CLOUD SERVICES & ENGINEERING APPLICATIONS

Synthesis I

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TRACK CHAMPIONS
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Mission & Goal

• Explore the techniques that people are using to achieve semantic integration and interoperability in the areas of Cloud Services and Engineering / Manufacturing

• Identify the role that ontologies play in these areas
Progress

• 3 March 2016 – Cloud Services & Semantic Integration
  – Peio Popov (Ontotext) -- *On Demand RDF Databases in the Cloud*
  – David Price (Top Quadrant) -- *Some Thoughts from TopQuadrant: Cloud and SI*
  – Mark Underwood (Krypton Brothers) -- *Cloud Service Design Patterns*

• 17 March 2016 – Semantic Integration in Engineering
  – Robert Young (Loughborough University) *Semantic Interoperability -- Towards a Standard Manufacturing Reference Ontology*
  – Kevin J Lynch (Raytheon) -- *Domain Ontology Compliant Semi-automated Conceptual Product Design*
  – Michael Gruninger (University of Toronto) -- *The Ontological Imperative in Manufacturing*
3 March – Key Points

• Increasing commercial support for CoI-friendly RDF infrastructure and semantic capabilities (TopQuadrant, Ontotext, Neo4j) with high profile clients (S4: BBC, Wiley, AstraZeneca, Getty, TopQuadrant: oil + gas)
• But: Many offerings remain within internal silos (SAP, SAS, Oracle Spatial + Graph, Microsoft RDFSharp, Neo4J)
• Fine-grained policy management needed to expand semantic cloud apps (D Price)
• Elastic semantic capability infrastructure and services, e.g., pay-per-use, pay-per-hr, DevOps-friendly deployment (e.g., S4 on AWS, Docker to deploy TopBraid on AWS)
• “Cloud as silo-breaker,” but customers “not rushing” to cloud (D Price)
• Semantic integration via an overlay architecture (i.e., original data remains in situ)
3 March – Key Points

• Trends to watch: microservices, API catalogs, middleware + orchestration, iServe, expanding use cases for REST, stds for IoT (See Summit 2015), cloud machine learning tooling (e.g., Google Cloud Machine Learning, Cortana Intelligence + Machine Learning, IBM Cognitive Cloud)

• Software dev lifecycle issues: Ontologies seldom delivered standalone (D Price)

• Growing commercial recognition of ontology and support for RDF infrastructure and NLP tools

• Use of cloud capabilities to provide semantic capability infrastructure and services

• Access to semantic capabilities becoming easier

• A little bit of ontology can solve simple interoperability problems
17 March – Key Points

- Manufacturing is complex; Domain ontologies too specific and foundation ontologies too generic – manufacturing reference ontologies needed to bridge the gap
- OWL not sufficient, Common Logic needed
- Use of closed world assumption is valid in many manufacturing domains
- Manufacturing systems need to respond to changes more quickly
- Knowledge of production needs to be linked to design
- Ontologies can be used in the design phase to semi-automate analysis of alternatives reducing risks and cost; Then repurposed to the product space domain
- Semantics embedded in many software applications and tools used in engineering and manufacturing
- Over reliance on (and expectations of) standard terminologies