

Ontologies & Applications

Ontology Summit 2011

Track 1:

Ontology Application Framework

Session 1, Feb. 3, 2011

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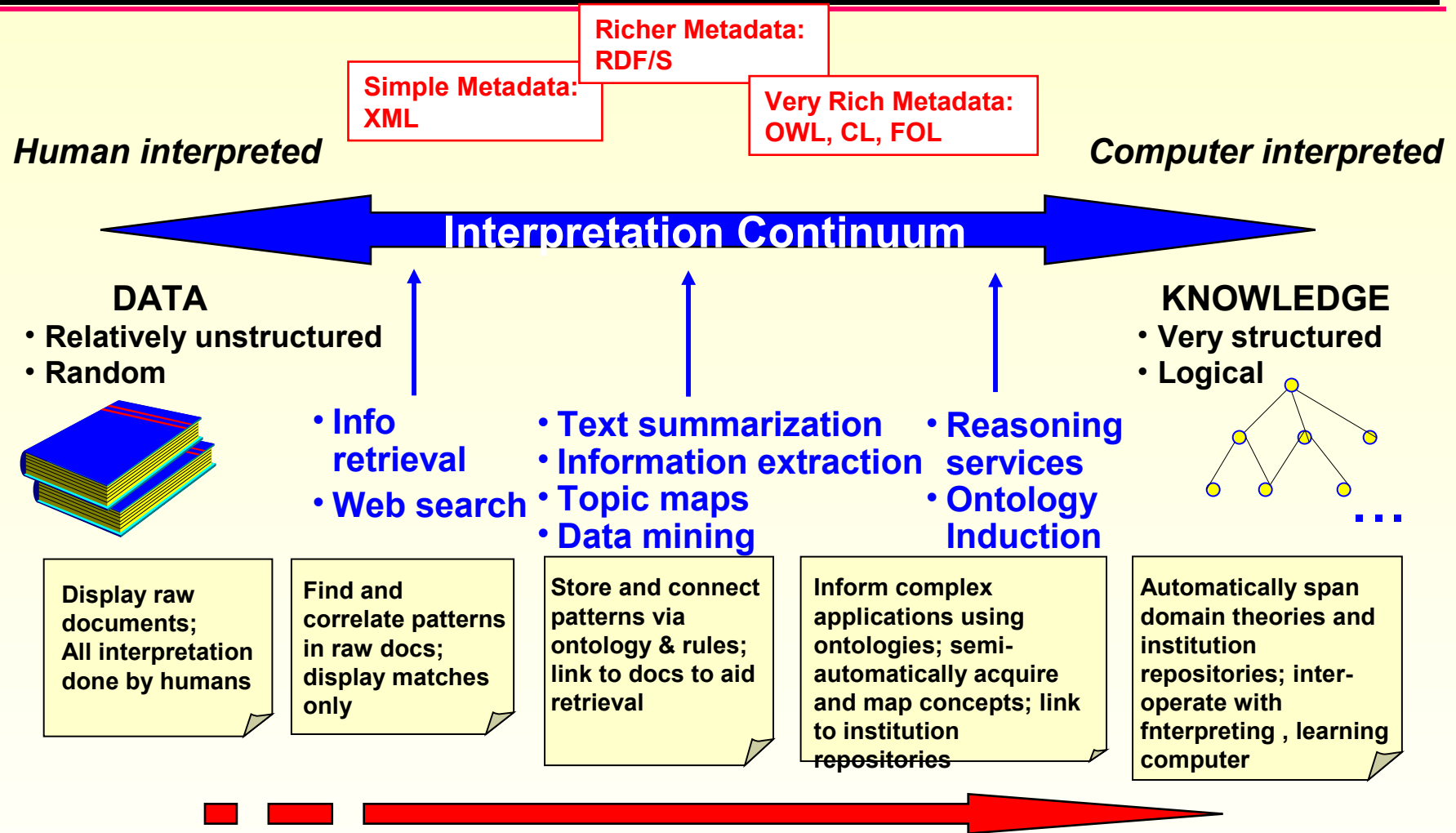
MITRE

