

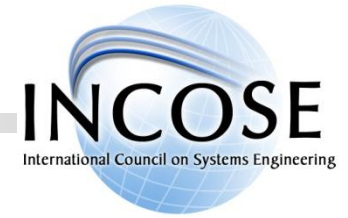


Ontology from an MBSE perspective

Brief-out from breakout session
Monday, January 31st, 2011



Ontology from an MBSE perspective



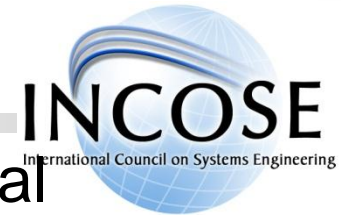
1. What is an ontology?
2. Why apply ontologies to MBSE?
3. What are some approaches?
4. What are the critical issues?
5. Roadmap?



Why apply ontologies to MBSE?

- Formalized definition of a domain
- Enables semantic interoperability
 - Within domains
 - Across domains
- Tool/platform independence
- Long term stable definition
- Enables types of analysis: inferencing / reasoning
- Enables re-use across projects and enterprises
- Allows to reap benefit from semantic (web) technology
- Supports effective tool production (MDA-like)
- Knowledge management / sharing
- Helps / forces you to think more clearly about design problem

What are some approaches?



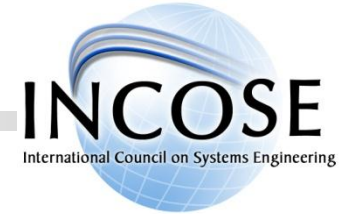
- NASA/JPL develops QVT based bi-directional transformations between SysML/UML and OWL as well ontologies for space system development
 - Ontologies are largely generic
 - Working to release ontologies
- ECSS develops conceptual data models in UML2
 - Derived concepts from SysML, AP233, ESA projects
 - Tool-independent definitions
 - Eclipse based tool implementation for validation
 - Evolved into complete tool development framework
 - About to be published on www.ecss.nl
- Henson Graves: Retrofit SysML with formal semantics
- Fact Based Modeling (FBM)
 - Consolidate ORM (Object Role Modeling)

ECSS = European Cooperation for Space Standardization





What are the critical issues?



- To make the case for ontologies
 - Up front investment / Convince management
 - Note:
- Semantic foundations of UML/SysML are incomplete and complex
 - Hundreds of issues found in UML 2.4 revision
- Scope of SysML is very large
- What methodology to use to develop ontologies?
- What is the technology to capture ontologies in?
 - Model management issues
 - Ontology development tools not yet at industrial robust level





Roadmap?

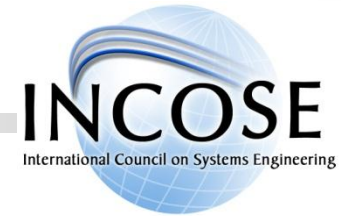


- Refine this material
- Team charter
- Write up on 4 approaches
 - Address the benefits / shortcomings of each
- Post the above to OMG Wiki
- Identify next steps
 - Consider papers for IS12 in Rome





Participants



- Henson Graves (Lead)
- Armin Mueller
- Harald Eisenmann
- Ray Jorgensen
- Roger Burkhart
- Sandy Friedenthal
- Steve Jenkins
- Steve Vanhorn
- Hans Peter de Koning (reporter)

