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

Dennis E. Wisnosky
Founder, Wizdom Systems, Inc.
ME!

• Degrees in Physics, EE, Management Science - all part time on a real campus while raising a family
• 5 years private sector, 10 years Gov, 20 years private sector, 5 years Gov and now Wizdom Systems Inc. - reinvented. Google or YouTube or LinkedIn has more than even I know about me.
• Asked in 2006, by the the Sec of Defense to build system that could solve the DoD “where is my money problem”, I accepted.
A Bed Time Story!

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.

Thank you Daniel Pink!
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.

They did not know the Provenance the TRUTH, about their data!
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.

And, They All Lived Happily Everafter!
### My DoD Experience - A Metaphor for FIBO Implementation

#### Past
(BMA Federation Strategy version 2.4a)

- **BEA 3.0**

  - Version 2.4a
  - Roadmap:
    - Architecture
    - Governance
    - Socialization
    - Services
    - Infrastructure

#### Present
(BOE Execution Roadmap)

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

- **Initial BOE Experience**

#### Future
(BMA Technical Transition Plan version 1)

- **DoD Strategic Mgmt. Plan (SMP)**
- **Semantic Information**
  - Data Integration
  - Business Intelligence
  - Common Vocabulary (Ontologies)
  - Rules/Workflow
  - Security

- **Data Sharing and BI Enablement**
  - Enterprise Standards
    - RDF OWL SPARQL other

- **BEA 9.x & Beyond**

- **Always Making It Real!**

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**Vision & Strategy**
- DBSMC/IRBs
- DCMO/DCIO; EGB; BECCM

**Planning & Roadmap**
- DCMO/DCIO; EGB; BECCM

**Infrastructure**
- DCMO/DCIO; EGB; BECCM

**Governance**
- DCMO/DCIO; EGB; BECCM

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DWiz DoD DCMO BMA CTO & CA
We Are on this Path Now!

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

Only the Source has the TRUTH!
How 5-Star Data Works

★ make your stuff available on the Web (whatever format) under an open license¹ example ...
★★ make it available as structured data (e.g., Excel instead of image scan of a table)² example ...
★★★ use non-proprietary formats (e.g., CSV instead of Excel)³ example ...
★★★★ use URIs to denote things, so that people can point at your stuff⁴ example ...
★★★★★ link your data to other data to provide context⁵ example ...

http://5stardata.info How Open Linked Data Works!
What Could be More Simple!

I should have thought of this!

Can be Expanded Without Limit!

Courtesy David McComb
Can be Expanded Without Limit

What I did Think of!

Courtesy David McComb
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**

- **DoDAF Wizdom.**
  - hasTitle
  - writtenBy

- **person**
  - hasName

- **University of California of Pennsylvania**
  - hasName

**DoD HR Dataset**

- **Dennis Wisnosky**
  - hasName
  - yearOfBirth: 19XX
  - bornIn: Washington
  - locatedIn: Pennsylvania

**Linked Data**

- **person**
  - hasName

**Wikipedia Data: Who wrote “DoDAF Wizdom”?**

**DoD HR Data: Where was Dennis Wisnosky born?**

**What is the true meaning of this?**
Enormous Efficiency in Operations

(near) Linear connections \((2n-1)\)

(near) Exponential connections \((n^2 - n)\)

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.

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

And!
Enormous Efficiency in Development
Shift to Connected Intelligence

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."[15] The 1999 repeal of the Glass-Steagall Act effectively removed the separation between investment banks and depository banks in the United States, and investors and financial markets did not adjust their regulatory practices to address 21st-century financial markets.[17] Research into the causes of the financial crisis has also focused on the role of interest rate spreads.[18]
What lessons have we learned from Lehman?

Traders on the floor of the New York Stock Exchange on Sept. 15, 2008, the day of the collapse of Lehman Brothers. (Andrew Harrer, Bloomberg / September 10, 2013)

http://www.chicagotribune.com/business/columnists/ct-biz-0915-phil-20130915,0,5125535.column
The Feds Act!

Dodd-Frank nearly 3000 pages

Must be Interpreted by:

- OFR
- CFTC
- SEC
- OCC
- FRB
- ECB
- FSB
The Industry Cries Foul!

“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 new 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"

Javier Perez-Tasso, head of marketing at SWIFT.
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.”

