Semantic Interoperability Levels for Comparing Use Cases

Describing Value-Add of Semantic Web Design Using a Practical Interoperability Scale

Implementing W3C Semantic Web Standards for Interoperability

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FacetApp

Problem

Articulating the Interoperability Value Proposition.

Getting Funded.

Business IT Gap

Business

IT

Business Expert's Perspective: Processes

IT Implementation Perspective

This Benefits You

Business

- **For**: Business Decision Makers
- **Who Need**: Tool that Gets the IT Team to Put the Interop Benefits in a Clear, Concise Presentation.

IT

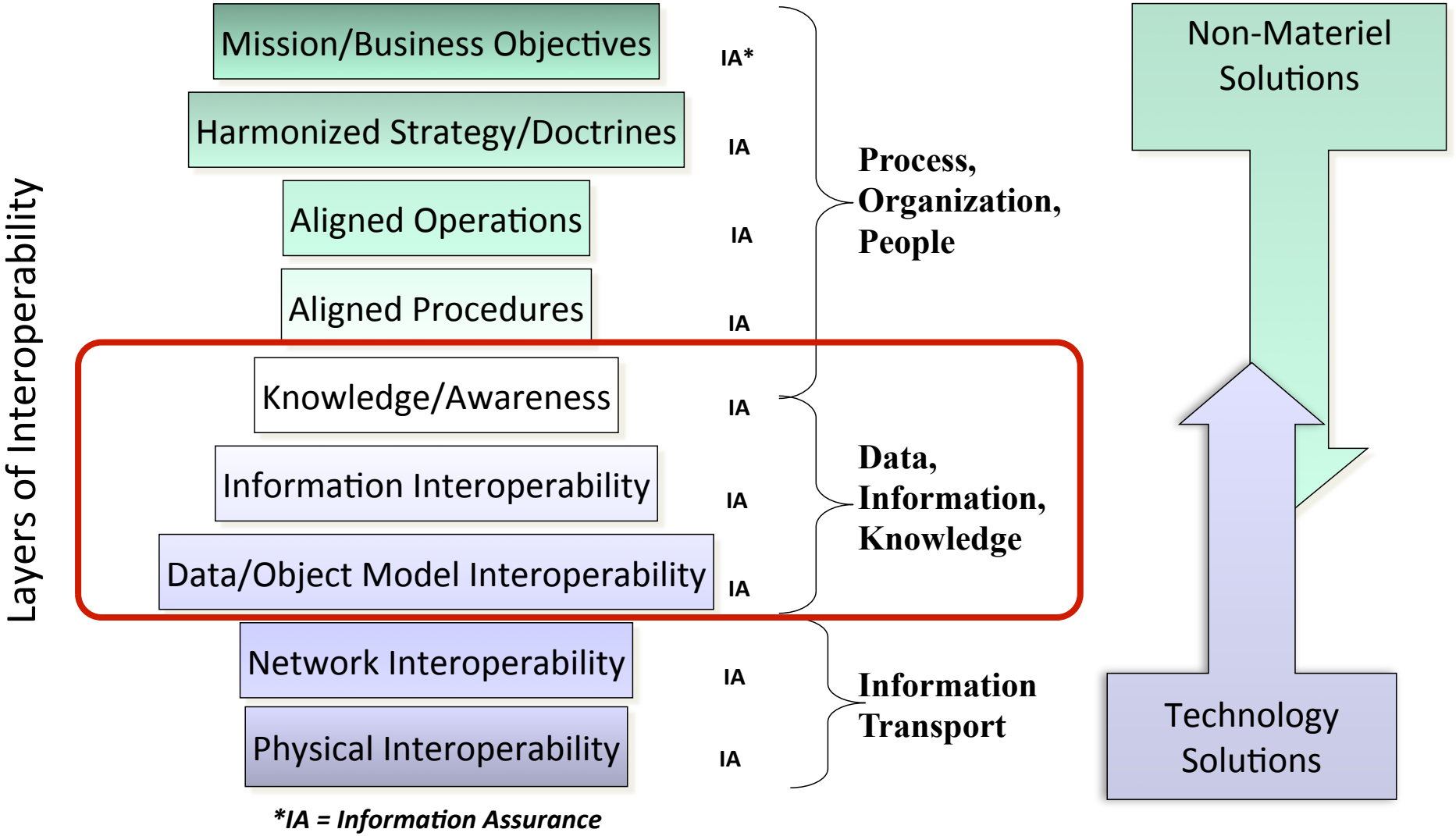
- **For**: CIOs, IT Architects, IT Project Managers
- **Who Have**: Interoperability Project or Technology
- **Who Need:** Means to Communicate Interoperability Value Prop to Business Decision Makers
- **So they can**: Get Funded, Get Paid, Solve Expensive Interoperability Problems.

A Current Method

"Measure for Merit for Coalition Interoperability"

Interoperability Model:

A composite of Materiel & Non-materiel solutions



Adapted from "Beyond Technical Interoperability – Introducing a Reference Model for Measure of Merit for Coalition Interoperability'. Dr. Andreas Tolk, VMASC, ODU. 8th CCRTS , NDU , June 2003

Comparing Use Cases

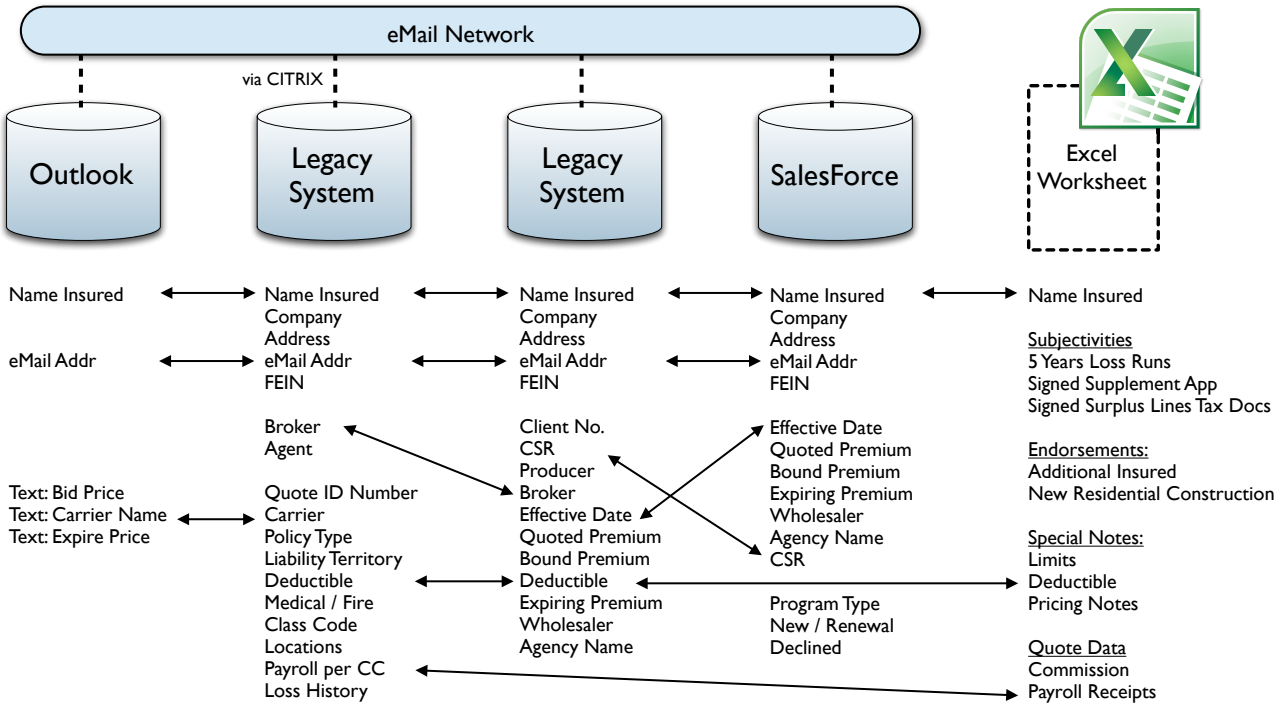
Situation: Legal Contract Management System

