOM to RDF in three steps:

    1. Transforms LOM into an Entity-Relationship model

    2. Defines URIs for entities and relations

    3. Expresses this model in RDF

- Step 1 & 2 essentially creates a DCAM mapping of LOM

- Step 3 very similar to the DC RDF binding

=> Make this split explicit!

Current structure

LOM data model

DC Abstract Model

conforms to

conforms to

LOM metadata

DC metadata

LOM XML instance

LOM RDF instance

DC RDF instance

DC XML instance

Combined RDF description
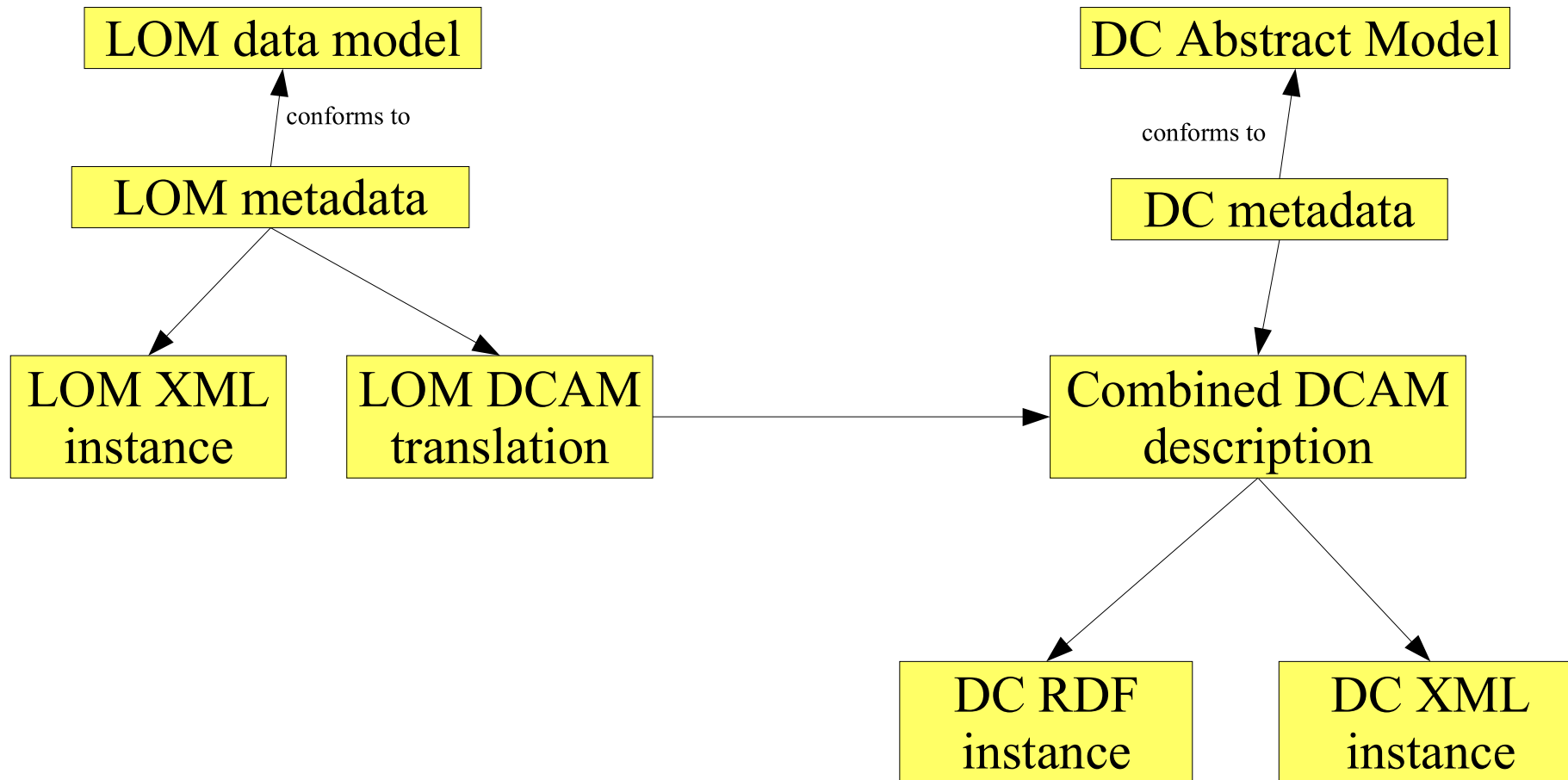
Proposal: Create LOM => DCAM adaptation

- 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

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CID

Proposed structure

LOM data model

DC Abstract Model

conforms to

conforms to

LOM metadata

DC metadata

LOM XML instance

LOM DCAM translation

Combined DCAM description

DC RDF instance

DC XML instance

Example

- LOM XML:

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

- Corresponding DCAM:

Statement:
PropertyURI:	lom:version
VocabularyEncSchURI:	lom:Version
Value String:	"1.0"
Language:	"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

Description set

Description **1**

My LO

lom:contribute →

Value: *Resource "C"*
Voc. Enc. Scheme: lom:Contribute

Description **2**

C

lom:role →

Value URI: lom:Author
Voc. Enc. Scheme: lom:Role
Value String: "author"
    SyntaxEncScheme: LOMv1.0

dc:date →

Voc. Enc. Scheme: lom:DateTime
Value String: "2002-04-05"
    SyntaxEncScheme: dcterms:W3CDTF

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.

