Ontolog Forum Scheduled Discussion
http://ontolog.cim3.net/cgi-bin/wiki.pl?ConferenceCall_2005_10_20

Semantic Web Service Ontology Standards

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Web Services: Practical yet?

Standards have been evolving quickly & maturing impressively...


Tim Berners-Lee’s “semantic web stack” (2003 version)

- Which stack?
- How sturdy?
- Will it last long enough to get ROI?

...but the cleaned up version Isn’t a standard (yet)

...success increases demand for more features... (2005 version)

...standards allow Computer Scientists to scrutinize for bugs...

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Are Semantic Web Services & Pragmatism Compatible In The Same Context?

- "The Practical Programmer" (Hunt, Thomas)
- Bend or Break (ch. 5)
  - Accommodating "change" requires two things:
    - flexibility (e.g. for reusability and robustness to changes)
    - reversibility (e.g. for adaptability w.r.t. changing past decisions)
  - Pragmatic recommendation: decoupling!
    - Data model (~ ontology for describing a "web service")
    - Views on that model (e.g., matching, advertising, negotiating..)
- Are Semantic Web Services pragmatically sensible?
  - Efficiency Concerns - volatility of standards & rework
  - Risk Concerns - bleeding-edge technology & critical factors
Impressive Achievements & Progress are Increasingly Hard to Ignore

- Application success stories & poster childs
  - Early adopters: Bioinformatics & Medecine

- For the pragmatists among us who can’t go to Ireland…

  Step1: Ok, let’s play semantic web services…
  - Which stack do I use?

  Step2: Ok, I got the stack…
  - What infrastructure can this stack run on?

  Step3: Ok, I got the stack & the infrastructure…
  - What tools do I use?
  - What problems can I tackle with all of this?

  Today’s discussion will be an overview of 4 approaches:
  OWL-S, WSMO, WSDL-S, SWSF

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Connection with JPL, NASA & the broader Space Community

- Space missions have complex **Architectures**
  - Complexity due to distribution across space, time, organizations, objectives...

- Without the "**web**", this looks like a "**semantic service**" architecture...
  - Is a "semantic web service" description a view on the architecture of that system?
From the IEEE-1471-2000 conceptual framework...

IEEE-1471-2000 provides recommendations only...

RM-ODP formalizes these concepts...
http://www.lcc.uma.es/~av/RM-ODP/

These concepts are useful to describe what a space mission is...

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Space Data System
Several Architectural Viewpoints

Viewpoints from the "Reference Architecture For Space-Data Systems" (a CCSDS draft standard)

Enterprise

Business Concerns
Organizational perspective

Connectivity

Physical Concerns
Node & Link perspective

Functional

Computational Concerns
Functional composition

Informations

Data Concerns
Relationships and transformations

Communications

Protocol Concerns
Communications stack perspective

Derived from: RM-ODP, ISO 10746
Compliant with IEEE 1471
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RM-ODP viewpoints = A mechanism for dealing with the complexity of distributed systems
ODP & Semantic Web Services = A sensible combination

An ODP system specification

- business context
- business processes

- information
- changes to information
- constraints

- object configuration
- interactions between objects at interfaces

- mechanisms and services to provide the required distribution transparencies and QoS constraints.

- hardware and software components implementing the system

http://www.lcc.uma.es/~av/RM-ODP/Presentations/ISOIEC19793UML4ODPspecv08.pdf
Architecture, Web Services & Semantics
What makes this a potent mix of ideas?

- Barry Smith (October 13, 2005)
  How to Do Things with Paper: The Ontology of Documents and the Technologies of Identification
  - A summary of missing things from existing document ontologies...
    - The significance of documents in society & institutions (deontic powers)
    - The social interactions in which documents play an essential role
    - Document as (1) stand-alone entity vs. (2) something with proxy & remote attachments
    - ...(many more)

- Relationship to practical issues of ontology development
  - OntoClean’s meta-properties = Identity, Unity, Rigidity, ....

- Relationship to web services (a context of social interactions)
  - Document roles as process inputs & outputs vs. messages (e.g., FLOWS )

- Relationship to open-distributed processing (a larger social interaction milieu)
  - Service description as a document (is it allegorical? autographical?)

Distinguish scientific interest ... (e.g., philosophy, theoretical computer science, mathematics)
From engineering pragmatism... (e.g, the wisdom required to make informed technology choices)
⇒This is a discussion about the latter ⇐
Today's discussion

• Standards are evolving rapidly
  – OWL-S 1.1 => 1.2
  – WSDL-1.0 => 2.0
  – ...

• Semantic Web Services & Pragmatism
  – Practical approaches (e.g., tool-support)
    OWL-S (incl. CMU’s), WSMO, WSDL-S
  – Examples of salient differences & key concepts important to understand
    (Plain) Web Services = WSDL or ???
    (Process semantics) = OWL-S or WSDL-S or FLOWS (from SWSF) or ???
    (Practical reasoning) = with semantics (e.g ROWS from SWSF) or without ?

• Today's discussion focuses on a (limited) selection
  – What are the 4 most important topics to be aware of, how do they relate?
A Distinguished Panel of Experts

OWL-S by David Martin
Senior Computer Scientist at SRI International

WSMO by John Domingue
Deputy Director of the Knowledge Media Institute

WSDL-S by Amith Sheth
Professor of Computer Science, U. of Georgia

SWSF by Michael Gruninger
Research Scientist, U. of Toronto

• Each topic will be discussed in a 20 minute period
  – A presentation by the lead panelist (~ 10 minutes)
  – Questions, answers & discussion (~ 10 minutes)

• A cross-topic discussions, questions/answers at the end