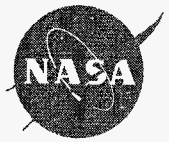

Ontolog Forum Scheduled Discussion

http://ontolog.cim3.net/cgi-bin/wiki.pl?ConferenceCall_2005_10_20

Semantic Web Service Ontology Standards

October 20, 2005

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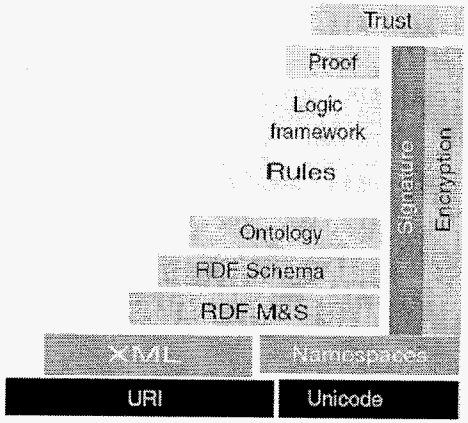
This work was performed for the Jet Propulsion Laboratory, California Institute of Technology, sponsored by the National Aeronautics and Space Administration.

JPL

Web Services: Practical yet?

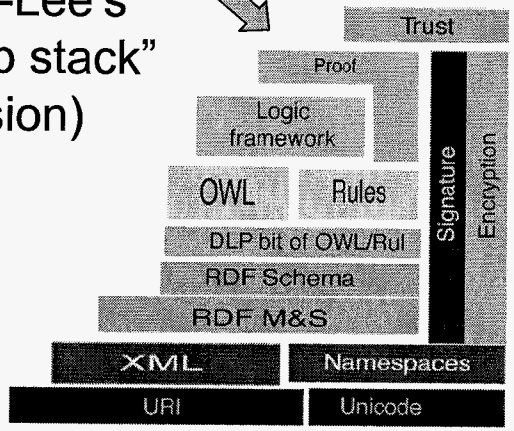
Standards have been evolving quickly & maturing impressively…

http://www.cs.man.ac.uk/~horrocks/Publications/download/2005/HPPH05.pdf

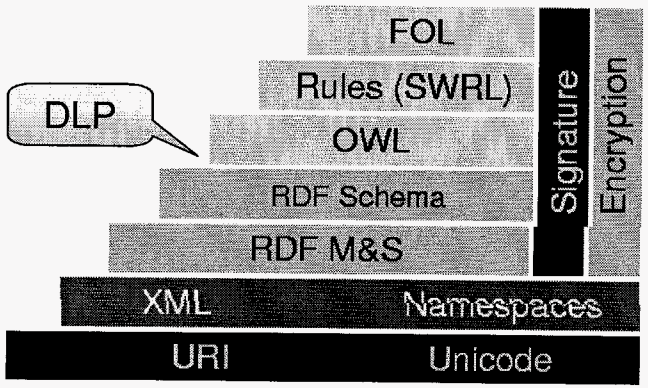


Tim Berners-Lee's "semantic web stack" (2003 version)

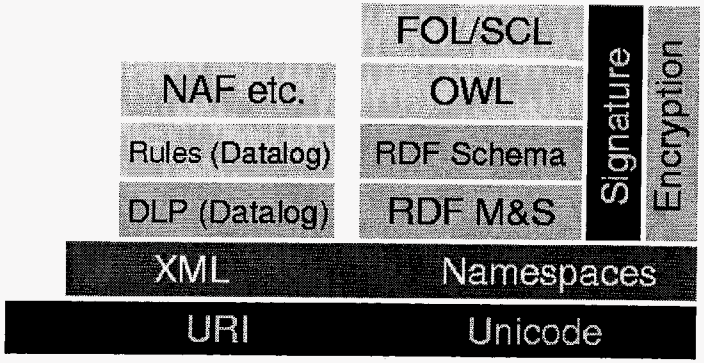
- Which stack?
- How sturdy?
- Will it last long enough to get ROI?



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



…but the cleaned up version Isn't a standard (yet)



…standards allow Computer Scientists to scrutinize for bugs…

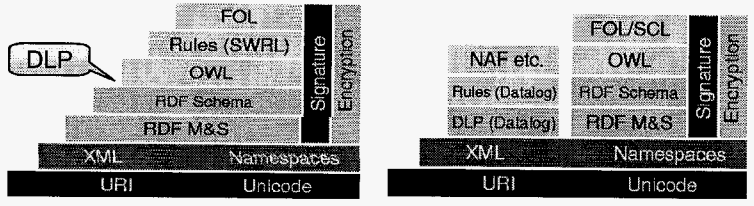
Are Semantic Web Services & Pragmatism Compatible In The Same Context ?