Discussion

- Not two-way: No general way back to LOM
- Who owns it? DCMI or IEEE? Both?
- Two-step process to get from LOM to RDF
- Needs new PAR, replaces LOM RDF
- Collaboration with DCMI experts

Proposal: Joint DCMI-LTSC taskforce

- The taskforce will produce a joint DCMI/IEEE specification with the working title: "Recommendation for using IEEE LOM Elements in Dublin Core Metadata"

- Members of both DC-Education and IEEE LTSC will participate.

- Interact with the DCMI through the DC Education working group.

- Interact with the LTSC through an IEEE LTSC working group.

- Membership in IEEE LTSC will *not* be mandatory, and the mailing list/web site will be open to anyone.

- Lead: Mikael Nilsson, Jon Mason

- The initial technical editors: Mikael Nilsson, Andy Powell, Pete Johnston

- The intention is to publish the recommendation as both an IEEE "Recommended Practice" and a DCMI "Recommendation".

  - Consensus within both IEEE LTSC community and the DCMI community

  - Both communities will be able to contribute to the production of a draft recommendation

  - Both communities will be able to participate in the commenting/balloting process

  - Comments from both communities will be shared between the communities

  - Comments from both communities will be considered and resolved by the taskforce.

  - The DCMI and the IEEE LTSC will each have the right to veto the final publication of the joint standard. Thus, if one of the organizations do not agree to the publication of the standards, the publication will be stopped in the other organization.

Roadmap

- Get approval from LTSC that we want to take this path to LOM/DC interoperability

- Kill 1484.12.4 (the LOM RDF binding)

- Start LTSC study group with the given Scope&Purpose as input.

- Setup necessary links on the LTSC site.

- Submit a PAR for a 1484.12.5 (?) IEEE Recommendation or similar

- Maybe more

Status

- Written first version of "Agreement"
  - Accepted by DCMI Advisory board at DC2005
- Wiki, Mailing list setup
- Needed now:
  - Acceptance from LTSC [SEC?]
  - New study group in LTSC [SEC?]
  - Kill 1484.12.4 [SEC?]
 - Add links to IEEE LTSC site [Me...]

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

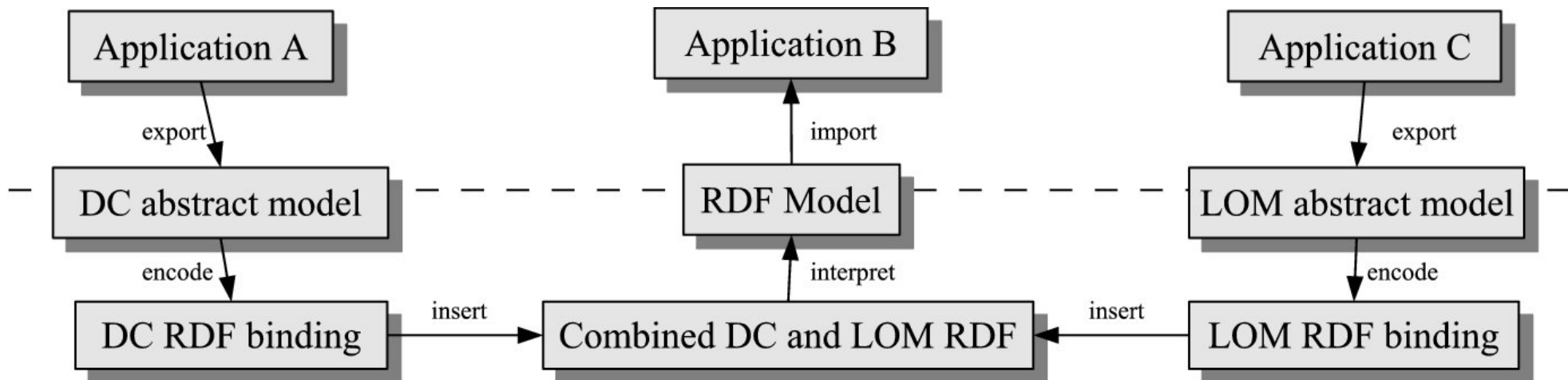- ...but the interpretation of these expressions differ

