

Semantic Wikis

Semantic Wikis for Information Management Working Group

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CEO

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Topics

- Intro to SWIM
- Intro to Visual Knowledge
- Quick Overview of Wiki
- Semantics?
- What do we mean by semantic wiki?
- Layering in enterprise information sharing
 - Definition
 - Notional architecture
 - Key capabilities (trust amplifier)
- Deployment Characteristics

S.W.I.M.

- Federal CIO's council on semantic inter-operability SICoP
- Pilot to research and test semantic wiki based solutions
- Collaboration, information sharing and reference knowledge

- Brand Niemann
- Mills Davis
- Elisa Kendall
- Deborah McGuinness
- Conor Shankey



S.W.I.M.

Scope of Users

- All levels of government
- Individuals
- Ad Hoc Groups
- Communities of Interest
- The public



Motivating Use Cases



vs.

2005 Tsunami – rapidly assembled
wiki-based global group



Katrina – Conventional multi level
command and control

Other Gov't Semantic Wiki Initiatives

- US Patent Office Peer Review Process pilot
 - meta-tagging pilot to address backlog of 600,000 patents
- CIA – white paper on semantic wikis
- Building Semantic Webs for e-government with Wiki technology
 - Christian Wagner,* Karen S.K. Cheung and
 - Rachael K.F. Ip

Visual Knowledge

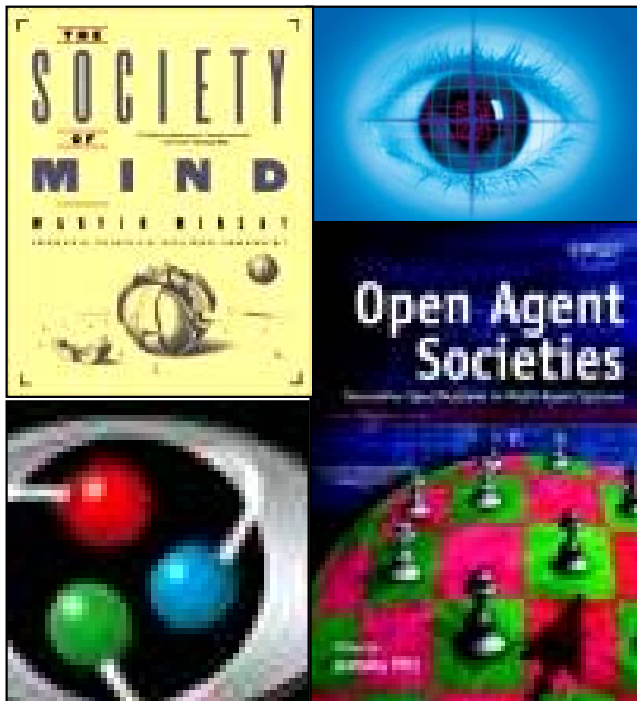
Conor Shankey

- Founder & CEO of Visual Knowledge, 15 years.
- Architected largest corporate wan/lan of it's kind outside US in 1990
- Architected enterprise transactional frame system to supplement/replace mission critical mainframe systems of large power utility
- CTO/co-founder of several spin out companies from Visual Knowledge
- Co-founder Clera Pharmaceuticals, small anti-psychotic drug discovery company
- NCOR technical committee, Chair of 2006 OWL workshop (Intl Semantic Web Conference)

Visual Knowledge

What is our technology?