Must Solve Problems Like This
What Do You See?

Is it ok for different people to interpret this picture in different ways?
What Should You See?

Is it okay for different people to interpret this picture in different ways?

Of course not! The meaning = semantics – of the data must be precisely defined.
— identification of legal entities, their jurisdictions and ownership control hierarchies
— Identification of financial contracts and instruments
— classification and data linkage for aggregation
— actionable risk intelligence

Requires Participation at all Levels
 Enterprise Data Management Council (EDMC) FIBO Participants

✓ 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.

And with the support of Regulators

Deep Technical Dive!
Conceptual Level
— Abstraction is necessary to preserve Operational Options

• Operational Level
— Precision is necessary to ensure consistent and compliant execution
FIBO Business Conceptual and Operational Ontologies are Two Sides of the Same Coin

- **FIBO Business Conceptual Ontologies**
  - Primarily human facing
  - Visual blueprint
  - Standard terms and definitions for business concepts
  - Broad based expressions of conceptual specifications, provenance, linkage and context of business constructs

- **FIBO Operational Ontologies**
  - Primarily machine facing (RDF/OWL)
  - Derived from FIBO Conceptual Ontologies
  - Optimized for performance and scalability. Fewer abstractions. Inferred relations, mappings.
  - Classification, data linkage, validation and semantic query.
  - Deliver executable functionality to fulfill use cases, enable data linkage, transparency and risk analytics

David Newman Wells Fargo  Michael Bennett EDMC
Intersecting Ontologies: Conceptual and Operational

- Use Case neutral
- Meaning expressed in the “Language of the business”
- Formally grounded in legal, accounting etc. abstractions

- Classes and properties
- Definitions
- Namespaces
- Annotations

- Use case specific classes, properties
- Optimized for operational functions (reasoning; queries)
- Addition of rules
- Mapping to other OWL ontologies

David Newman Wells Fargo  Michael Bennett EDMC
What the Bankers and Feds Will See

Financial Institutions

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

Regulatory Agencies

- Legacy Database(s)
- Mapping
- Semantic Information Integration Platform
- Mapping
- Semantic Triple Store
- Maping

- Swap Data Repository Database(s)
- Mapping
- Legal Entity Data Provider(s)

Informational Sharing across Regulatory Agencies

DeepTechnical Dive!

David Newman Wells Fargo

9/17/13

www.wizdom.com
EDMC/FIBO Generic Use Case

Operational Ontologies

Conceptual Ontology

Data Models

Schemas

Operational Ontologies

Represented As

Used

Type

Data Ontology

Instances

Uses

IsA

BPMN-2.0

Ontologies

Uses

Type

IsA

Process Ontology

Instances

Represented As

Instatiates

Process Ontology

Schemas

Other Standards

Built by SME’s using UML and Web Protégé, obeying the EDMC FIBO Foundations Standard

Managed in a Hybrid Cloud by the Operators

Hosted on a EDMC managed Server

Built According to EDMC/FIBO Standards

Published by EDMC as a FIBO Standard

IsA

Instatiates

Process Models

Built by operators using Web Protégé and other tools obeying the EDMC FIBO Foundations Standard

8/28/13

8/28/13

Dennis E. Wisnosky and Mohamed Keshk
Find All Model Instances for All Applicants Who Applied in 2011 and Were Disbursed By Check?

Baby Steps!
FIBO Foundations
OMG-EDMC Draft Standard

FIBO Foundations Ontology

- Common business modeling framework
  - Common relations
  - Goals, Objectives
  - Organizations
  - Law
  - Accounting
  - Roles
  - Agents, People
  - Agreements
  - Control, Ownership

- FIBO Foundations provides the basic conceptual “Glue”
- Common abstractions grounded in law and business

Michael Bennett EDMC
FIBO Business Entities
OMG-EDMC – Draft Spec

FIBO Business Entities Ontology

- Entity Types
- Legal Persons
- Formal Organization
- Corporations
- Partnerships
- Trusts
- Ownership
- Control
- By Function
- Legal Entity ID

- Types of corporate structures
- Organizational hierarchies / relationships

Stay Tuned for Much More!

Michael Bennett EDMC
FIBO Guarantees Sausage
Thank you!

Questions?
Dennis@wisnosky.net
http://www.youtube.com/watch?v=OzW3Gc_yA9A