

# Convergence of Semantic Naming and Identification Technologies? The Key Questions

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A Joint Open Group, Federal Semantic Interoperability  
Community of Practice (SICoP), and Federal Metadata  
Management Consortium Conference

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Hilton Crystal City, Arlington, Virginia

# Outline

- 1. DRM – SICoP History
- 2. A Convergence Scenario
- 3. Key Questions

# 1. DRM – SICoP History

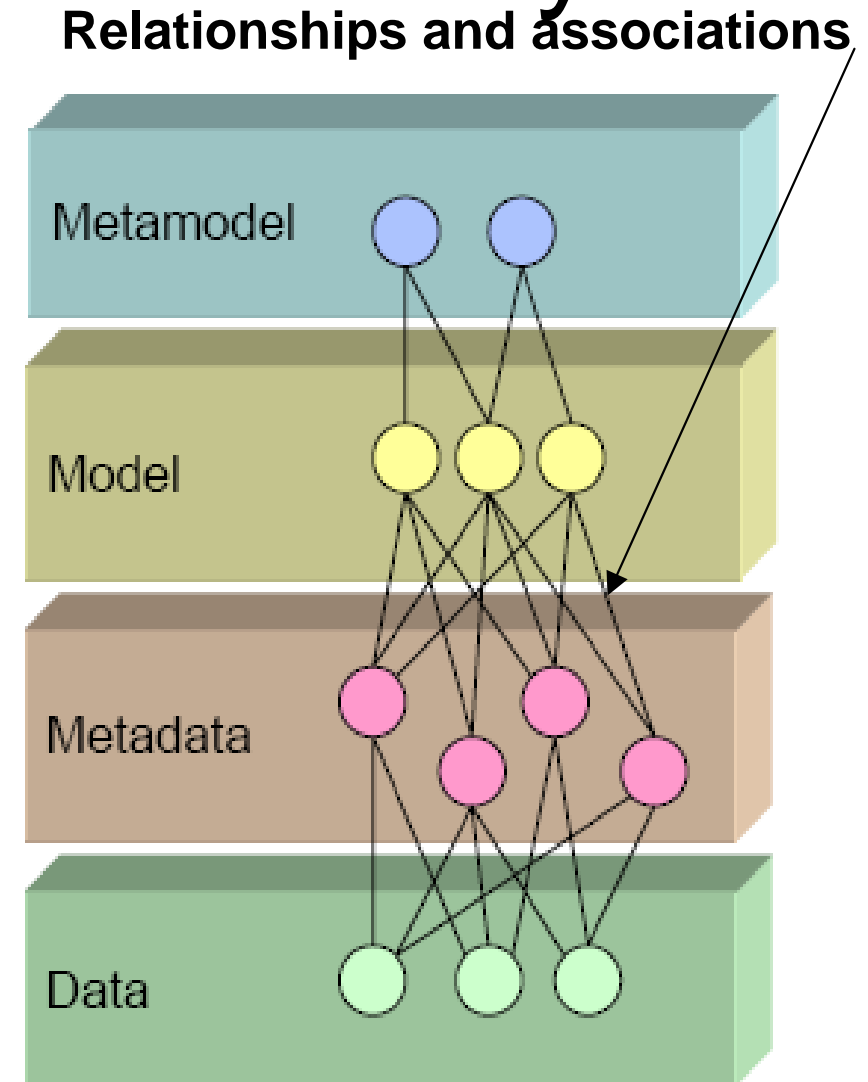
- December 2004, DRM 1.0 – Just structured data (Description) and exchange package (Sharing).
- February 2005, SICoP White Paper 1 (“Data Architecture of the Future”) – All three types of data (Description) and ontologies (Context).
- October 2005, SICoP DRM 2.0 Implementation Guide – Metamodel (Tolk) and Semantic Metadata (Davis and Obrst) (see slides 5-6).
- December 2005, DRM 2.0 – Description (3), Context (2), and Sharing (2) (see slide 7).