Client Situation

Managing Data & Rule Complexity

Client Data Alignment Problem

Goal: Understand Situation & Context

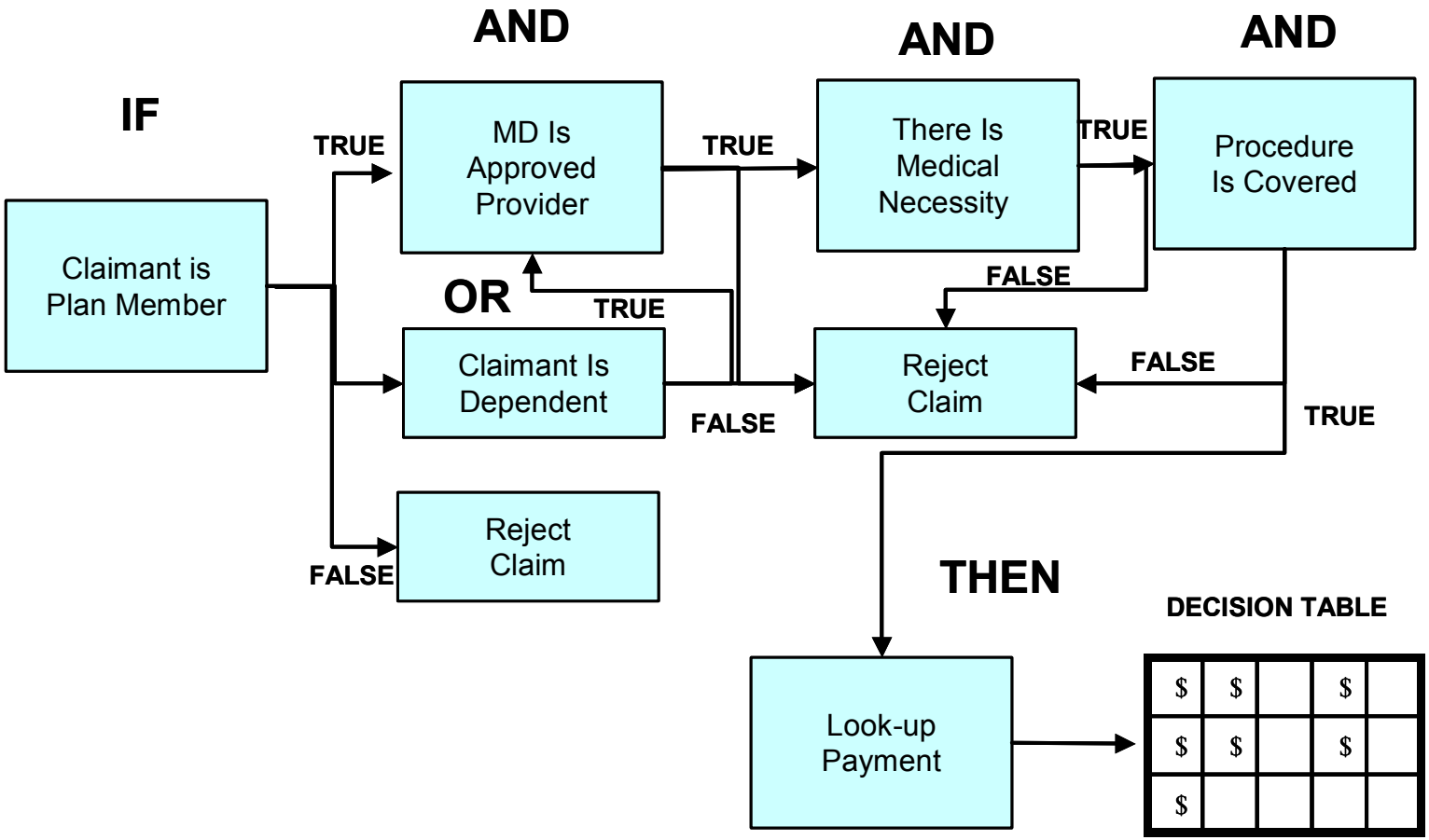


Rules Drive the Business

The Ability to Manage Rule Complexity Determines Success or Failure.
Risk vs. Loss.