- Large scale multi-agent software systems



- Agents that are rapidly modeled and evolved by millions of people



Visual Knowledge

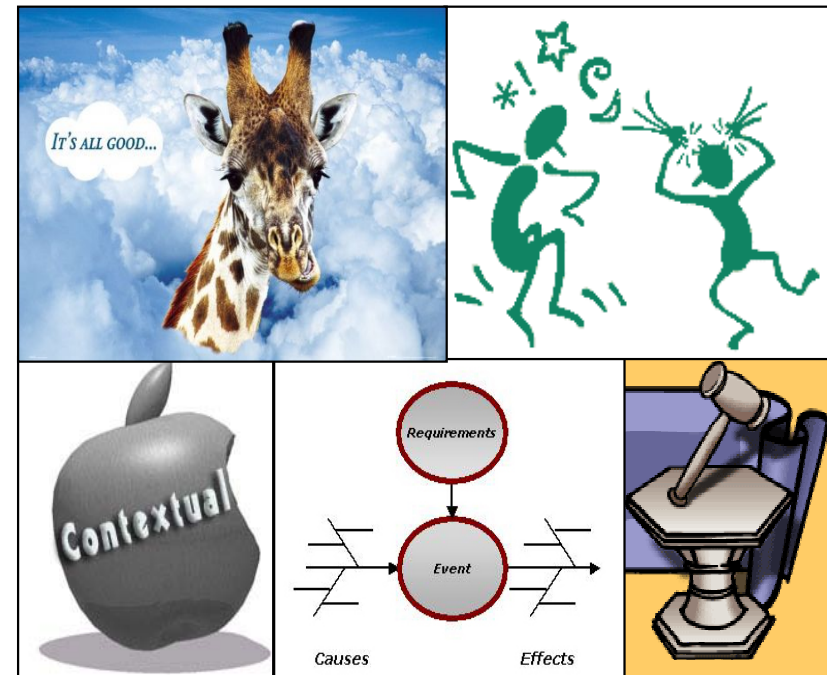
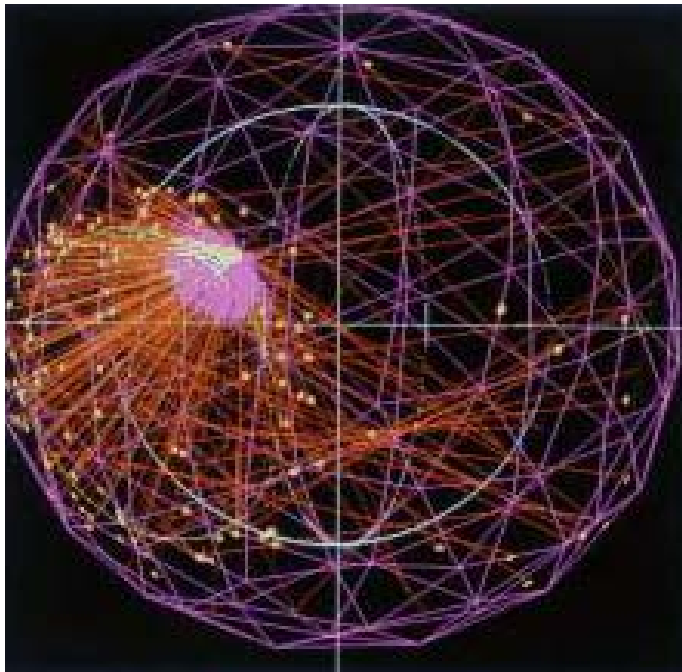
- R&D through real-world implementations



Visual Knowledge

What is our technology?

- Systems of agents that can be federated and can create executable systems
- Agent systems that cope with conflicting ideas, causality and context