# 1. DRM – SICoP History

- April 2006, Knowledge Reference Model (KRM) = DRM 2.0 + Semantic Metadata implemented in Semantic Wikis for Trusted Reference Knowledge (TRK) (see slide 8).
- April 2006, Convergence of Semantic Naming and Identification Technologies for TRK:
  - Open Collaboration: Networking Health Information Technology, Collaborative Expedition Workshop #50, Tuesday, April 18, 2006 at NSF (see Section 2).
  - This Conference (see Section 3).

# 1. DRM – SICoP History

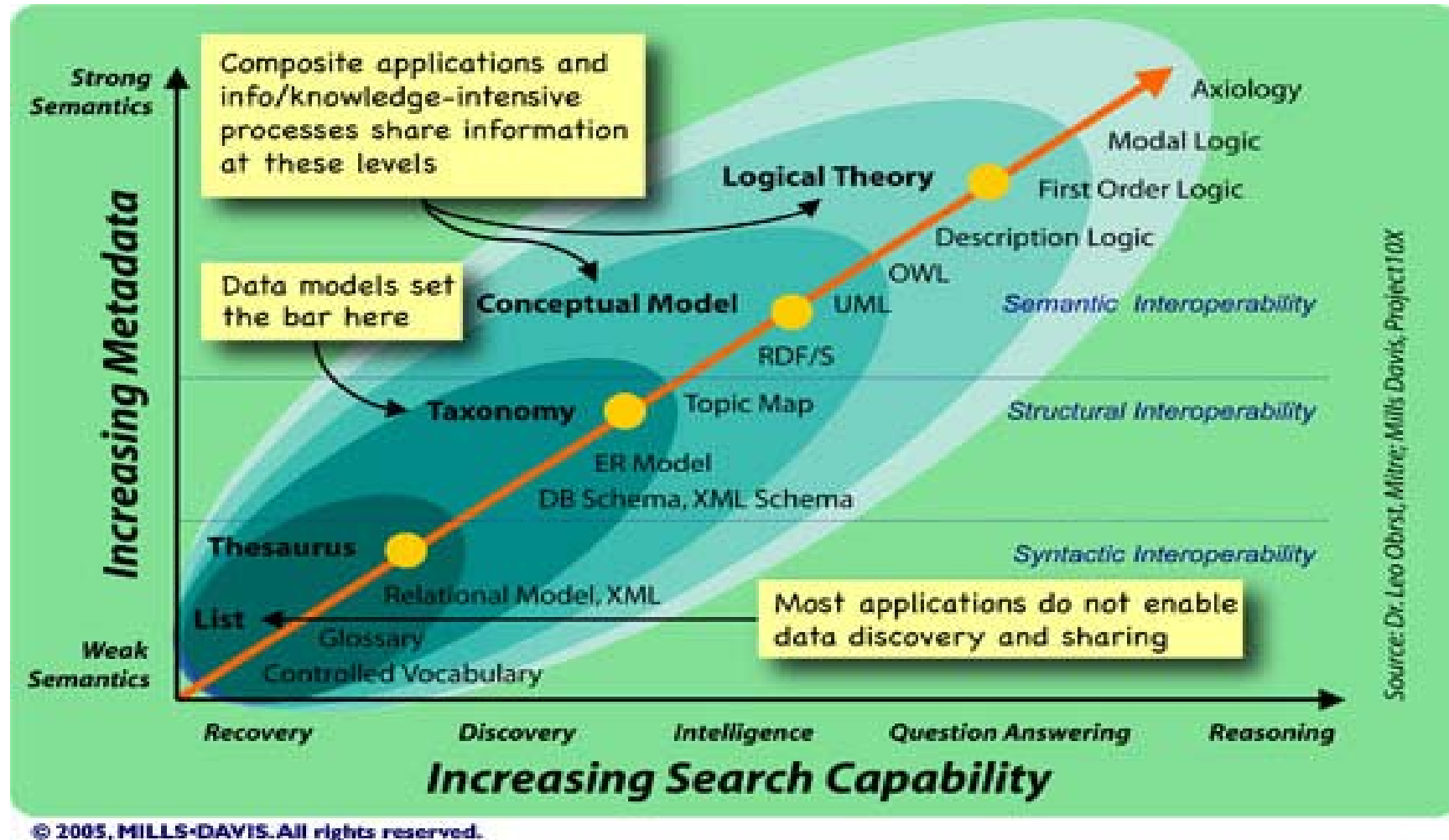
- Metamodel: Precise definitions of constructs and rules needed for abstraction, generalization, and semantic models.
- Model: Relationships between the data and its metadata.
- Metadata: Data about the data.
- Data: Facts or figures from which conclusions can be inferred.