Business Rules Drive Integration Costs

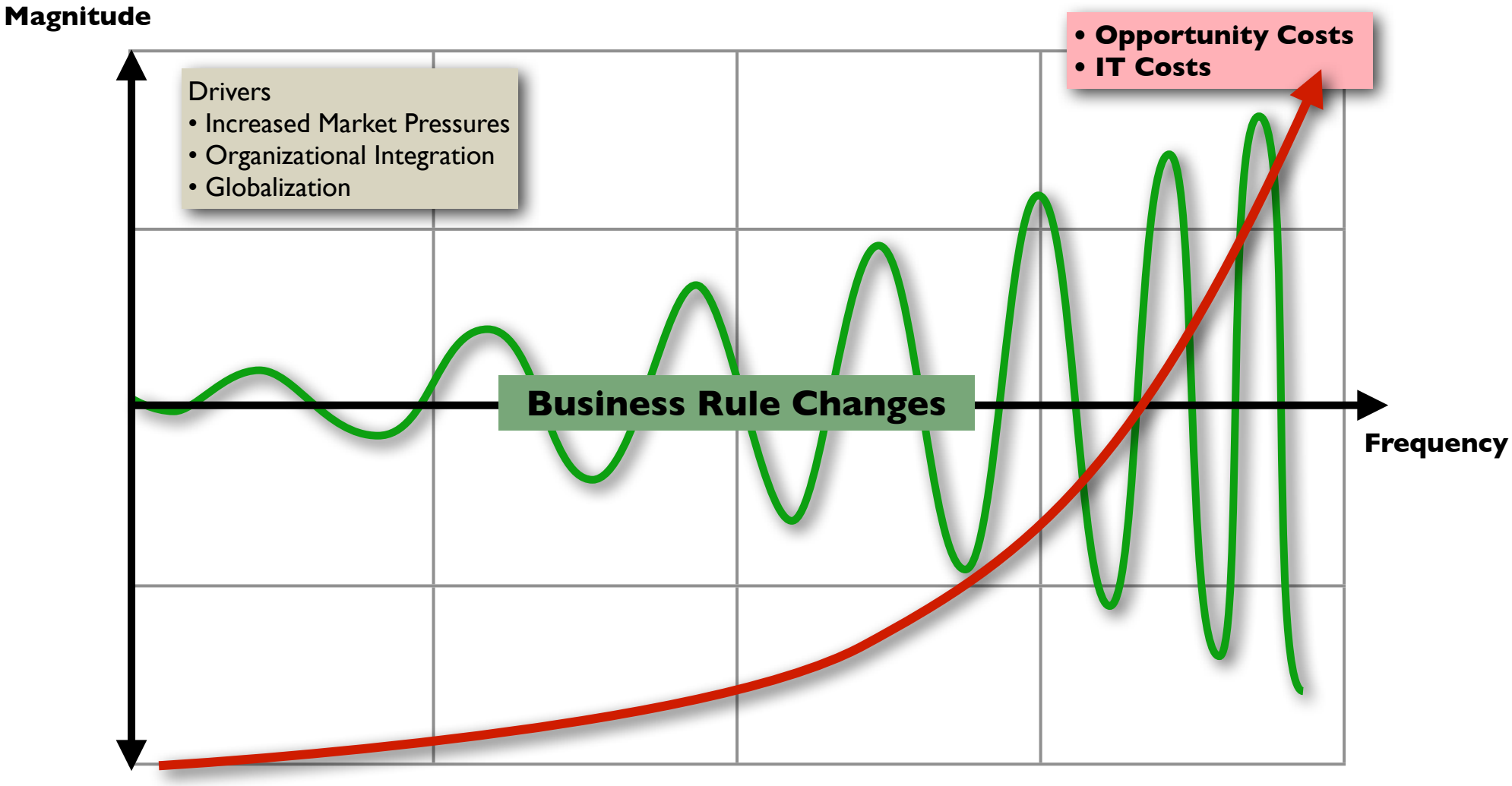
Figure 1: A Medical Claim Rule Set



Source: Celent Analysis

Rule Change is the Norm

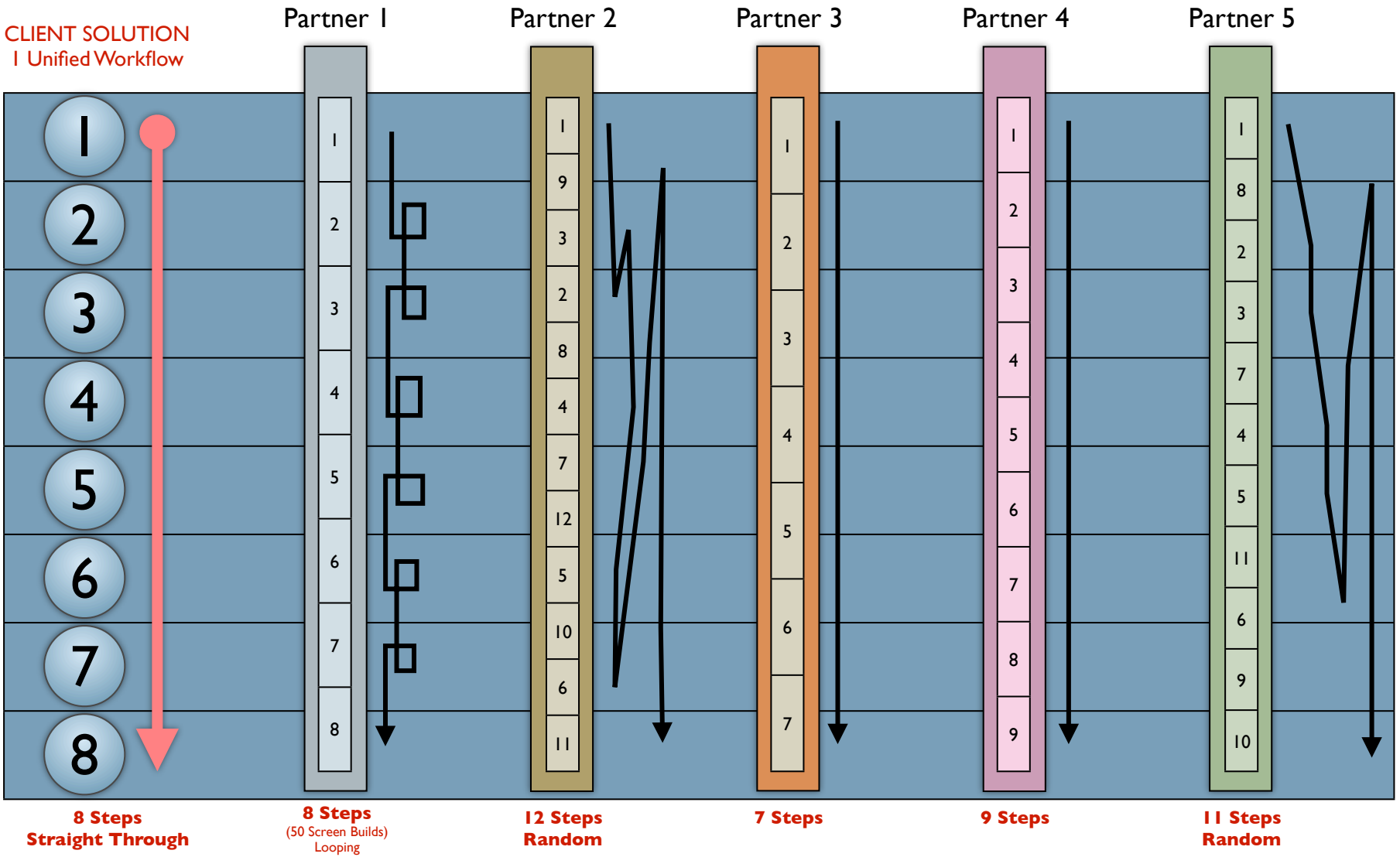
Rules Become more Complex and Change More Frequently



Source: Gartner, Pega

Rules Enable Unified Workflows

Answers these Questions:
What needs to be done?
Who is supposed to be doing it?
Who is approved to share work in what step?



