Taming Complexity in the Financial Services Industry

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Semantic Arts

- Small consulting firm, specializing in helping large organizations apply semantic technology to their enterprise architectures

Semantic Arts' Clients

What do you get when you cross the Godfather with a Financial Analyst?

What do you get when you cross the Godfather with a Financial Analyst?

They'll make you an offer you can't understand

Semantics

- -> greater understanding
  - -> more agreement
    - -> opportunity to simplify

Look at Three Examples

▸ Sallie Mae

▸ A Large Investment Bank

▸ Washington Secretary of State

SallieMae®

- Leading provider of student loans
- We built an Enterprise Ontology for them in early 2009.

Their existing loan servicing databases

	tables	attributes
Class	582	10,230
LoanCons	133	15,295
Eagle I	356	13,538
Eagle II	464	12,502
	1,535	**51,565**

These are the number of distinctions being made in the current systems

Sallie Mae Enterprise Ontology
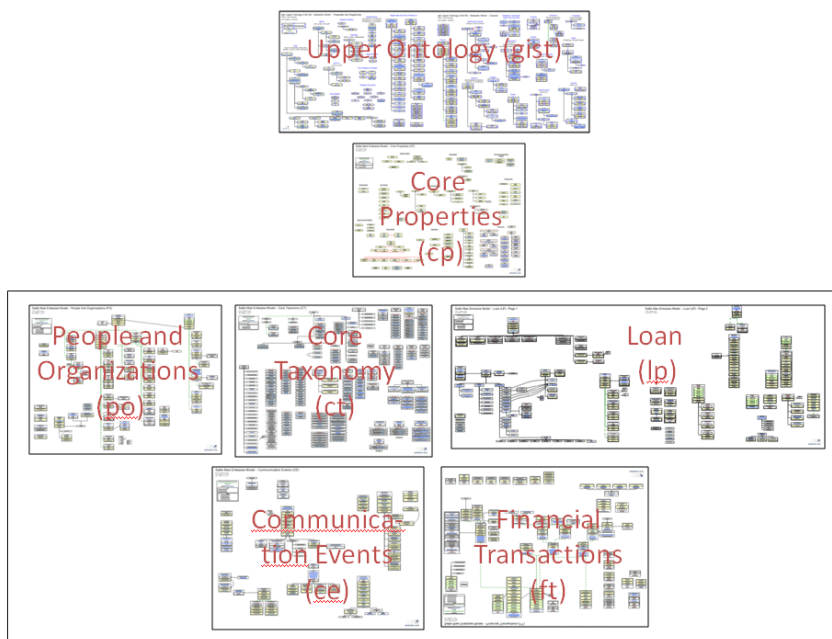
Classes	574
Object Properties	250
Data Type Properties	38
Total T-Box Axioms	**1470**

The original goals of the Sallie Mae Enterprise Semantic Model were to:

▸ Create formal business definitions of the principal concepts in use across the organization.

▸ Validate the model against existing data bases and interfaces, and start the process of formally describing the existing data using those enterprise definitions.

▸ Provide a basis for integrating structured and unstructured data.