Source: Professor Andreas Tolk, August 16, 2005

Source: DRM 2.0 Implementation Guide, page 6, October 17, 2005, 19 pp.  
See slide 9-10 for explanation.

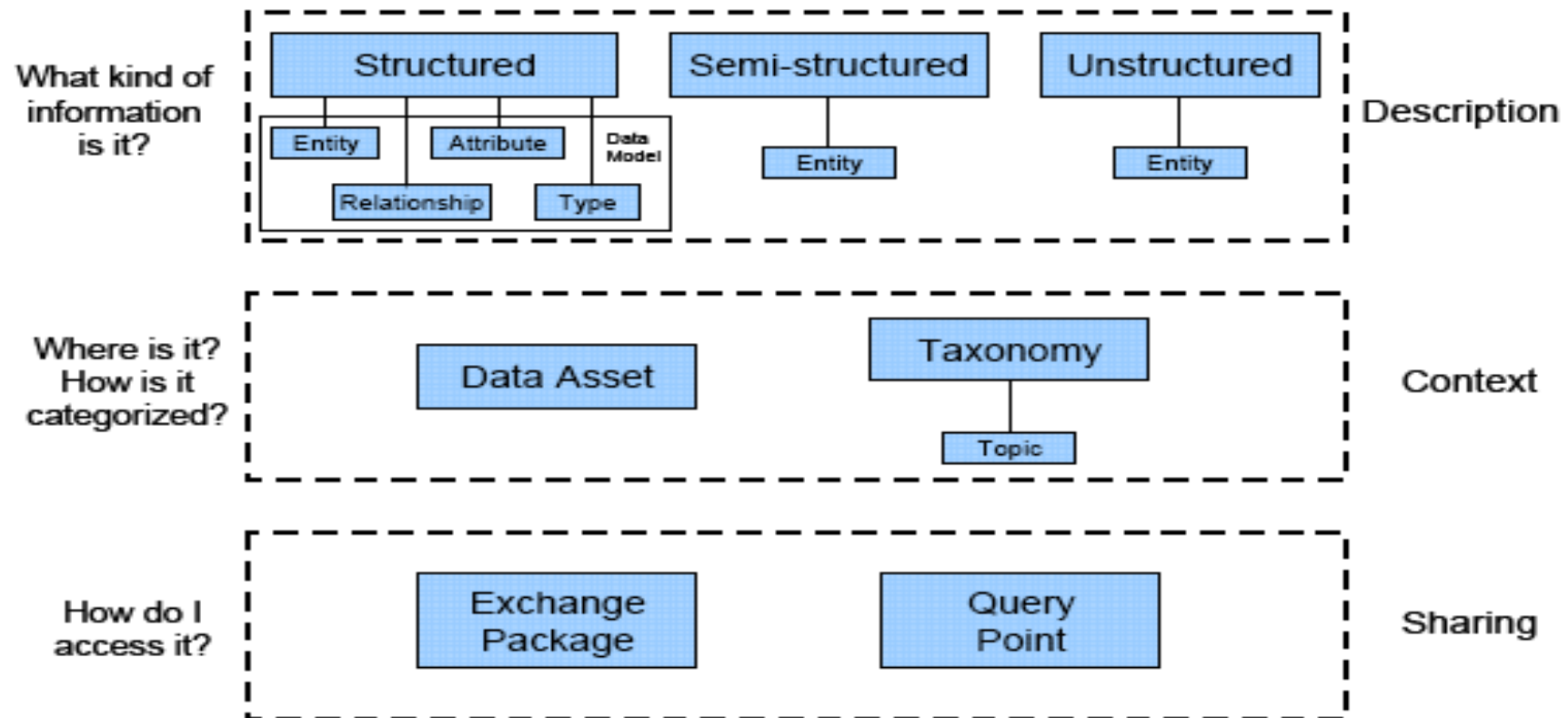
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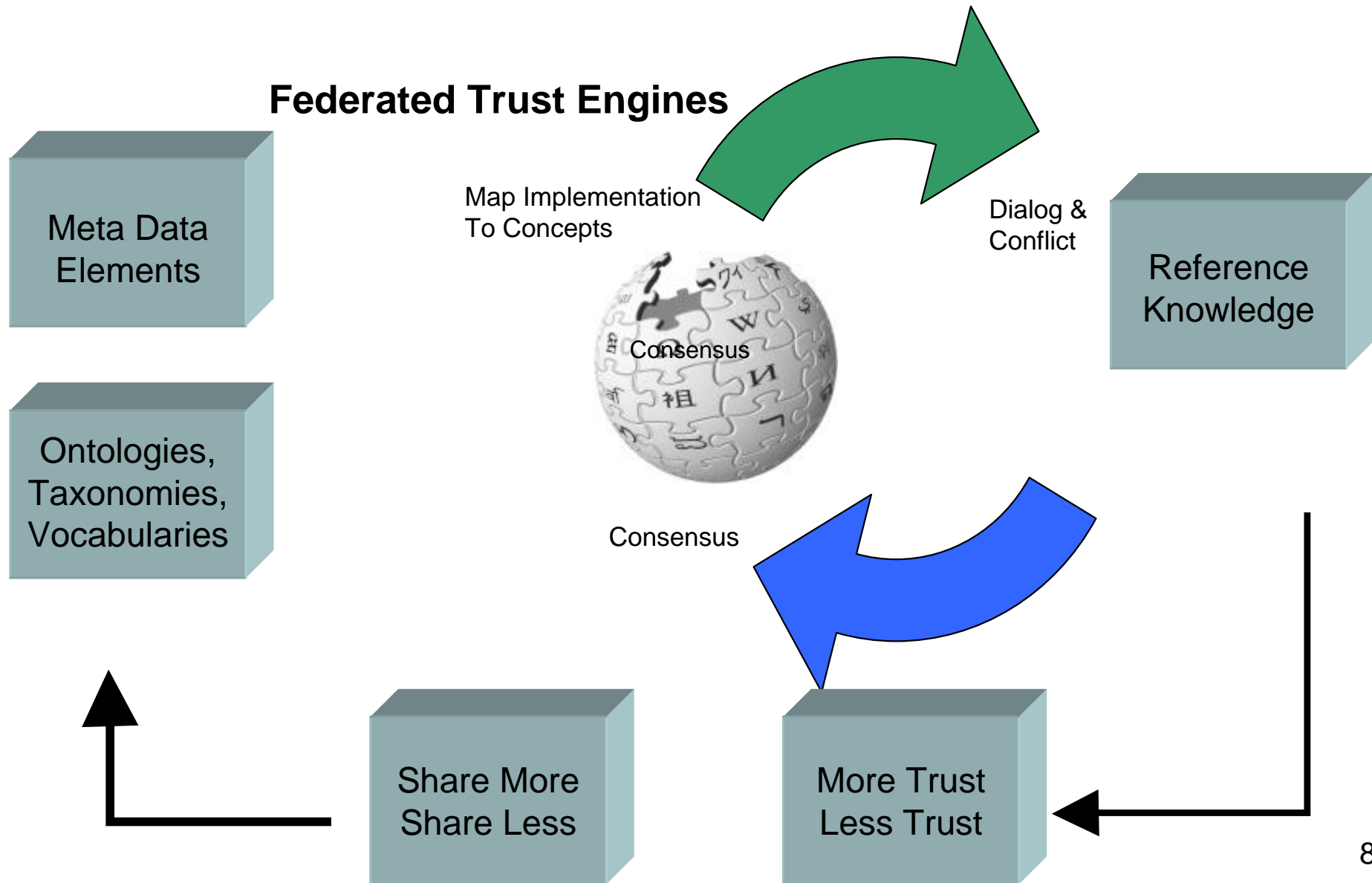
# 1. DRM – SICoP History