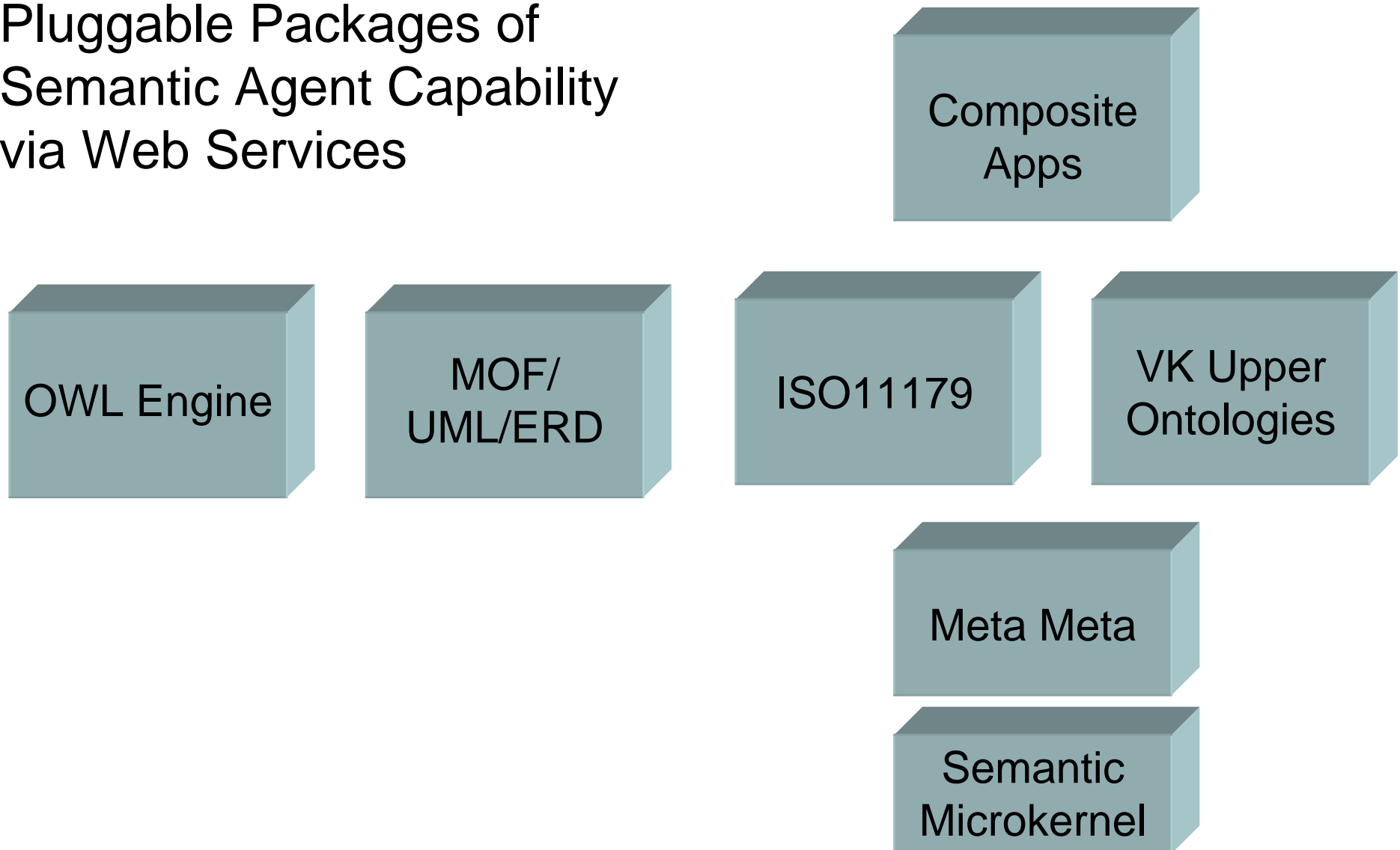
The working units of Visual Knowledge

Semantic agent

- Atom of knowledge, content, and behavior.
- At the most granular level, everything in Visual Knowledge is made up of semantic agents.
- Semantic agents are declarative specifications for services. They are not algorithms. Their DNA is knowledge — knowledge about resources, content, media, language, processes, functions, and how to communicate with other agents.
- Semantic agents collaborate with other agents across platform(s) to provide services and capabilities.
- Semantic agents can be modeled, built, purchased, shared, acquired, and linked together.

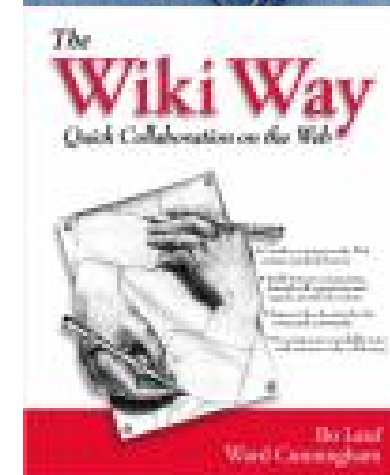
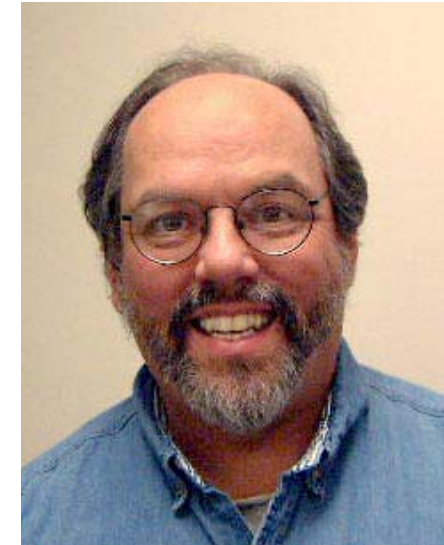
Visual Knowledge