Information Semantics Group

Information Discovery & Understanding

Command and Control Center

Advancing Along the Interpretation Continuum

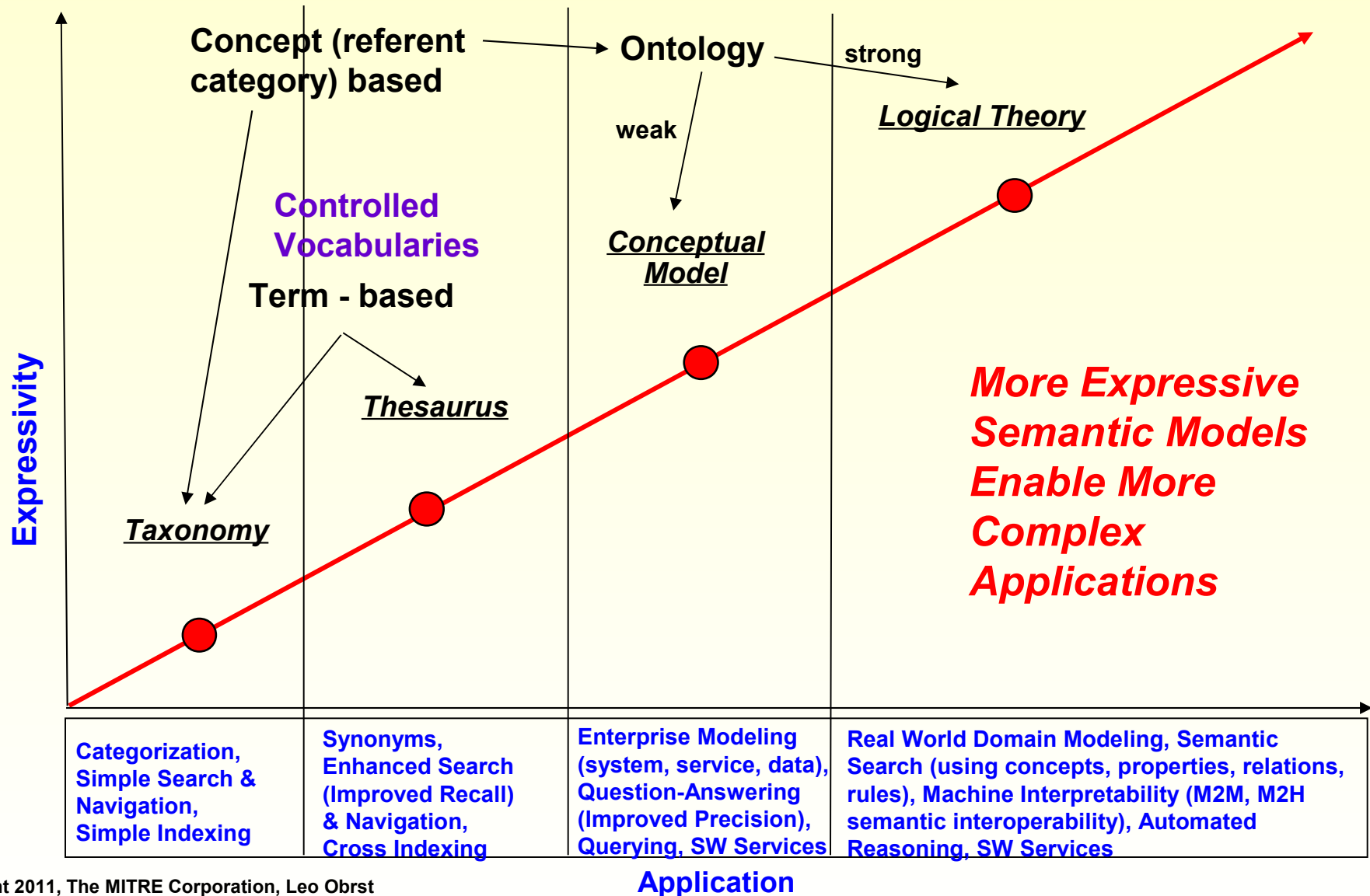


Moving to the right depends on increasing automated semantic interpretation

What Problems Do Ontologies Help Solve?

- **Heterogeneous database problem (data integration)**
 - Different organizational units, Service Needers/Providers have radically different databases
 - Different **syntactically**: what's the format?
 - Different **structurally**: how are they structured?
 - Different **semantically**: what do they mean?
 - They all speak different languages (access, description, schemas, meaning)
 - Integration: rather than N^2 (actually, $N^2 - N$) problem, with single, adequate Ontology reduces to N (actually, $2N - 1$)
- **Enterprise-wide system interoperability problem**
 - Currently: system-of-systems, vertical stovepipes
 - Ontologies act as conceptual model representing enterprise consensus semantics
- **Relevant document retrieval/question-answering problem**
 - What is the meaning of your query?
 - What is the meaning of documents that would satisfy your query?
 - Can you obtain only meaningful, relevant documents?

Ontology Spectrum: Application



Applications for Ontologies

- **Discovery and Mediation**
 - Find relevant data and services
 - Mediate, fuse, compose, and orchestrate
- **Managing Trust, Reputation, Use/Intent, Context, Policy, and Security**
 - Includes data provenance, corroborating identity, entity/identity management
 - Even more important in a cyber world, with thousands of autonomous participants contributing content
- **Improved Language Processing**
 - Information Retrieval and Information Extraction are critical to information discovery and understanding and ontology induction
- **Automated reasoning**
 - Pervasive need for better decision support and more adaptive applications, including simulation, tutoring/training, e-commerce, e-govt
- **Information Mining and Analysis**
 - Finding patterns, trends, clusters, relationships using domain knowledge

What do we want the future to be?