## The FEA Data Reference Model (DRM) 2.0



Source: Expanding E-Government, Improved Service Delivery for the American People Using Information Technology, December 2005, pages 2-3. [http://www.whitehouse.gov/omb/budintegration/expanding\\_egov\\_2005.pdf](http://www.whitehouse.gov/omb/budintegration/expanding_egov_2005.pdf)

# 1. DRM – SICoP History





# 1. DRM – SICoP History

- Slide 5: The purpose of this schematic is to show that we need to describe information model relationships and associations in a way that can be accessed and searched.
- Slide 6: The point of this graph is that Increasing Metadata (from glossaries to ontologies) is highly correlated with Increasing Search Capability (from discovery to reasoning).
- Slide 8: Semantic Wiki: Giving Communities of Practice Tooling to Implement the Data Reference Model (DRM) and Build Trusted Reference Knowledge, Conor Shankey, February 10, 2006.
  - See <http://colab.cim3.net/file/work/SICoP/2006-02-09/Presentations/CShankey02102006.ppt>

# 1. DRM – SICoP History

- So DRM 2.0 + Semantic Metadata = Knowledge Reference Model (KRM).
- DRM 2.0 Implementation Evolves to the SICoP Semantic Wikis and Information Management (SWIM) WG:
  - Antoinette Arsic, MITRE, and Mills Davis, Project10X, Co-Leads:
    - See <http://colab.cim3.net/cgi-bin/wiki.pl?SICoP/SemanticWikisandInformationManagementWG>
- Semantic Wikis and Semantic Research, Mills Davis, Project 10X, Co-Lead:
  - Stage 1: Internet Wiki
  - Stage 2: Semantic Web-based Wikis (15-20 projects circa 2006)
    - See <http://colab.cim3.net/file/work/SICoP/SWIM/SemanticWikiReview.ppt>
  - Stage 3: Knowledge Worker Automation
  - Stage 4: Knowledge Computing

## 2. A Convergence Scenario

- Open Collaboration: Networking Health Information Technology, Collaborative Expedition Workshop #50, Tuesday, April 18, 2006 at NSF:
  - Standardized vocabulary (e.g. CHI) – medical terminology
  - ISO/IEC 11179/UDEF – medical data
  - RFID – medicine in containers
  - RDF – medical instructions
  - RDF – medical images
  - IPV6 – medical devices
  - PURLs, etc. – medical literature
- An Electronic Health Record (EHR) that is not just electronic, but machine processable to reduce errors and costs (express and store in RDF, organize and reason over in OWL, etc.) that supports the FHA Data Architecture Work Group – a Semantic Technology EHR!

# 3. Key Questions

- Can we express ISO/IEC 11179 metadata in RDF/OWL?
  - Yes (E.g., Xmdr.org and VisualKnowledge).
- Can we express RFID in RDF?
  - Has anyone done this?
- Can we use IPV6 addresses for RDF URIs?
  - The URI versus the Upper Ontology (word) approach.
- Can we assign unique identifiers in Semantic Wikis so they function as meta-meta registries/repositories?
  - E.g., Purple Numbers, etc.
- Can we make associations between RFID, ISO/IEC 11179, UDEF, PURLs, etc. using RDF and query and reason over that database in a pilot project?
  - Essentially a meta-metadata registry/repository.
  - Reasoning over uncertainty with Ken Baclawski's Bayesian Web.