Pluggable Packages of
Semantic Agent Capability
via Web Services

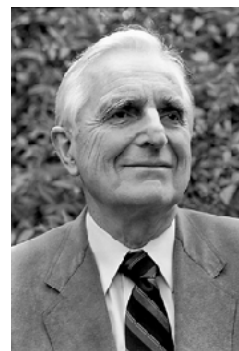


The original wiki idea

- “A web site where anybody could create/edit a web page”
- Structure
 - is not pre-determined
 - invented & evolved by community
 - neither top down or bottom up
- Quick collaborative writing
- Non-linear Hypertext



5/2/2000

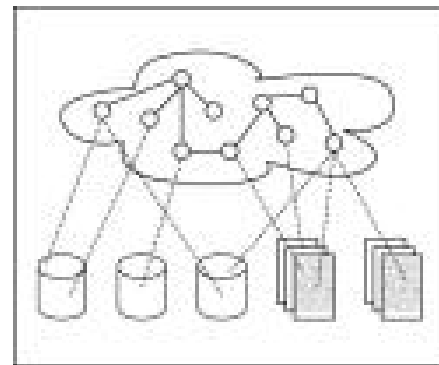


Additional Notions

- Very simple markup for authors
- Any page can be immediately revised assuming you have the right privileges
- All changes are audited and transparent to the community
- “Concepts” in text can immediately become active resources (pages/links)

The word "Simplicity" is written in a colorful, multi-colored font (red, orange, yellow, green, blue, purple) with a shadow effect underneath.

5/2/2006



962 000+ articles

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Benefits of the wiki idea

- Distinct concepts or topics are built on the fly
- Discourse forms around or in the context of a topic
- Eliminates serialized document work flow
- Team or community members can immediately see commentary in the context of a topic

Agility

Consensus

Speed

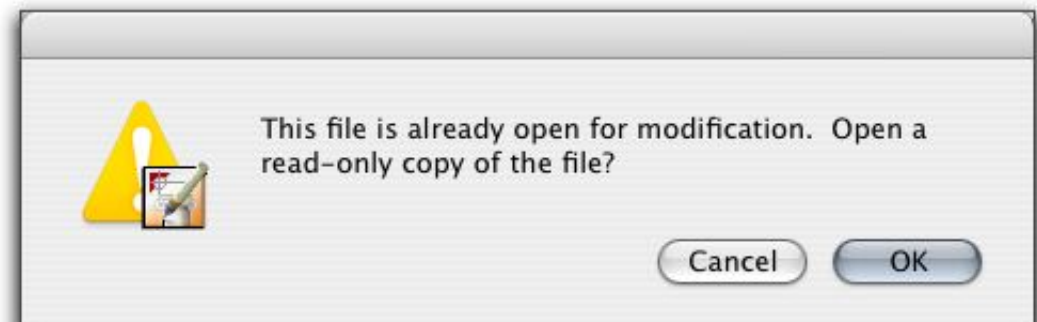
Cohesion

Compared To...

- Each person edits a copy of the document
- A poor soul merges the results
- Expensive file shares
- E-mailing bulky documents
- “Versions” of opaque documents everywhere
- “Organizing” documents in hierarchal file system

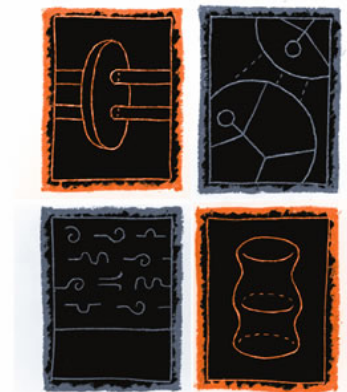


version?



Greatest Strength and Weakness

- Topics or concepts lack semantics
 - A WikiWord is just a WikiWord
 - A page with related formatted text and WikiWords
 - Authored, versioned content
 - Instance based security
 - Arbitrary structure
- Quick and open architecture and adoption led to lack of standardization
- Security?