Solution

Interoperability for: Rules, Workflows, Data

based on **W3C** Semantic Web Standards

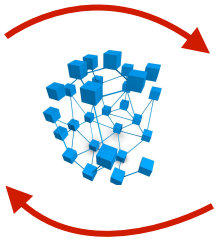
Interoperability Drives Value

Connect Industries & Governments

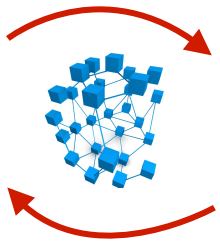
HealthCare

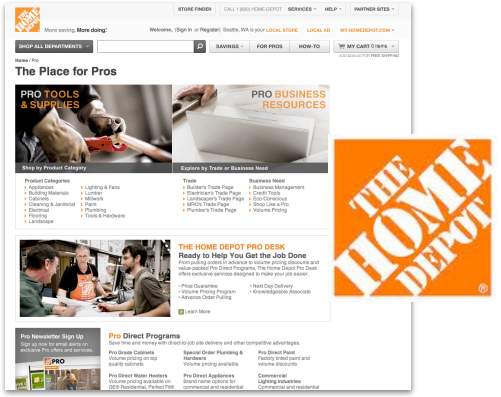
Insurance

eCommerce



Drywall Contractor





Contractor Materials

Solution Strategy

Step 1: Specify the UI Specs & Data

Mockup Screens
Identify Workflows, Business Rules, Data Model
Import & Verify Data Preserving Original Semantics

Step 2: Build a Common Knowledge Model

Connect Classes, Infer Data Structure
Import Instance Data, Browse
Build Screens Adding Rules & Workflows to complete the App

Step 3: Access Your Connected Knowledge

Facet Browse Data with Speed
Navigate Workflows
Access Remote Data, Enter New Data

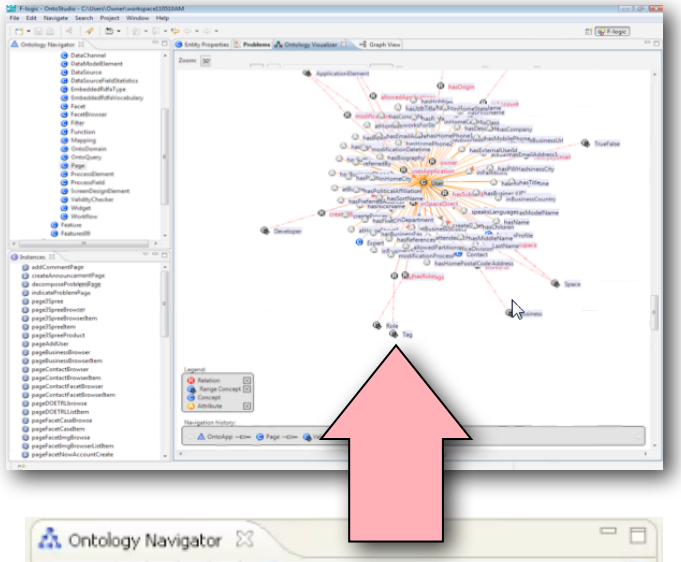
Step 4: Extend with Confidence

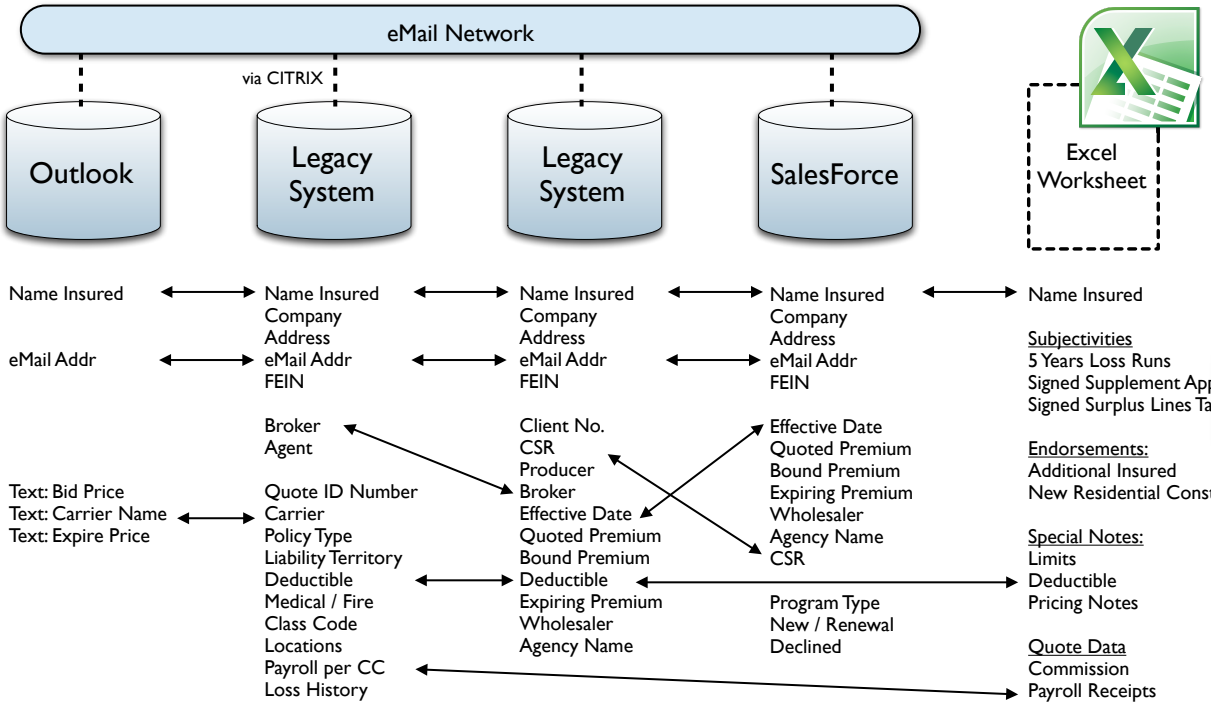
Accounting, Billing, Business Dev., IT, Brokers, Policies, SalesForce
Knowledge Model Grows to be Richer, More Connected
Access Data From Everywhere

