CanCore

Canadian Core Learning Resource Metadata Application Profile

# Semantic Interoperability and Communities of Practice

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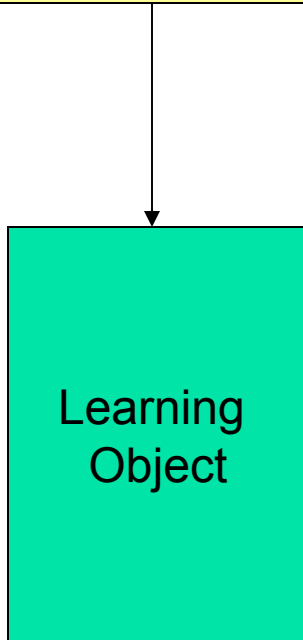norm.friesen@ualberta.ca
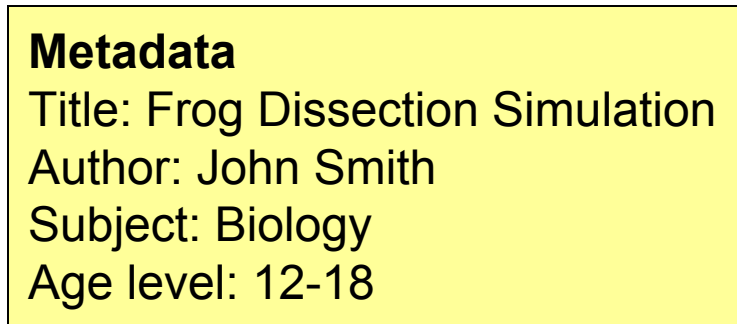
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Outline

- Metadata and resource discovery
- Metadata and meaning
- Learning Object Metadata and semantics
- CanCore's semantic guidelines
- Meanings and Communities of Practice
- DTD's, schemas, RDF, Ontologies as enabling different community relationships
- Where we go from here

Resource Discovery on the Web

John   12   dissection

science   biology   frog
18
Smith   simulation

?

Learning Resource
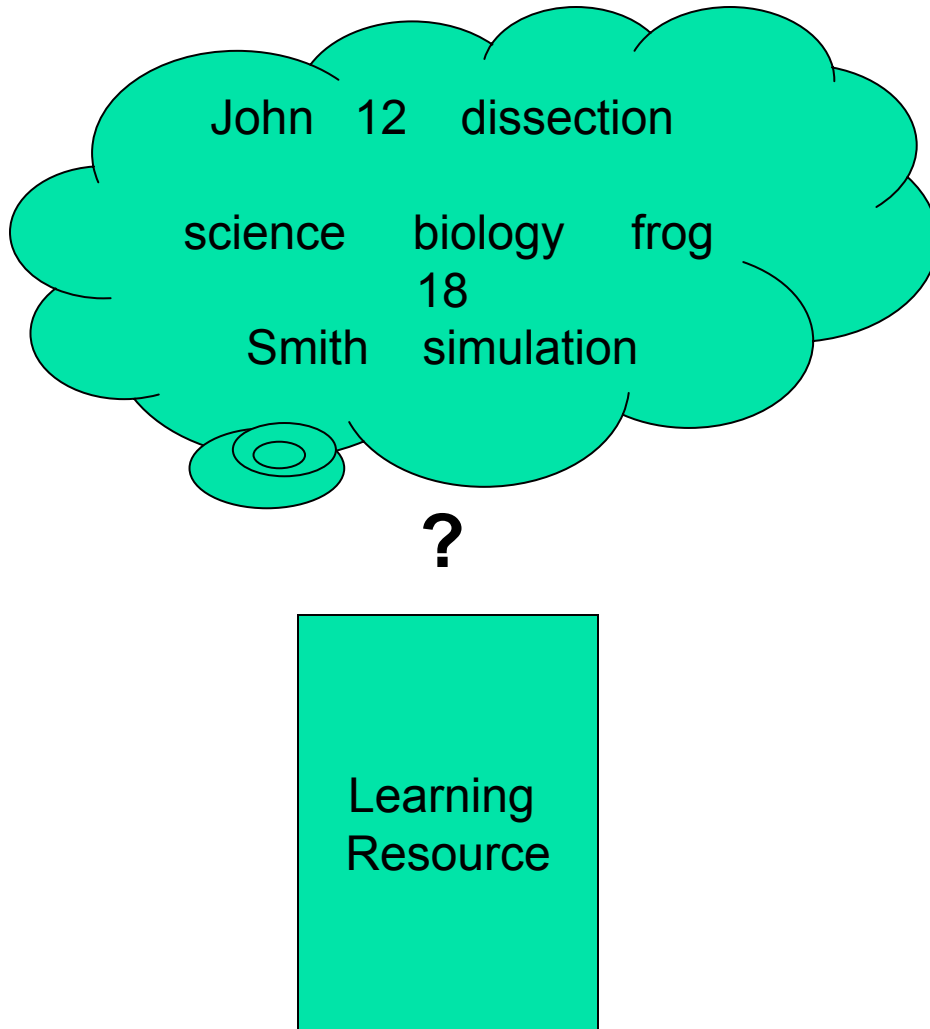
- Indexing and processing of formal tokens or character combination