Semantic?

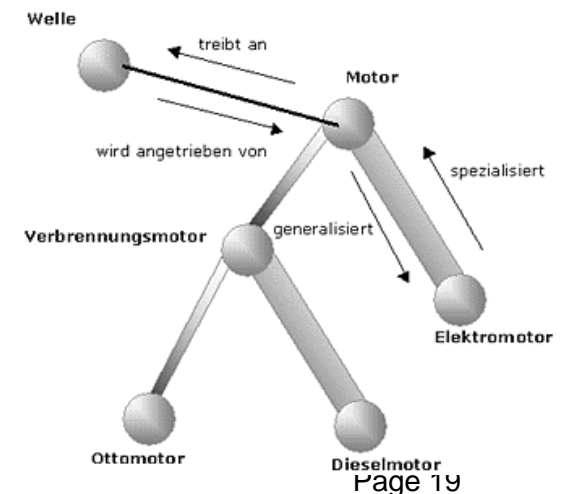
(It's what we do every second of the day.)

- Convert data into something we can comprehend
- By developing or applying concepts
- Quickly relating them to instances in the world
- Applying and revising our world models
- Sharing our models with others



How do you do semantics?

- Generalization
 - organizing concepts by kind
- Aggregation
 - Aggregating complexes into simpler concepts
- Common Properties
 - Relationships (connecting properties)
 - Attributes (flat properties)
- Naming Conventions
 - Terms / Phrases
 - Language



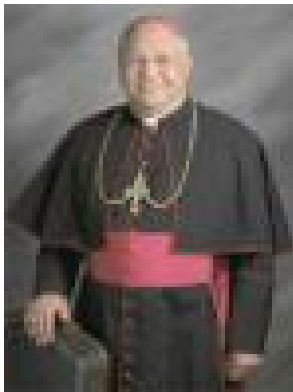
That Sounds like Meta Data?

- **Very Similar**
- **Meta Data**
 - focuses on serving the implementation paradigms of the system
 - Is the semantics of the data structures in an information system

System Paradigm	Meta Data
Relational	ERD
Object Oriented	UML
XML Documents	XSD, XMI

Taxonomies and Vocabularies

- Close
- One hierarchy of terms of concepts
- Permit only one accepted notion of a term



Brother?
Brother?

What else do semantics provide?

- Contextual Meaning
- Inferred Relationships
- Causality
- Granularity

Context, ...

Water on mars?
Water on mars?



Space Exploration
Space Exploration



Food
Food

..., How is this relevant to Information Sharing?

- In a large agency there are 10,000s of databases
 - Millions of data elements
 - Millions of documents
 - Privacy, Security and Power
 - Consuming Objectives
-
- ...But Wordnet only has ~300,000 concepts