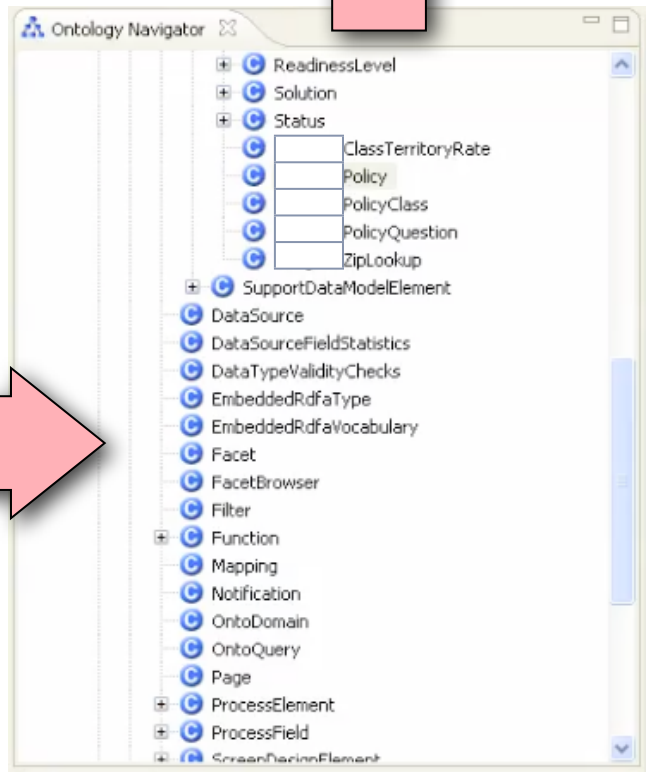
Step 2

Get a Common Knowledge Model

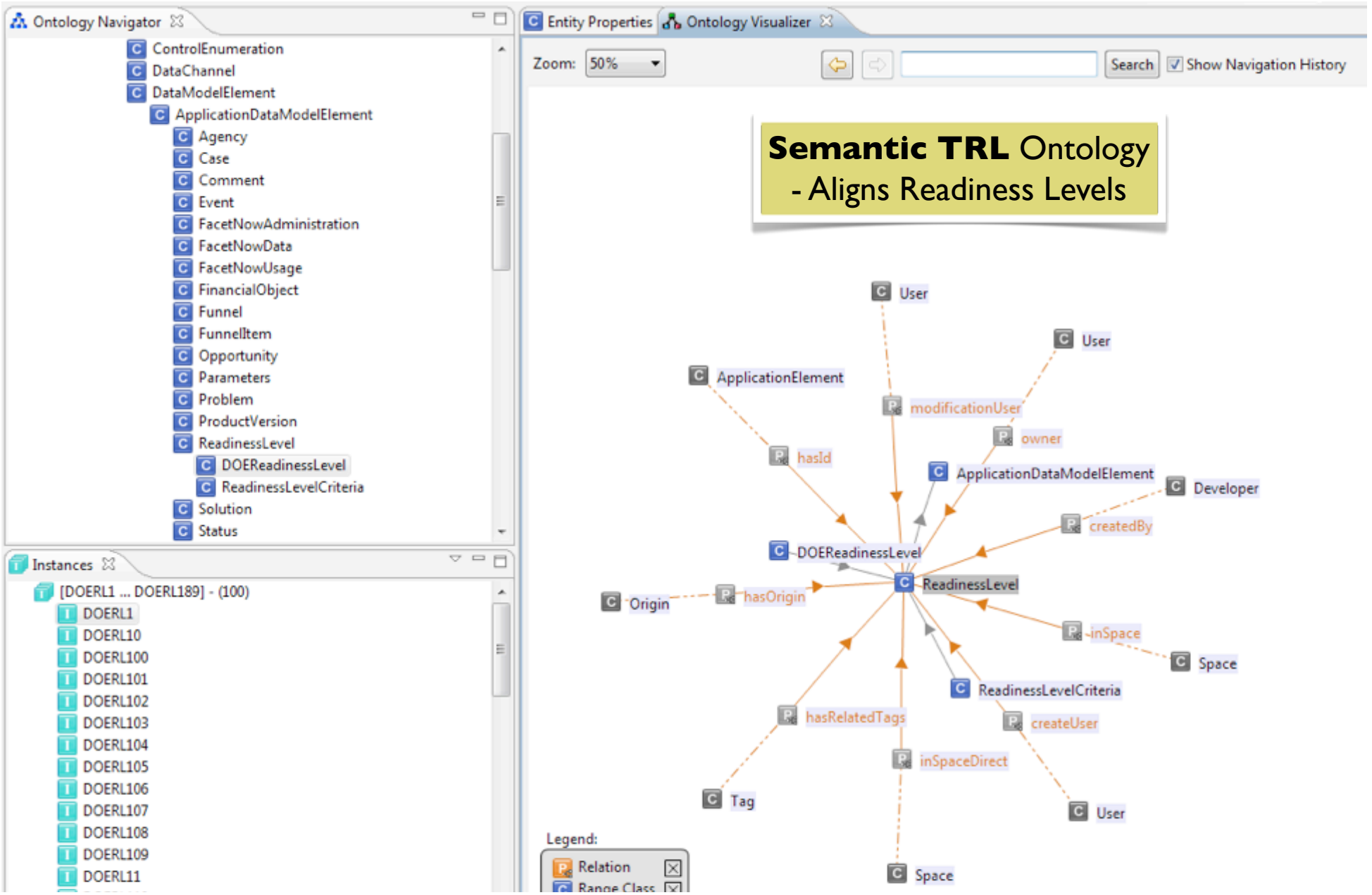
Connect Classes
Add Rules
Import Instance Data





