

Use of Ontologies in Standards

Ed Barkmeyer

Manufacturing Engineering Laboratory

NIST

Bullets

- Kinds of Information Technology Standards
- The OMG Model-Driven Architecture
- The role of Ontologies
- Languages for concept capture

Kinds of IT standards

- Exchange standards
 - define a document form for conveying info
 - languages define data elements and structures
- Interface standards
 - define an interaction for providing a service
 - simple interactions defined by messages or invocations (request/response messages)
 - complex interactions defined by choreography of message exchanges

OMG Model-Driven Architecture

- Original concept:
define conceptual interface models
 - independent of implementation technology (Java, CORBA, webservices)
 - use UML interfaces and activities
- Requires shared information model:
 - description of the problem/solution space
 - defines the concepts and relationships used in the interface specification
 - use UML classes and associations
- Many info models become exchange stds

Role of Ontologies

- Information model = ontology
 - definition of concepts used in specification
 - classes, properties, information units, constraints
- Application of concept model
 - exchange standards
concepts for document elements
 - interface standards
concepts for message elements
 - standards of practice in general
concepts for domain and practice elements
- Extension to specify behaviors

Knowledge Capture

- Concept capture languages
 - Natural language: no structured syntax, no formal interpretation
 - UML: all classes and properties are primitive semi-formal interpretation
 - OWL: most properties are primitive, many classes can be defined formal interpretation
 - FOL: classes/properties defined by axioms formal interpretation
- Concept legibility: NL and UML are readable