Moving Semantics into the Mainstream!

It is 2013, Do you Know Where Your Money is?

Dennis E. Wisnosky
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A Block of my Road to the Mainstream!

Past (BMA Federation Strategy version 2.4a)

Present (BOE Execution Roadmap)

Future (BMA Technical Transition Plan version 1)

2005

BEA 3.0

Version 2.4a

Roadmap:
- Architecture
- Governance
- Socialization
- Services
- Infrastructure

Vision & Strategy
Planning & Roadmap
Infrastructure
Governance

2009

DCMO/CIO Policies
- CIO – DIEA, Segment Archi.
- CV & Primitives
- Arch. Fed.
- MDR
- Biz. Intelligence
- Federation Implementation Plan

Initial BOE Experience

Semantic Information

Data Integration
Business Intelligence
Common Vocabulary (Ontologies)
Rules/Workflow
Security

Always Making It Real

2012

BEA 9.x & Beyond

DoD Strategic Mgmt. Plan (SMP)
Performance Measures

Enterprise Standards
- RDF
- OWL
- SPARQL
- other

Data Sharing and BI Enablement

Version 2.4a

DoD Strategic Mgmt. Plan (SMP)

Vision & Strategy
Planning & Roadmap
Infrastructure
Governance

DBSMC/IRBs
DCMO/DCIO; EGB; BECCM

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DoD Strategic Mgmt. Plan (SMP)
A Road to the Mainstream!

The 5-Star Model
Tim Berners-Lee and others - 2010 +
How 5-Star Data Works

1. make your stuff available on the Web (whatever format) under an open license
2. make it available as structured data (e.g., Excel instead of image scan of a table)
3. use non-proprietary formats (e.g., CSV instead of Excel)
4. use URIs to denote things, so that people can point at your stuff
5. link your data to other data to provide context

How Open Linked Data Works!

http://5stardata.info
What Could be More Simple!

I should have thought of this!

Can be Expanded Without Limit!

Courtesy David McComb
Can be Expanded Without Limit

Courtesy David McComb

What I did Think of!
The need for a Common Vocabulary

“Now! That should clear up a few things around here!”

Benefit shown by Example!
Common Vocabulary in Action

DBpedia (Wikipedia) Dataset

DoD AF Wizdom

hasTitle

dennis Wisnosky

hasName

University of Pittsburgh

graduatedFrom

person

writtenBy

book

hasTitle

University of Dayton

hasName

California University of Pennsylvania

hasName

DoD HR Dataset

Wikipedia Data: Who wrote “DoD AF Wizdom”? What is the true meaning of this?

DoD HR Data: Where was Dennis Wisnosky born?

Linked Data: Where was the person who wrote “DoD AF Wizdom” born?

bornIn

Washington

locatedIn

Pennsylvania

yearOfBirth

19XX
Enormous Efficiency in Operations

BIG DATA?
I want what I want,
I want what I need,
I want to know it is right,
I want it when I need it.

(near) Exponential connections (n² – n)

(near) Linear connections (2n-1)

For the data - SAP says each point to point interface costs U$300,000 to build and maintain. Semantic Web Technology reduces the number of connections by orders of magnitude!

Force Directed Graph

And!
Enormous Efficiency in Development

Shift to Connected Intelligence

**Old Paradigm**

- Web 1.0
- Web 2.0

**New Paradigm**

- True Semantic Web 3.0

**Data Silo Era**
- Closed Proprietary & Hard Wired
- Data Trapped in Relational Databases
- High Price to Extract Interoperability
- Software Specialists Build, Modify, Update
- Complexity Drives Costs & Time Higher

**Connected Intelligence Era**
- Open for Interoperability
- Data Intelligently Managed in Semantic Databases
- Built for Interoperability and Collaboration
- Business Analysts Build, Modify, Update
- Complexity Growth Managed. Period.

For the Software – HP says, “Industry figures & case studies show between 40% to 80% reduction in effort and time”!

OK, I Solved the DoD Problem, and then!
An Bigger Personal Problem!

My War was Over!

Or was it!

What had Happened?
Many causes for the financial crisis have been suggested, with varying weight assigned by experts. The U.S. Senate’s Levin–Coburn Report asserted that the crisis was the result of “high risk, complex financial products; undisclosed conflicts of interest; the failure of regulators, the credit rating agencies, and the market itself to rein in the excesses of Wall Street.” The 1999 repeal of the Glass-Steagall Act effectively removed the separation between investment banks and depository banks in the United States. Critics argued that credit rating agencies and investors failed to accurately price the risk involved with mortgage-related financial products, and that governments did not adjust their regulatory practices to address 21st-century financial markets. Research into the causes of the financial crisis has also focused on the role of interest rate spreads.
The Feds Act!