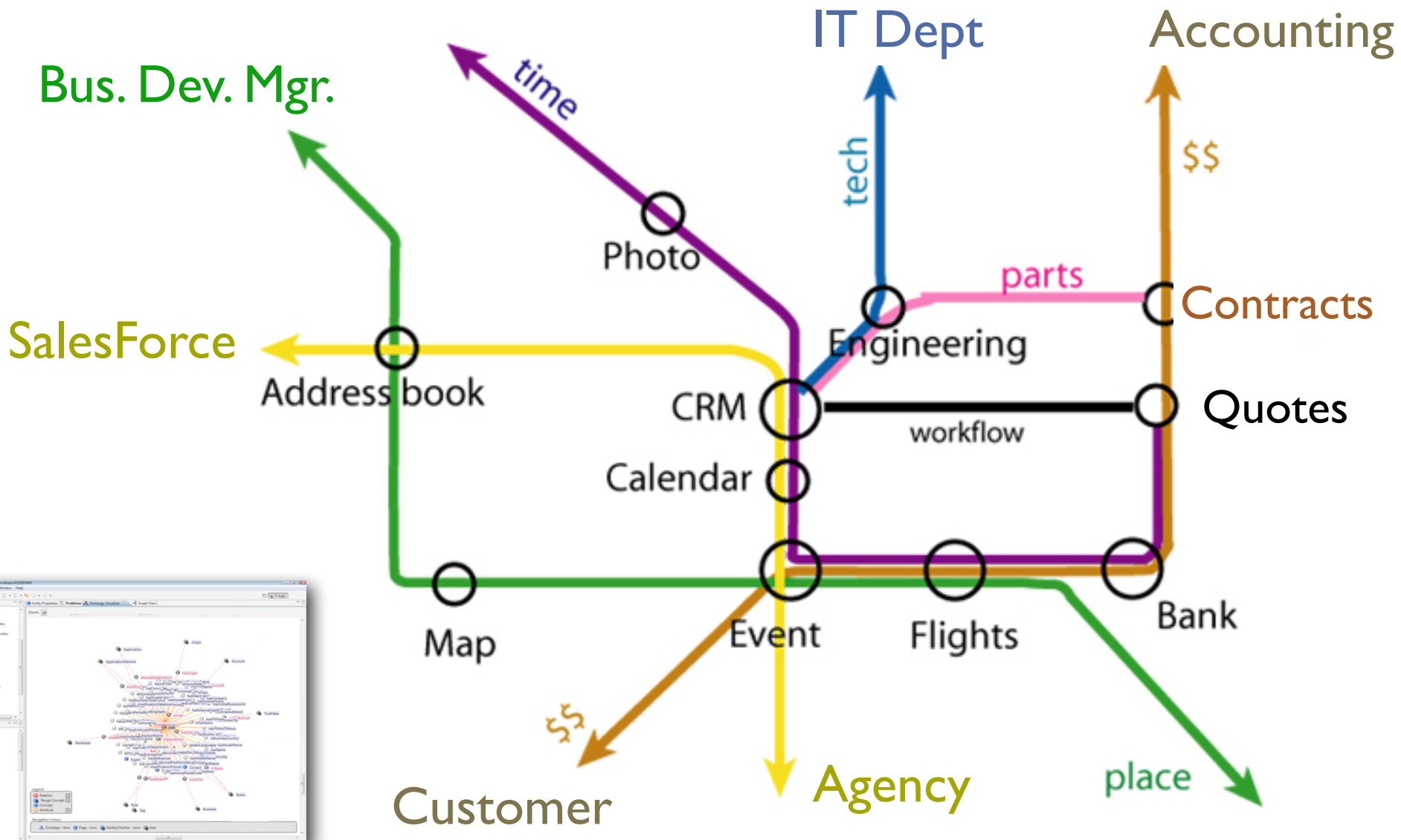


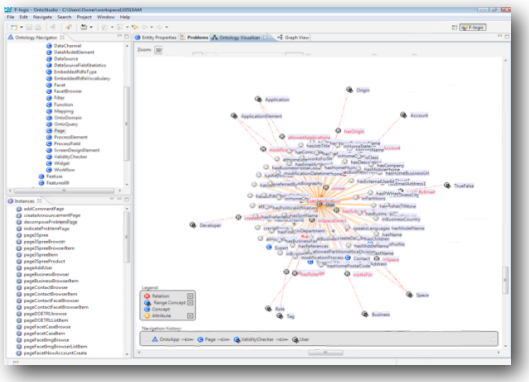
Common Knowledge Model



Connect Knowledge.

W3C Semantic Standards Enable Very High Interoperability





Interoperability Comparison Tool

Client System: Before vs. After

Interoperability vs. Approach/Effort

Easy to Build
Easy to Maintain
Low Cost

Ave. Cost

Hard to Build
Hard to Maintain
High Cost

Time
Seconds / Minutes

		Ad Hoc Custom Programming	**XML, Import/Export** Batch Processing	**XML, SOA** Live Web Services	**Semantic Web** RDF-based
Automated	8. Live Interoperability with 2-way Update	Custom code enables interop No rules or semantics. Expensive to maintain. 2	Mapping Live XML is hard. No rules or semantics. Expensive to maintain. 2	Mapping WS is very hard. No rules or semantics. Expensive to maintain. 3	Easy with shared ontology. No configuration required. Easy to maintain with rules. 5
	7. Live Interoperability with 1-way Update	Custom code enables interop No rules or semantics. Expensive to maintain. 2	Mapping Live XML is OK. No rules or semantics. Expensive to maintain. 2	Mapping WS is very hard. No rules or semantics. Expensive to maintain. 3	Easy with shared ontology. No configuration required. Easy to maintain with rules. 5
	6. Live Interoperability - read only	Custom code enables interop No rules or semantics. Expensive to maintain. 2	Mapping Live XML is OK. No rules or semantics. Expensive to maintain. 2	Mapping WS is very hard. No rules or semantics. Expensive to maintain. 3	Easy with shared ontology. No configuration required. Easy to maintain with rules. 5
Manual	5. Direct Import Export	Direct API scripting makes it slightly easier to interface. Hard to Maintain. 3	Relatively easy to interface to Direct APIs for batch processing. Hard to maintain. 3	Relatively easy to interface to direct APIs for web services. Harder to maintain. 2	Easy to interface to apps with direct import / export Easy to maintain. 5
	4. Export Import through intermediate product	Relatively easy to interface intermediary products with custom code. Hard to maintain. 3	Relatively easy to interface to intermediates for batch processing. Hard to maintain. 3	Relatively easy to interface to intermediates for web services. Harder to maintain. 2	Easy to interface to intermediate products. Easy to maintain. 5
	3. Third Party Translation	Relatively easy to interface to Translators into custom code. Hard to maintain. 3	Relatively easy to interface to Translators for batch processing. Hard to maintain. 3	Relatively easy to interface to translators for web services. Harder to maintain. 2	Easy to interface to third party apps. Easy to maintain. 5
	2. Custom Import/Export Approach	Relatively easy to write Custom code. Hard to maintain. 3	Relatively easy to write Custom code for batch processing. Hard to maintain. 3	Relatively easy to write custom code for web services. Harder to maintain. 2	Easy to interface to custom apps. Easy to maintain. 5
	1. Low: None. No interoperability enabled. Import/Export to Excel, Word, Email	Easy to import/export data to non-interoperable forms Word, Excel, eMail 5	Easy to import/export data to non-interoperable forms Word, Excel, eMail 5	Easy to import/export data to non-interoperable forms Word, Excel, eMail 5	Easy to import/export data to non-interoperable forms Word, Excel, eMail 5

Minutes / Hours

App. Examples:

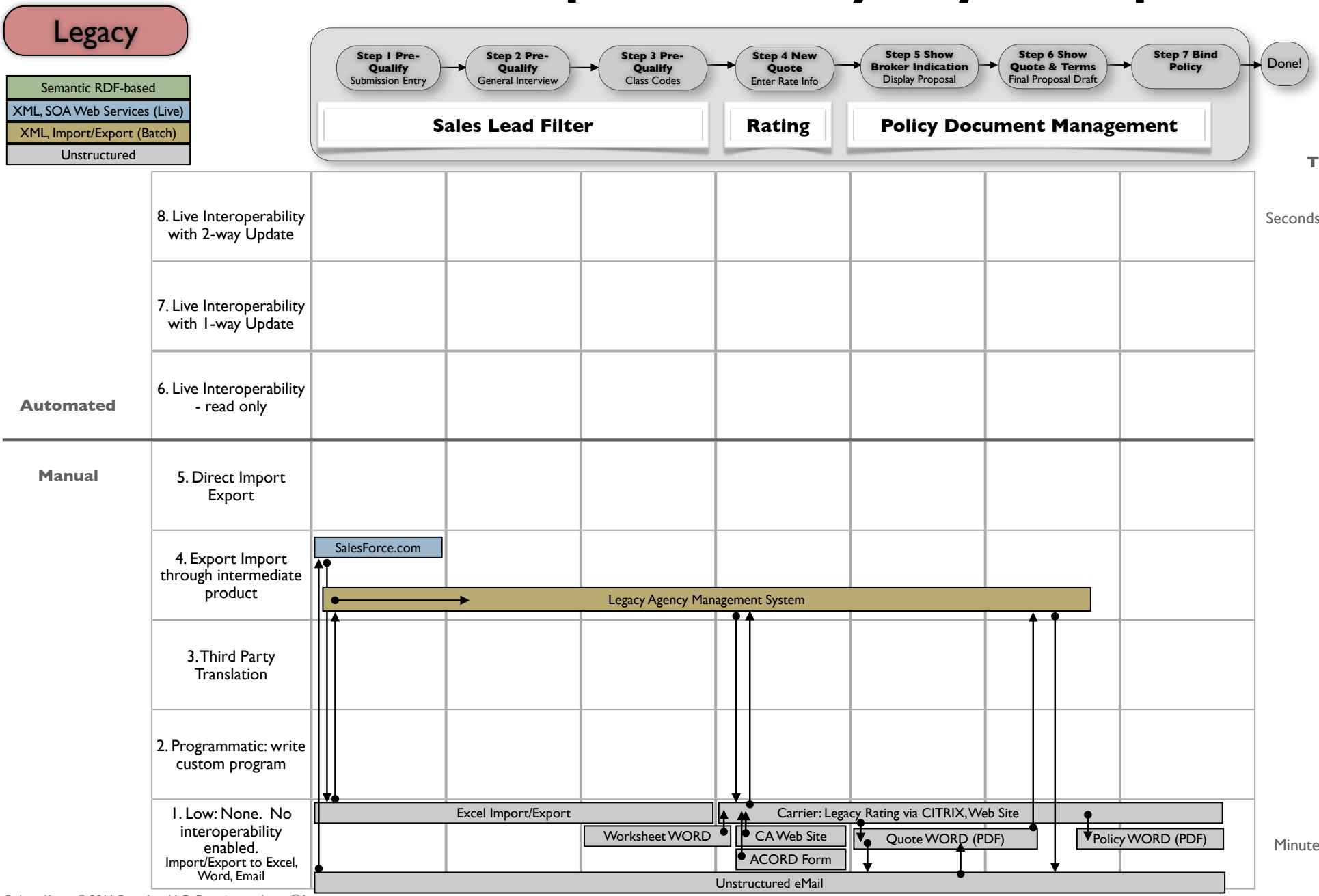
- NetRate via CITRIX
- CA CSLB Site
- ACORD Form (Fax)
- Worksheet WORD
- Unstructured eMail

- Great Plains Accounting
- Oracle DocuMaker
- Vertafore Policy Issuance (VPI)
- Vertafore ImageRight (PDF)
- USF: CGI INSideOut
- SAP Data Integrator
- Appulate Server
- ACORD Form (XML)
- Vertafore AMS 360
- Applied Sys TAM/EPIC