- None is qualitatively different in significance from any other

Metadata: Data about Data

Metadata
Title: Frog Dissection Simulation
Author: John Smith
Subject: Biology
Age level: 12-18

Learning Object

- Terms are structured, and assigned significance
- Human intervention occurs either at the point of object or metadata creation
- Through structure and context, characters become words, and acquire meaning

Meta**data** is a contradiction in terms

Hierarchy of knowledge:

1. **Data:** information in numerical form that can be digitally transmitted or processed
2. **Information:** data that is endowed with relevance or purpose.
3. **Knowledge:** to be familiar or acquainted with, or to be aware of.

1's and 0's cannot be "about" anything. Only information and knowledge can.

How does learning object metadata deal with this?

"for 5 years now, people have side-stepped the issue of semantics." (Mike Pettit)

"The meaning associated with a vocabulary value is defined by the corresponding term in the Oxford English Dictionary, 2nd Ed., 1989, unless explicitly defined in the LOMv1.0 Base Schema."

e.g. *Author: b. (of all, of nature, of the universe, etc.) The Creator.*

1508 FISHER Wks. I. 198 Auctour and maker of all thynges.

Rationale: Examples

- IMS Element 5.4 Semantic Density: "subjective measure of the learning object's usefulness as compared to its size or duration"
  - omitted in CanCore
- IMS Element 1.2 Title "Learning Object's name."
  - Word order, subtitles, multilingual titles, series/episode titles
- IMS Classification Element Group "Description of a characteristic of the resource by entries in classifications."
  - CanCore seeking coordinated definition of classification uses, purposes, and vocabularies: e.g. for object granularity, accessibility

■ "Many vendors [have] expressed little or no interest in developing products that [are] required to support a set of meta-data with over 80 elements"

IMS LOM Best Practices and Implementation Guide, IMS, 2000

How can we do better?

- Define vocabulary and element meanings

- Refer to reliable, interoperable best practices in resource description

- Discuss ambiguities and the choices that can be made to resolve them: both semantic and technical

- Provide examples based on real descriptive metadata instances from a variety of contexts

CanCore Guidelines

- Refinement of LOM definition

- Best practice guidelines -often divided into sections

- vocabulary recommendations and definitions

- Multiple examples: simple text and XML encoded

- Technical implementation notes.