Pivot – used to harmonize new service /SOA

Visio Authoring

OWL

Apply

Analyze

Change Request

Canonical Model

SOA Messages
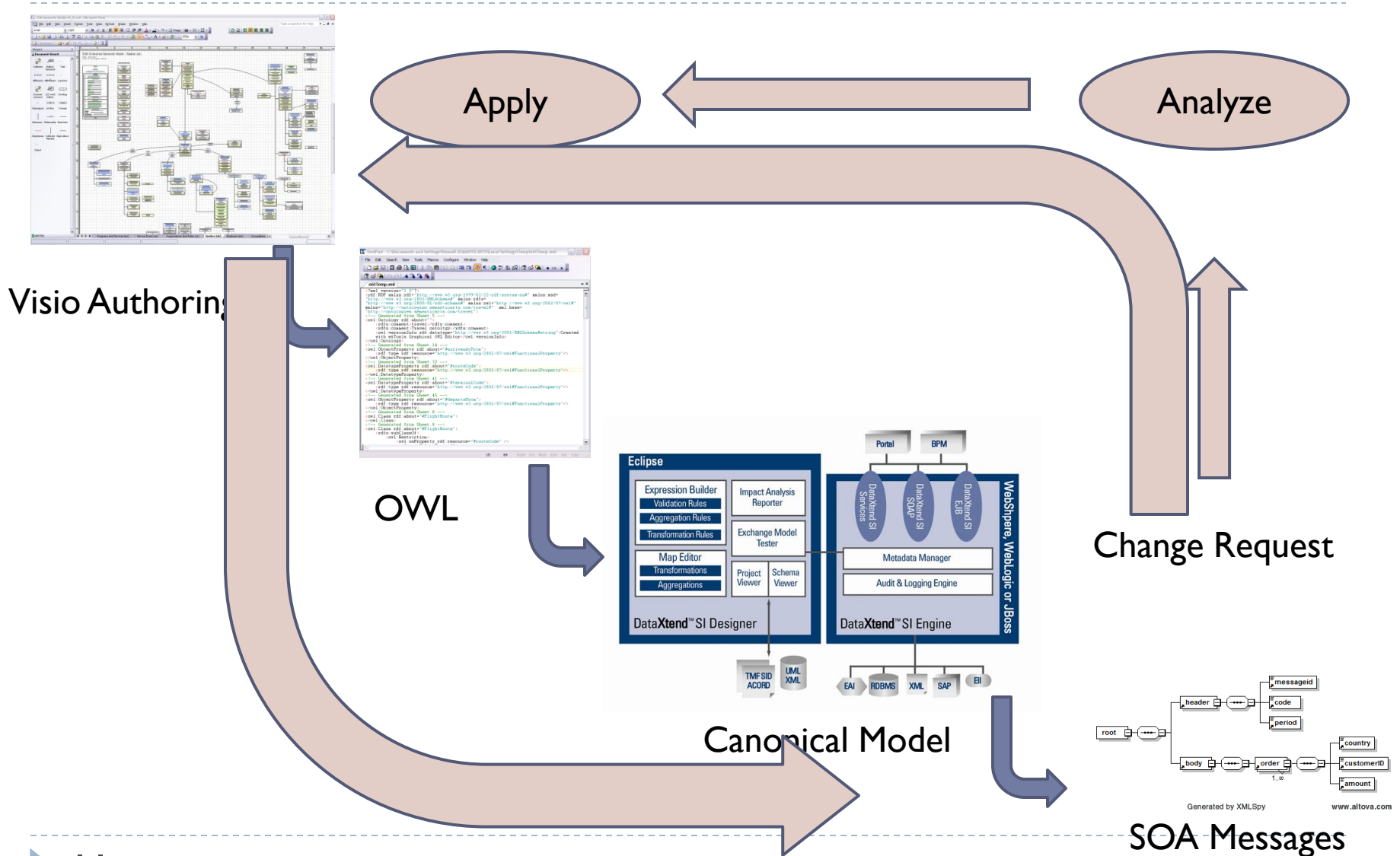
Original Ontology

▸ Grew

▸ But not by much

▸ Surprising that you can take 90% of the complexity out and still have most of what you need

Investment Bank

- Activity Based Costing for Operational Expenses (700 activities)
- 5000 Risk Assessments reviewed per quarter
- An almost infinite number of possible paths through the back office to clear a trade
- An ontology + small faceted taxonomies leveraged off the ontology lead to a 10 X reduction in complexity in each of the areas examined

WA Secretary of State

- Existing system consists of 250 tables and 3000 attributes
- This is primarily dealing with Legal Entities and their registration
- New design, more powerful has 109 classes and 99 properties
- Again a 10 fold reduction in complexity

Complexity reduction

▸ In each of these cases we've reduced ontological complexity by at least 90% without significant loss of fidelity

▸ How is this possible?

▸ How is this necessary?

How is this necessary?

- In traditional design we have collectively developed some very dysfunctional ways of dealing with complexity

- The first thing we do, is anytime we come across something slightly different, we create either a new attribute or a new table

- We keep doing this until the complexity of the design we have exceeds our ability to understand it and/or implement it (which are generally the same thing)

How is this necessary?

- The larger the organization, the smaller the scope of an application that rises to that level of complexity
- The prevailing approach has been to keep adding applications (purchased or built) with un-coordinated schemas
- And then attempting to integrate them later
- This is what gives rise to hundreds of thousands of attributes
- And excessive integration budgets

How is this possible? (how do we reduce the complexity)

- There is a temptation to try to semantically describe all the complexity you encounter
- This is a lot of work
- And worse, it tends to cause you to go into agreement with the existing schema
- That is, the existing schema sounds reasonable

How is this possible? (how do we reduce the complexity)

- We start with people.
- SMEs and analysts who understand the data (not just the data bases)
- And we use "gist" to force us to be much more economical in creation of new concepts

