

Taming Complexity in the Financial Services Industry

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November 2013

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

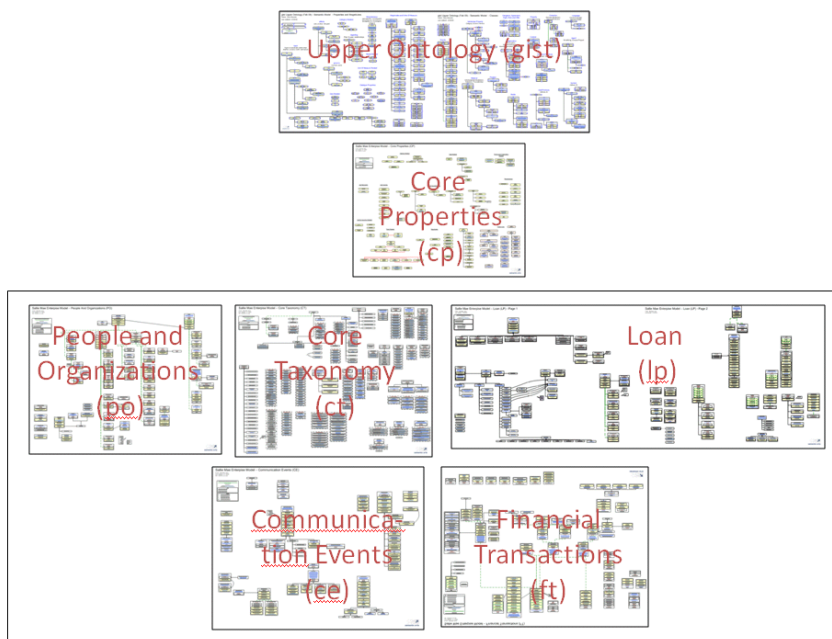
- ▶ Leading provider of student loans
- ▶ We built an Enterprise Ontology for them in early 2009.