Interpreting metadata
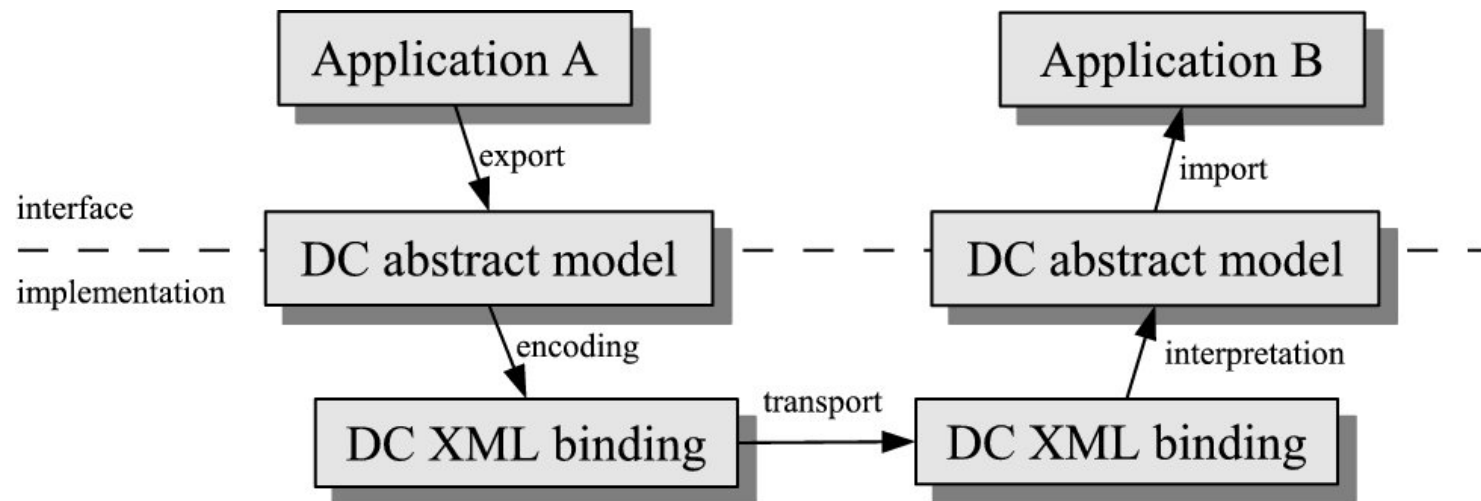
Combining XML fragments
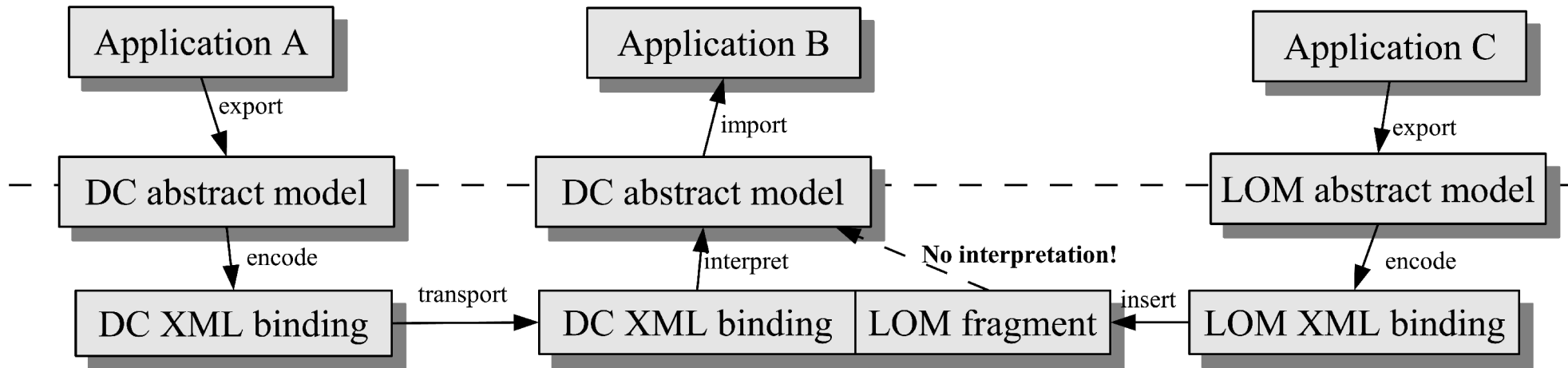
Combining RDF fragments

Interpreting XML and RDF metadata

Format	Extended with fragment from	Processable by LOM application	Processable by Dublin Core application
LOM XML	Dublin Core XML	Only LOM part	None
Dublin Core XML	LOM XML	None	Only Dublin Core part

Format	Processable by LOM application	Processable by Dublin Core application	Processable by RDF application
LOM+Dublin Core RDF	Only LOM part	Dublin Core part + most of LOM part	Dublin Core part + LOM part

Requirements

- 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.

An Interoperability Framework for Metadata Standards

LOM Data Model

Abstract Model

Schema model | Profile Model

Abstract Framework

conform to

expressed in

expressed in

Metadata formats

Metadata vocabularies

references

Application profiles

XML, RDF, XHTML, etc.

DC

Refinements

LOM

IMS

LOM AP

EdNA

Reuse

UK LOM Core

CID