Get gist from our web site
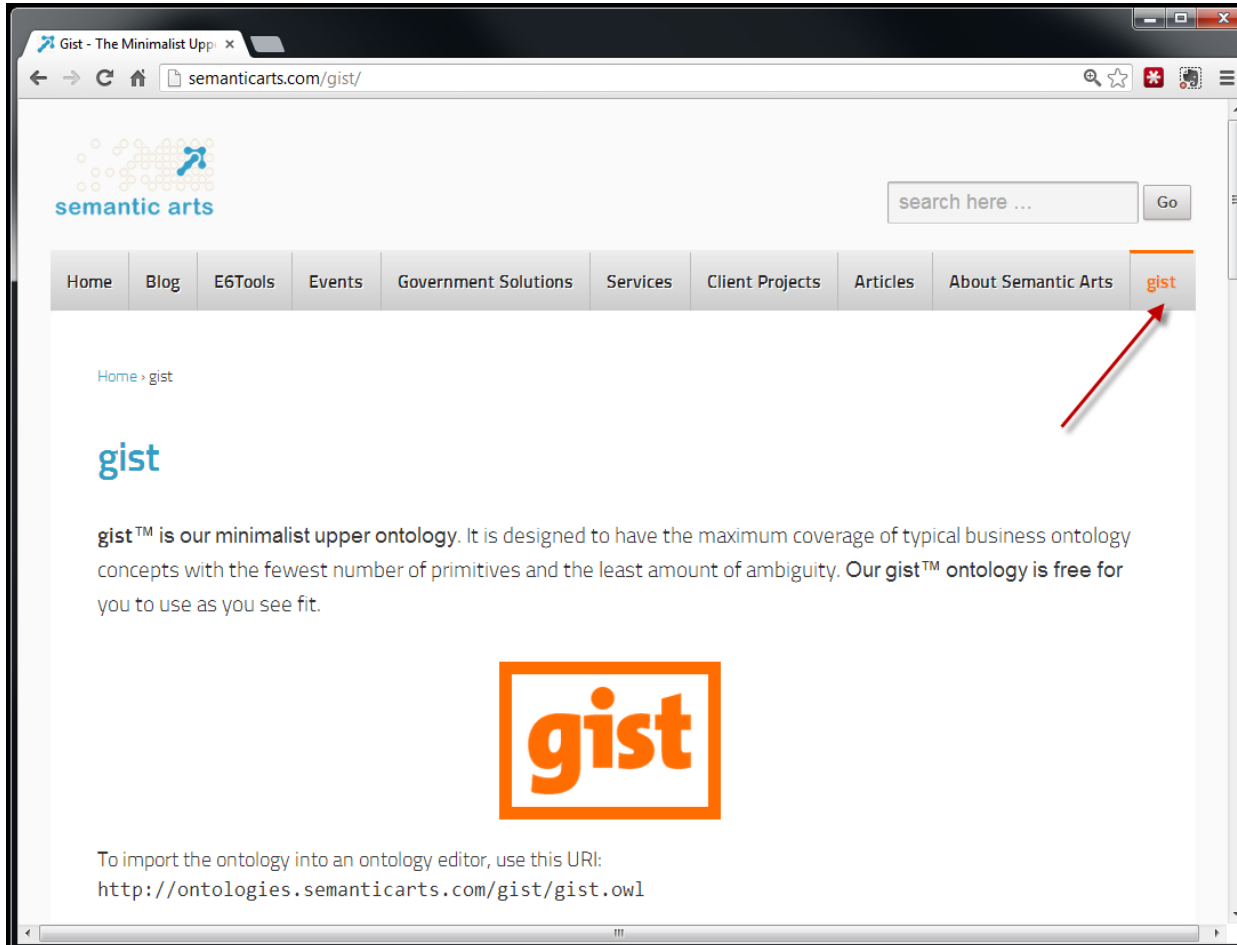
(www.semanticarts.com/gist)

gist – Major Families of Classes

UnitOfMeasure

Magnitude

Other (Collections, Concept, Language)

Time

Place

Landmark

Person

Organization

Stuff

Documents

Agreements

Events

Intention

Gist 8.0 (coming soon)

- 113 classes
- 80 Object Properties
- 20 Datatype Properties

- Much more modular 15 very small modules, each easy to understand
- Use which portions you need
- Easier to integrate with other ontologies

How this helps

- After about a dozen projects we've become confident that most of the concepts we come across are covered

- Forcing us to think deeply about what the concepts we uncover really are helps reduce ambiguity

- But forcing us to define them in this small subset forces us to bring together the similar to where we are forced to confront them.

Summary

▸ We now know that the complexity in the financial services industry is no different from that in every other industry

▸ The economic value of these three is very significant

> ▸ -> greater understanding
>> ▸ -> more agreement
>>> ▸ -> opportunity to simplify