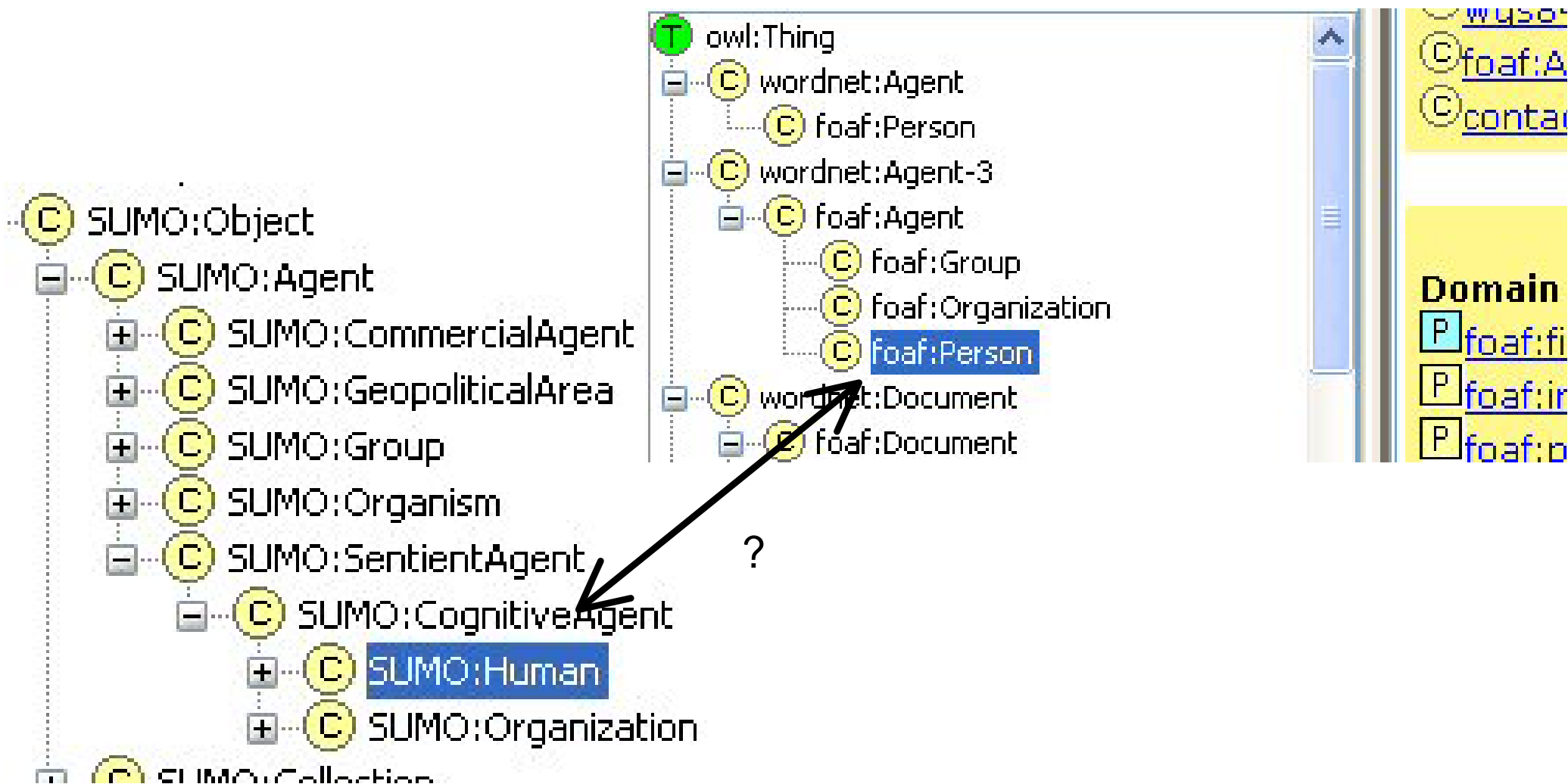
Harmonizing Data Elements to Concepts

PERSON
F_NAME
L_NAME

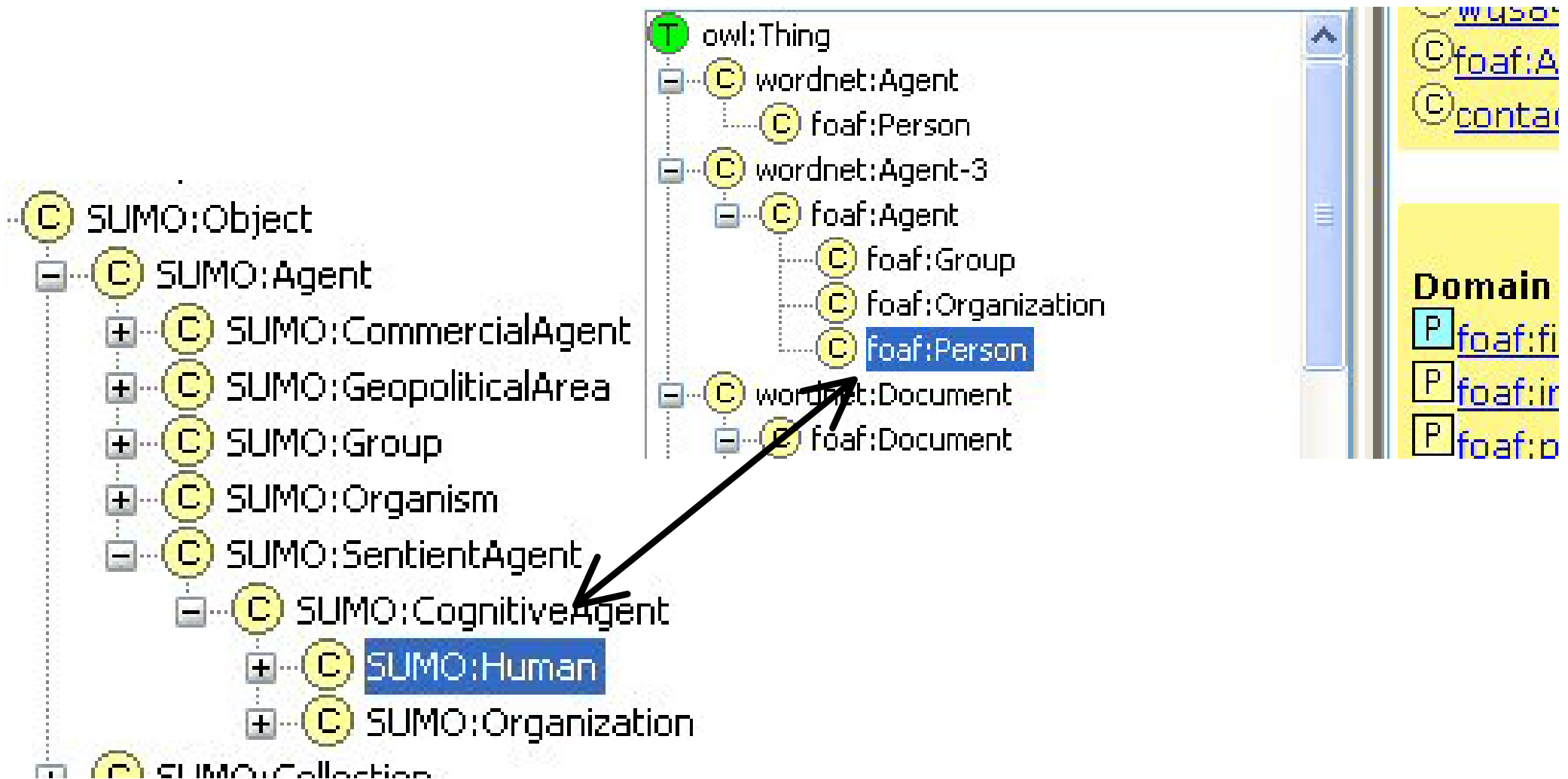
?

The screenshot shows a software interface with two main panels. The left panel displays a class hierarchy starting with 'owl:Thing' at the top. Underneath, there are several categories: 'wordnet:Agent' (containing 'foaf:Person'), 'wordnet:Agent-3' (containing 'foaf:Agent', which further contains 'foaf:Group', 'foaf:Organization', and 'foaf:Person'), and 'wordnet:Document' (containing 'foaf:Document'). The 'foaf:Person' entry under 'wordnet:Agent-3' is highlighted with a blue background. The right panel shows a list of domain elements. At the top, there are three entries: 'foaf:Agent (Delete)', 'contact:Person (Delete)', and 'Domain (Add)'. Below these are three property entries: 'foaf:firstName (Delete)', 'foaf:interest (Delete)', and 'foaf:pastProject (Delete)'. A large black arrow originates from the 'foaf:Person' entry in the left panel and points towards the 'PERSON' concept in the table above. A question mark is positioned above the arrow's path.

Alignment of ontologies



Ontology and MetaData can be Technical



But aligning even the simplest models may require human dialog

Water on mars?
Water on mars?