- "The Practical Programmer" (Hunt, Thomas)
- Bend or Break (ch. 5)
  - Accomodating "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
  - More next month: http://iswc2005.semanticweb.org
- 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?

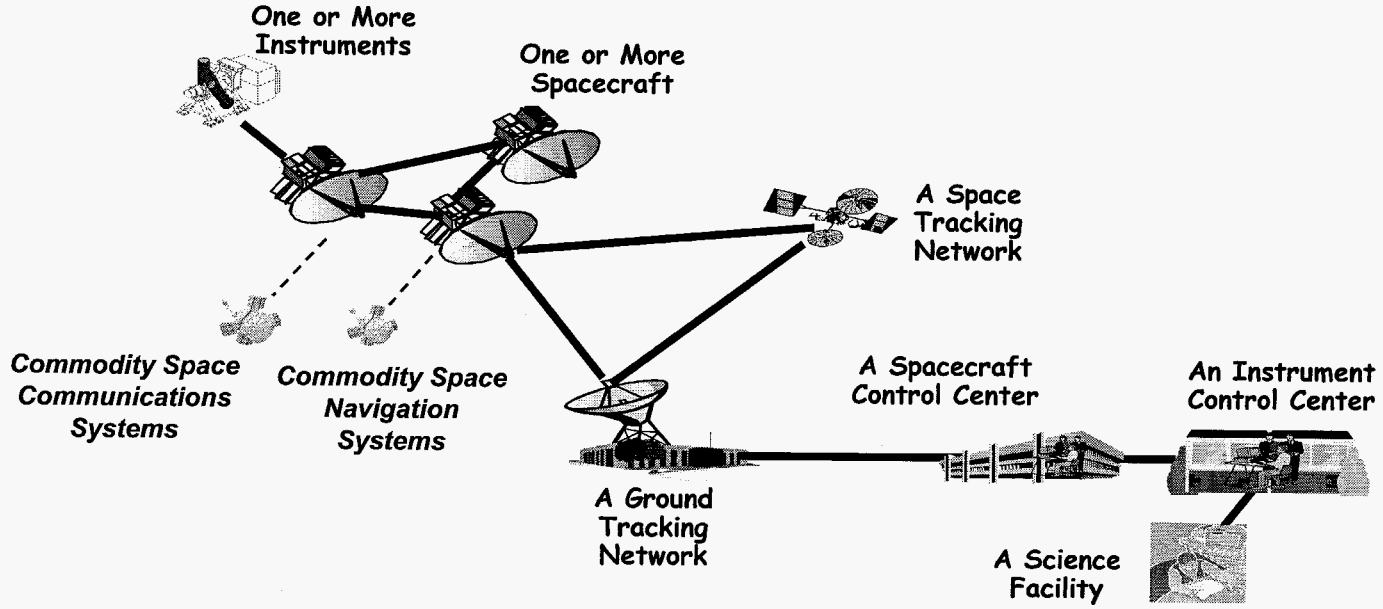
http://www.globalgridforum.org/
http://taverna.sourceforge.net
http://www.servicemix.org
http://www.alphaworks.ibm.com/grid
http://www.alphaworks.ibm.com/tech/ettkws
(examples for informative purposes only)