Dodd-Frank 3000 pages

Must be Interpreted by:

- OFR
- CFTC
- SEC
- OCC
- FRB
- ECB
- FSB
The need to create useful data rather than lots of data comes as large global institutions face expenditures ranging from $150 million to $350 million each to comply with post-credit crisis regulatory requirements in the United States, Europe and elsewhere. That is "significantly larger" than the level of expenditures required previously for complying with Sarbanes-Oxley Act, Markets in Financial Instruments Directive and Basel II requirements, from before the crisis", said Javier Perez-Tasso, head of marketing at SWIFT.

Another Report said “with no business value”!
What is Needed!

• “A simplified and replicable method of calculating exposure to risk that can be universally applied to sources of transactions that are reconcilable to accounting records
• Global identification standards for legal entities, products and financial events to facilitate the aggregation and comparison of risk exposure data within and between financial institutions and across the industry
• A ‘Big Data’ framework that is able to provide regulators and others with complete and accurate real-time information relating to the global financial system”

This needs statement is summarized by the Basel Committee as “an intelligent semantic network for systemic risk analysis.”


Orders of Magnitude Simplification of the Problem
Must Solve Problems Like This
What Do You See?

Is it ok for different people to interpret this picture in different ways?
Is it ok for different people to interpret this picture in different ways?
Once upon a time, there were no standard definitions of financial terms and the financial institutions could interpret the meaning of the rules and regulations of the industry each in their own way. Everyday, new financial instruments and transaction types were invented. One day, major companies in business for many decades began to collapse and lead the world into general economic depression. Because of that, regulators struggled mightily to understand the condition of the world’s economy and it became clear that the companies themselves did not know their true financial exposure. Because of that, an effort was launched by the industry to develop a Financial Industry Business Ontology (FIBO) - a common vocabulary based on international standards, that would enable companies to better communicate within and among themselves and would enable regulators to perform meaningful oversight as required by laws. Until finally, the dual purpose of reducing the cost of manufacturing data required by law became de minimis and Congress and regulators were confident of the provenance of answers to their questions of the industry.
Wells Fargo chairs the EDM Council’s Semantic Technology Program, interfaces directly with regulatory authorities and leads the working group that is responsible for constructing the operational capabilities of FIBO.

Deep Technical Five!
What the Bankers and Feds Will See

Financial Institutions

- Legacy Database(s)
- Mapping
- Semantic Information Integration Platform
- Swap Trade & Regulatory Reporting
- FpML

Trading & Compliance System(s)
- Mapping

Institutional Risk Analyst

Ontologies

Swap Data Repository Database(s)

Legal Entity Data Provider(s)

Semantic Information Integration Platform

Informational Sharing across Regulatory Agencies

Regulatory Agencies

- Legacy Database(s)
- Mapping

Swap Data Repository Database(s)

Semantic Information Integration Platform

Legal Entity Data Provider(s)

Semantic Triple Store

Regulatory Risk Analyst

Semantic Network Graph Analysis

Trusted Links to the Semantic Web

Legal Entity Data Provider(s)

Legacy Database(s)

Informational Sharing across Regulatory Agencies

Deepest Technical Five!
Find All Model Instances for All Applicants Who Applied in 2011 and Were Disbursed By Check?

What the Operators Will See

Operational Ontologies
- Data Models
  - Extends Conceptual Ontology Data Model
  - Hosted on a EDMC managed Server

Conceptual Ontology
- Data Model
  - Represents BPMN-2.0 Ontologies
  - Extends IFW Ontology Schema

BPMN-2.0 Ontologies
- Instantiates Process Domain Ontology Schema
  - Type makes Disbursement Sub Process
  - Instantiates IFW Ontology Schema
  - Uses Loan Process Ontology Instances
    - Type Applicant Data Ontology Instances
      - Uses Operational Ontologies Data Models
  - Represents Applicant Data Ontology
    - Extends Conceptual Ontology Data Model
  - Instantiates Applicant Data Ontology Schema

Applicant Data Ontology Schema

Applicant Data Ontology Instances

Loan Process Ontology Instances

Process Domain Ontology Schema

IFW Ontology Schema
Thank you!

Questions?
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