Space Exploration
Space Exploration

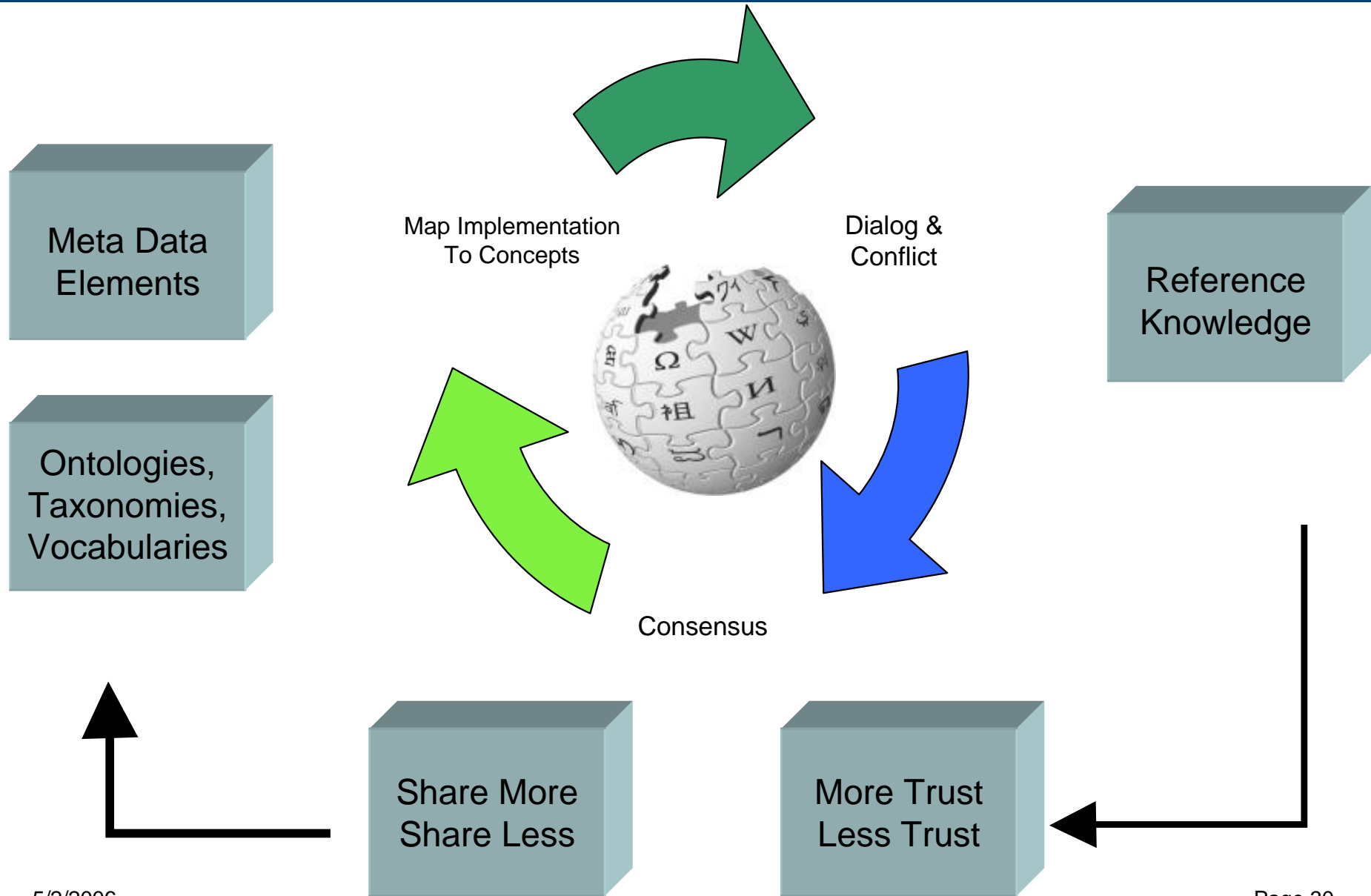


Food
Food

The need

- Standards agnostic
- Completely pluggable
- Harmonization center for meta data and ontologies
- “Soft” wiki layer that invites user collaboration and discourse
- Configurable governance
- Federated change management

Federated Trust Engines



Deployment Characteristics

- Community Servers
- Enterprise Servers
- Team Servers
- Semantic Desktops

- Light
- Agile
- Portable
- Federated

Who Benefits?

Individual	Ad Hoc Groups	Formal Groups COIs
Organize and access what matters to me	<ul style="list-style-type: none">• Quickly assimilate• Group authoring• Federated response	<ul style="list-style-type: none">• Governance• Management• Knowledge Reference• Controlled Publication

Summary

- Large organizations require a new way to share information
- Wikis provide an ideal way to collaborate
- Semantic wikis can be used to harmonize ontologies and meta data
- Federation, change management, security and governance are essential
- If you would like to beta, please contact
 - cshankey@visualknowledge.com
 - mdavis@project10x.com