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

Connection with JPL, NASA & the broader Space Community

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

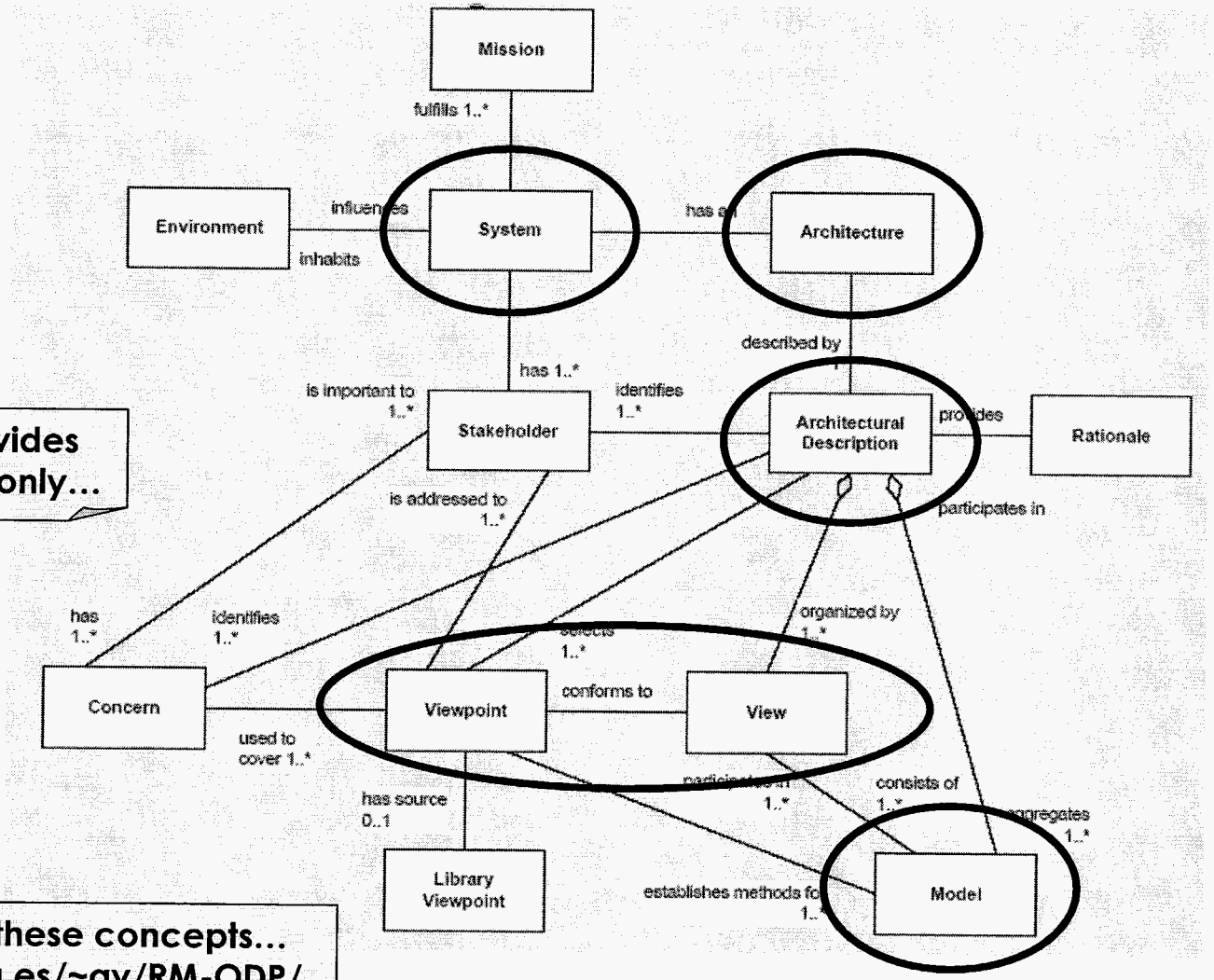


- Without the ***"web"***, this looks like a ***"semantic service"*** architecture…
  - Is a "semantic web service" description a view on the architecture of that system?

From: RASDS, CCSDS 311x0-M-1

Oct 20, 2005

From the IEEE-1471-2000 conceptual framework…



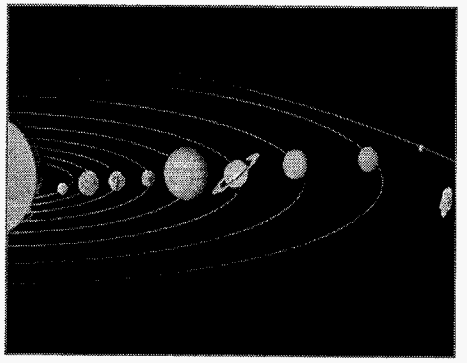
IEEE-1471-2000 provides recommendations only…

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

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

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

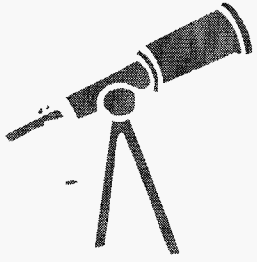
Physical Concerns
Node & Link perspective