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

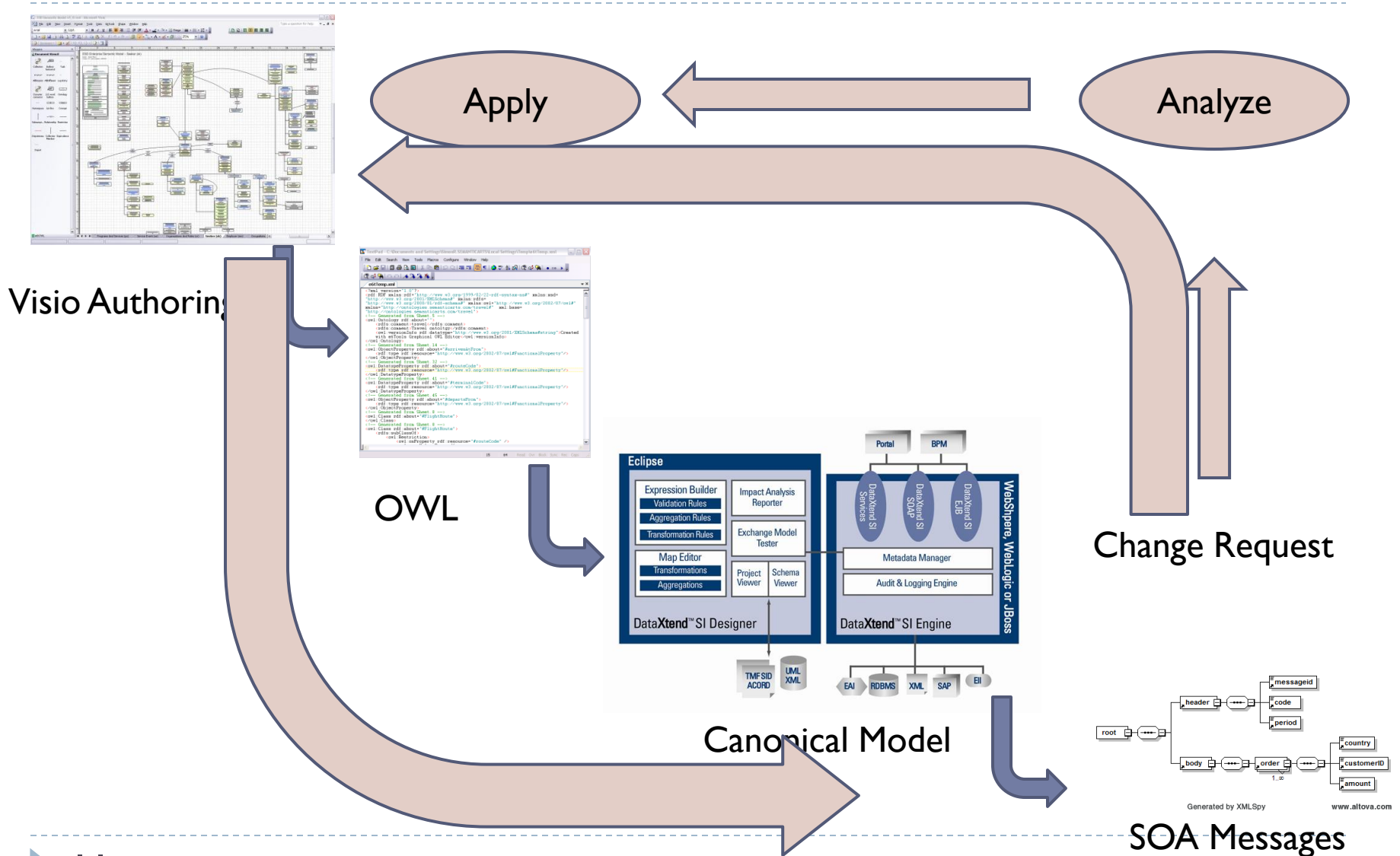


Classes	574
Object Properties	250
Data Type Properties	38
Total T-Box Axioms	1470

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



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

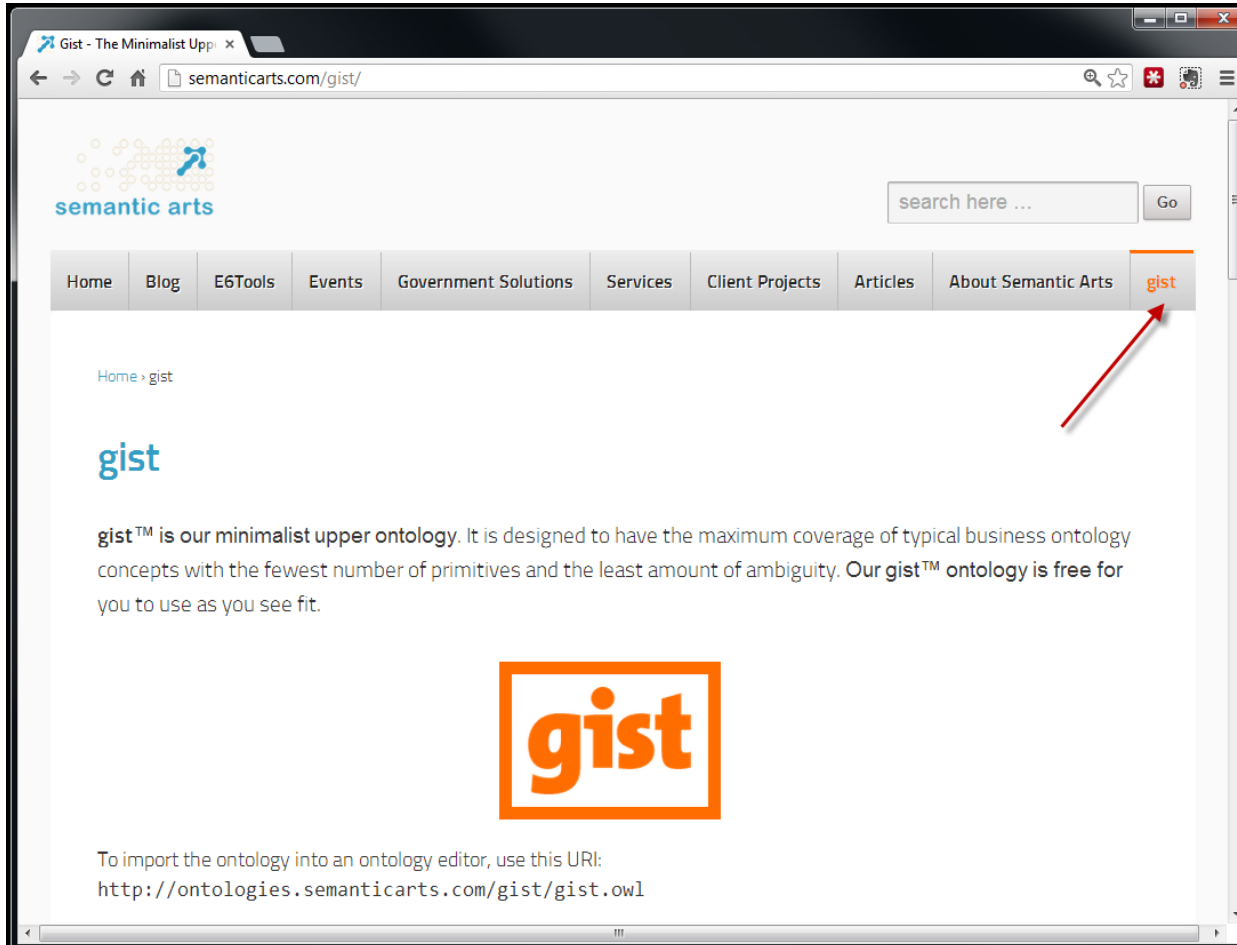
How is this possible? (how do we reduce the complexity)

- ▶ 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