Ontologies and Controlled Vocabularies for Communities of Interest

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Ontologies and Controlled Vocabularies: Definition

	Controlled Vocabulary	Ontology
Definition	A controlled vocabulary (CV) is a set of terms in natural language that are vetted according to some criteria, such as their accepted usage in a community • CVs are structured by one or more ordering relations, such as "narrower-than," "broader-than," or "related-to" • Structure is machine processable • Semantics is implicit in natural language definitions: humans must interpret	An ontology clearly defines the meaning of a controlled vocabulary in the form of a conceptual model • Ontologies can be independent of any given controlled vocabulary • Structure can be machine processable and semantics can be machine interpretable • Semantics is explicit: machines can interpret

Example	Terms	Relation	
	entity	broader-than person broader-than organiz.	
	> person	narrower-than entity	
	>> eye color	related-to person	
	>> SSN	related-to person	
	>> employer	related-to person	
	> organization	narrower-than entity	
	>> EID	related-to organization	

Controlled Vocabularies and Ontologies

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- Controlled Vocabularies
    - Controlled vocabularies and other terminologies are necessary lexical resources and should be linked to ontologies
    - Controlled vocabularies and other terminologies are ways of referring to concepts and real world referents
- Ontologies
    - These concepts, real world referents, and their associated relations, properties, values, and rules are characterized by and represented as ontologies
    - A term in a terminology "means" a concept (or a complex collection of associated concepts); without linkage to a concept, a term has no meaning (we are talking about terminologies and ontologies here as engineering products)

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Communities of Interest Vocabularies and Ontologies

- Communities of Interest (COI) are human communities that typically transcend institutional boundaries, and form based upon mutual interests
  - Communities of Interest (COI) self-organize to share information
  - Two or more communities that wish to share information form an intersecting COI
- The COI tries to determine a common vocabulary AND a common set of meanings for that vocabulary and the information referred to
  - An ontology characterizes and represents the meaning of that COI vocabulary
  - An ontology tries to capture and describe the real world entities and relationships of the information the vocabulary refers to
- Both controlled vocabularies & ontologies are necessary

Ontologies and Controlled Vocabularies: IAOA

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- IAOA can assist communities and institutions by
  - Providing best practices and lessons learned from many vocabulary and ontology efforts
  - Encouraging the linking of terminologies to formal representations of what they mean and refer to in the world, I.e., ontologies
  - Formal and informal educational outreach about semantics (ways of referring) and ontologies (what is referred to) and COIs, which need both
  - Supporting the development of better engineered human interfaces to applications and services of ontologies