Functional

Computational Concerns
Functional composition

Information

Data Concerns
Relationships and transformations



Communications

Protocol Concerns
Communications stack perspective

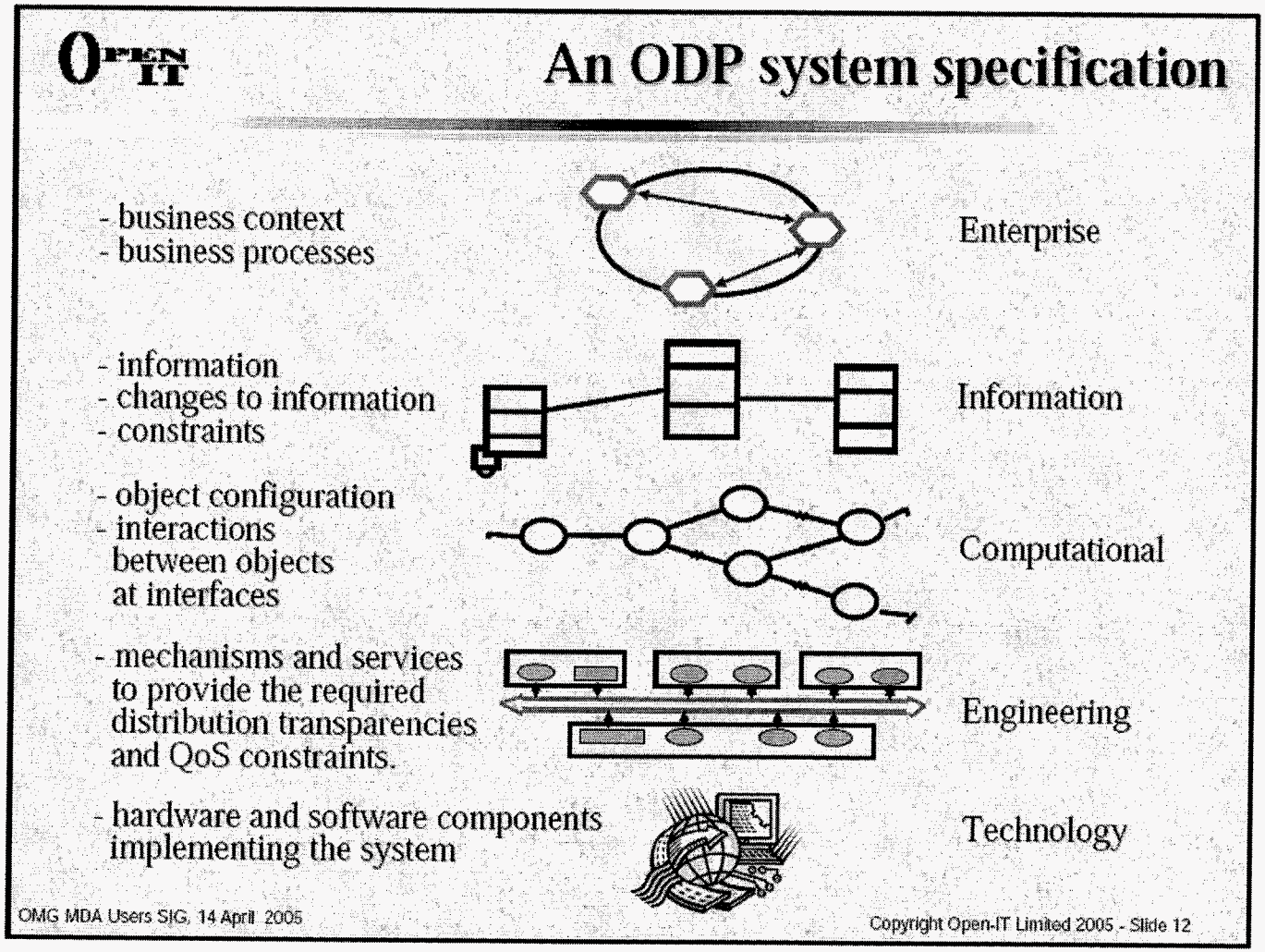
Derived from: RM-ODP, ISO 10746

Compliant with IEEE 1471

Oct 20, 2005

RM-ODP viewpoints = A mechanism for dealing with the complexity of distributed systems

ODP & Semantic Web Services = A sensible combination



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

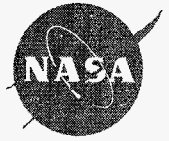
  http://ontolog.cim3.net/cgi-bin/wiki.pl?ConferenceCall_2005_10_13

  - 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