- If element not explicated, provides rationale for its omission

CanCore as an Application Profile

Complexity decreases

IMS Metadata
Information
Model: appx.
80 elements,
little interpre-
tation

**Implementation
CanCore - CAREO**

Specificity and
Interoperability increases

Degrees of Interoperability

- Data normalization: e.g. author/title word order and capitalization
- Vocabulary and element definition: e.g. Diagram, Figure, Graph, Index, Slide
- Syntactic/Semantic relationships
- Inter-indexer consistency
- Other concerns:
  - Relation: to what?
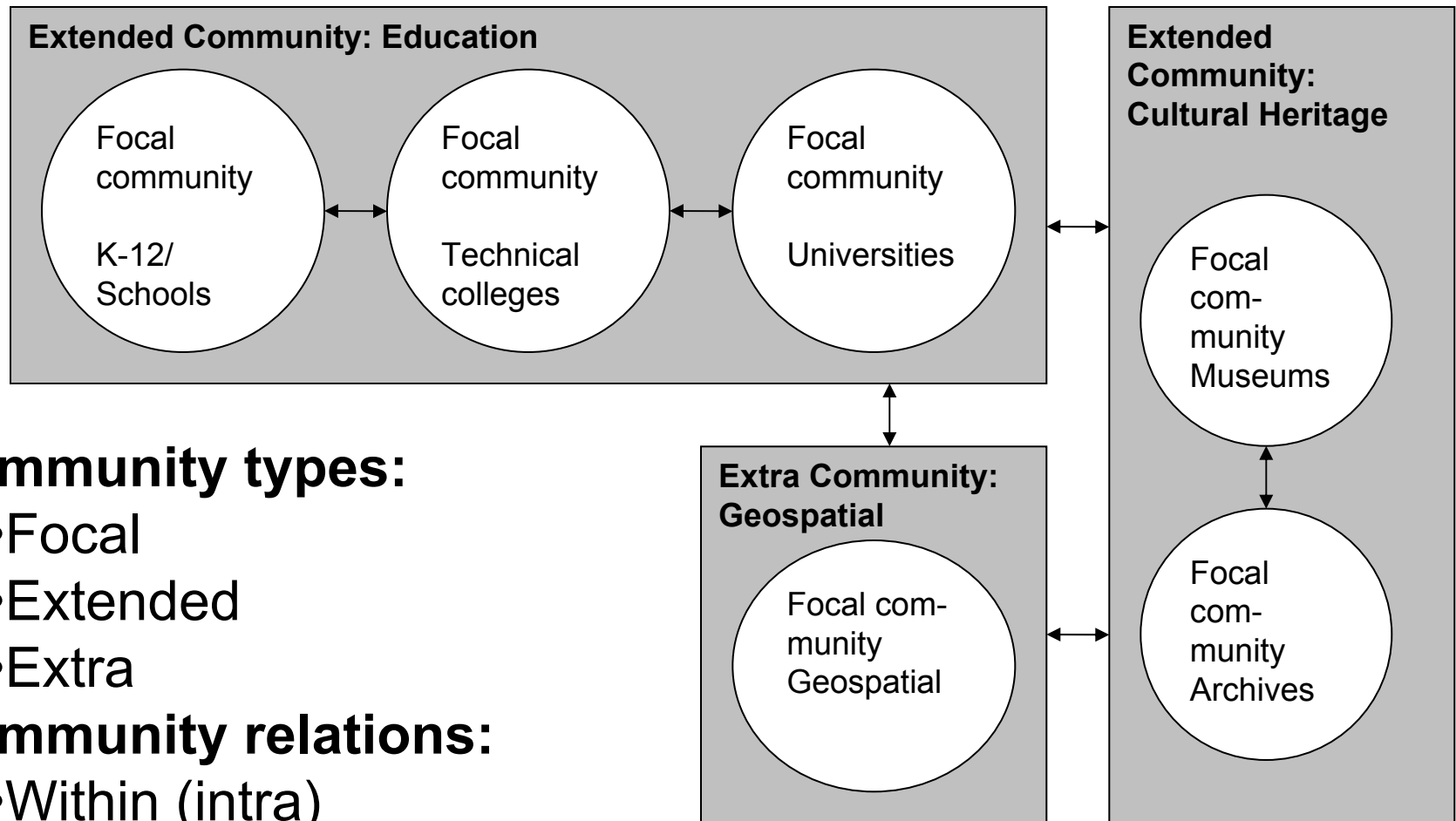 - Requirements; Type, Name, Min/Max versions

Meanings and Communities

- This focus on meaningfulness is… not primarily on the technicalities of "meaning." It is not on meaning as it sits locked up in dictionaries. It is not just on meaning as a relation between a sign and a reference…. *Practice is about meaning as an experience of everyday life.*

  Etienne Wenger (1999)

- Negotiation of meaning through practices and participation in a community.

Community types

Extended Community: Education

Focal community

K-12/ Schools

Focal community

Technical colleges

Focal community

Universities

Extended Community: Cultural Heritage

Focal com-munity Museums

Focal com-munity Archives

Extra Community: Geospatial

Focal com-munity Geospatial

- **Community types:**
    - Focal
    - Extended
    - Extra
- **Community relations:**
    - Within (intra)
    - Between (inter)

Relationship Enablers

- Intra-Community (within a focal community):
  - DTD
  - Schema

"the semantics of a DTD are implicit...the meaning of an element in a DTD is inferrd by a human...software tools cannot acquire these semantics independently."

(Heflin & Hendler)

Relationship Enablers, con't

- Inter-Community (between focal or extended/extra communities):
  - RDF: syntax
  - Ontologies: semantics
- First, need to make meanings explicit within communities, and provide clear definition that community members can agree upon.

Conclusion

- Efforts like CanCore just beginning to address intra-community meanings in elearning.

- Need to look to community practices and workflows, not formalization and abstraction to continue this work.

- There are ways of understanding and negotiating meaning between and within communities and practices (e.g. boundary objects, domain analysis)

Find out more about

CanCore at:

www.cancore.org