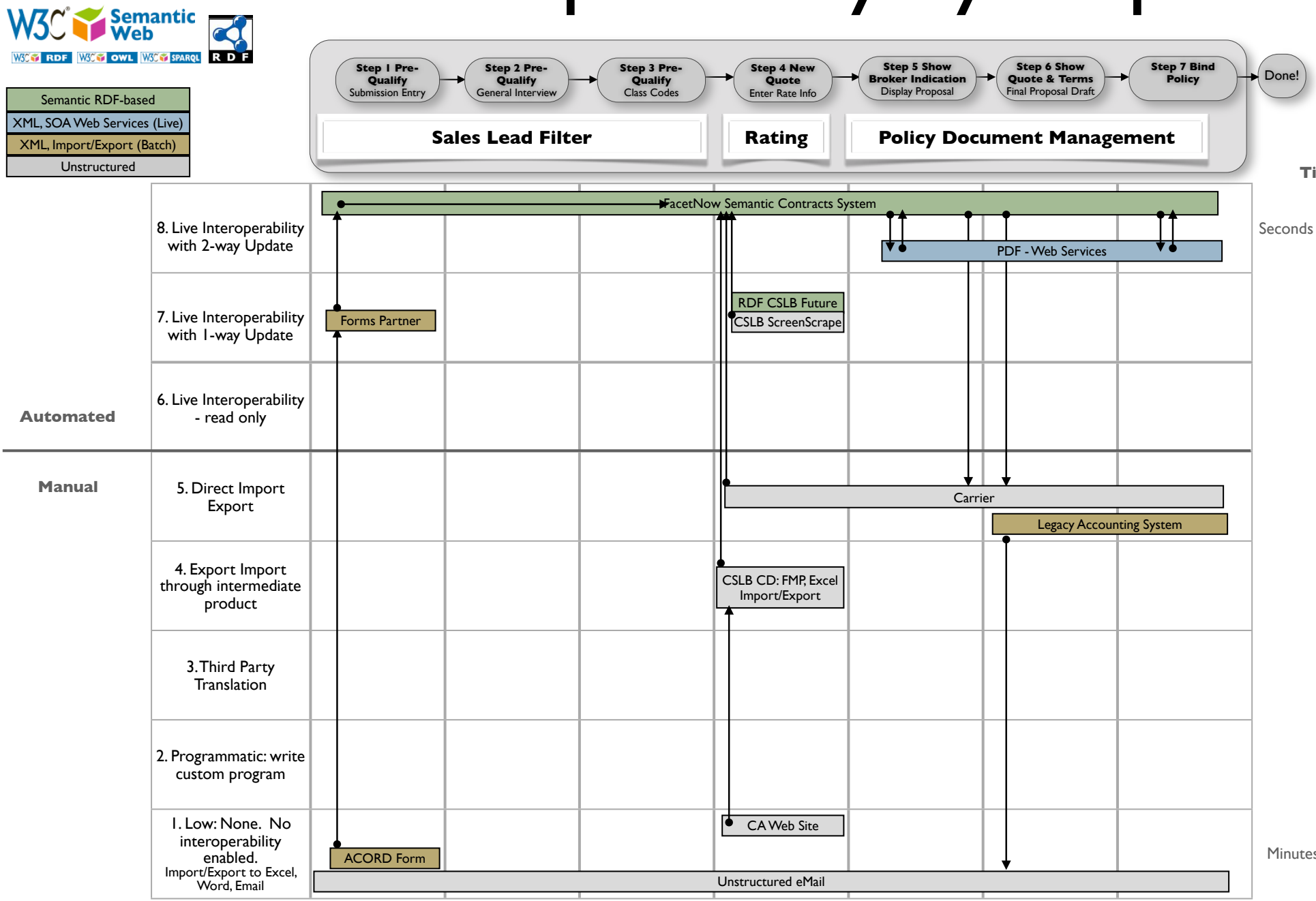
- SalesForce.com

- Semantic Platform

#1: Interoperability by Step



#1: Interoperability by Step



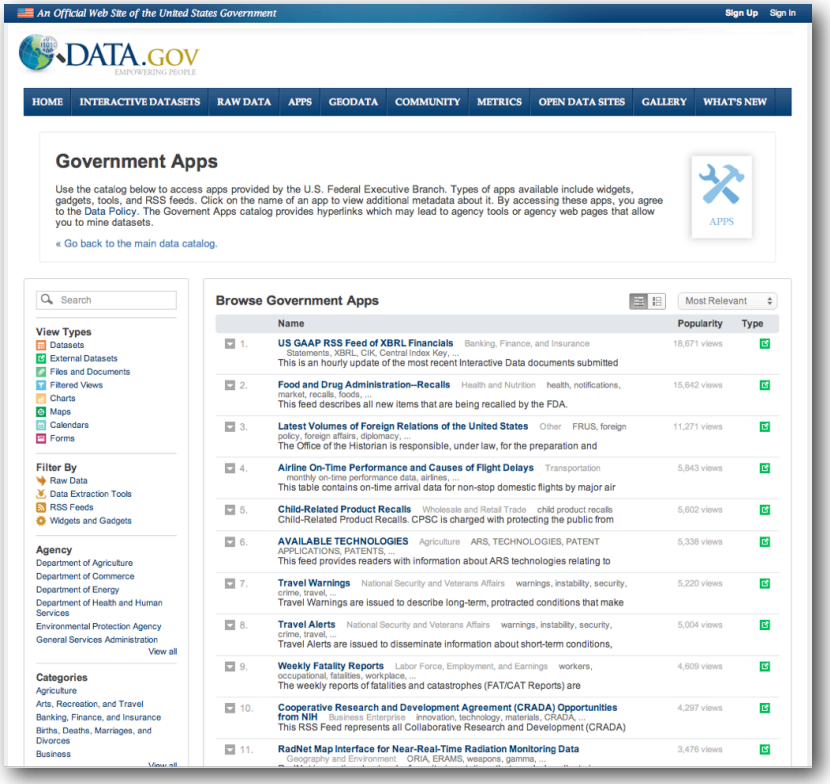
Interoperability Solutions

Join: NCOIC.org

Interoperability Rules.

Federal Data & Apps

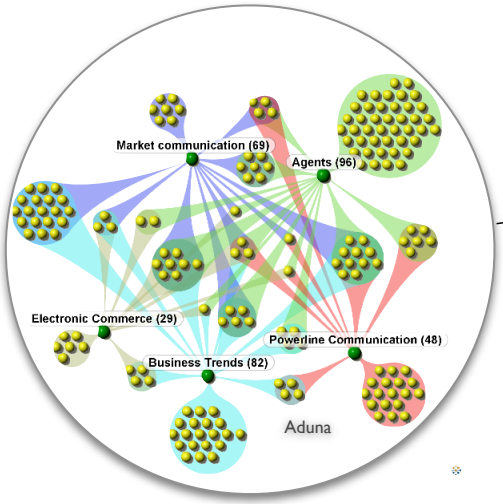
DoD, DoE, DHS

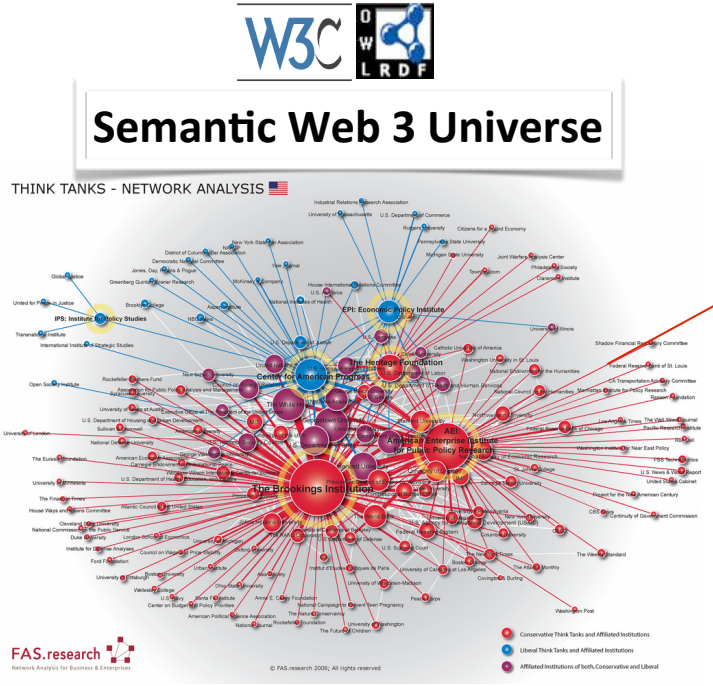


NetCentric (Semantic) Interoperability Industry Meets Govt

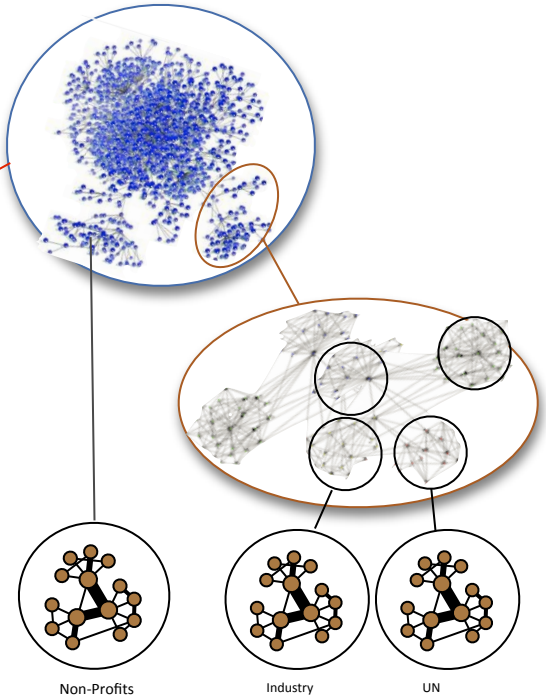
Build Your Knowledge Ecosystem

Government Communities





Your Communities



Learn More

JOIN: NCOIC™

Visit: NCOIC.org

SCOPE Working Group

Backups

What are W3C Semantic Web standards?

What Are Semantic Web Standards?

http://www.w3.org/standards/semanticweb/

A "Web of Connected Data" where computers are able to automate more intelligent decisions for you.

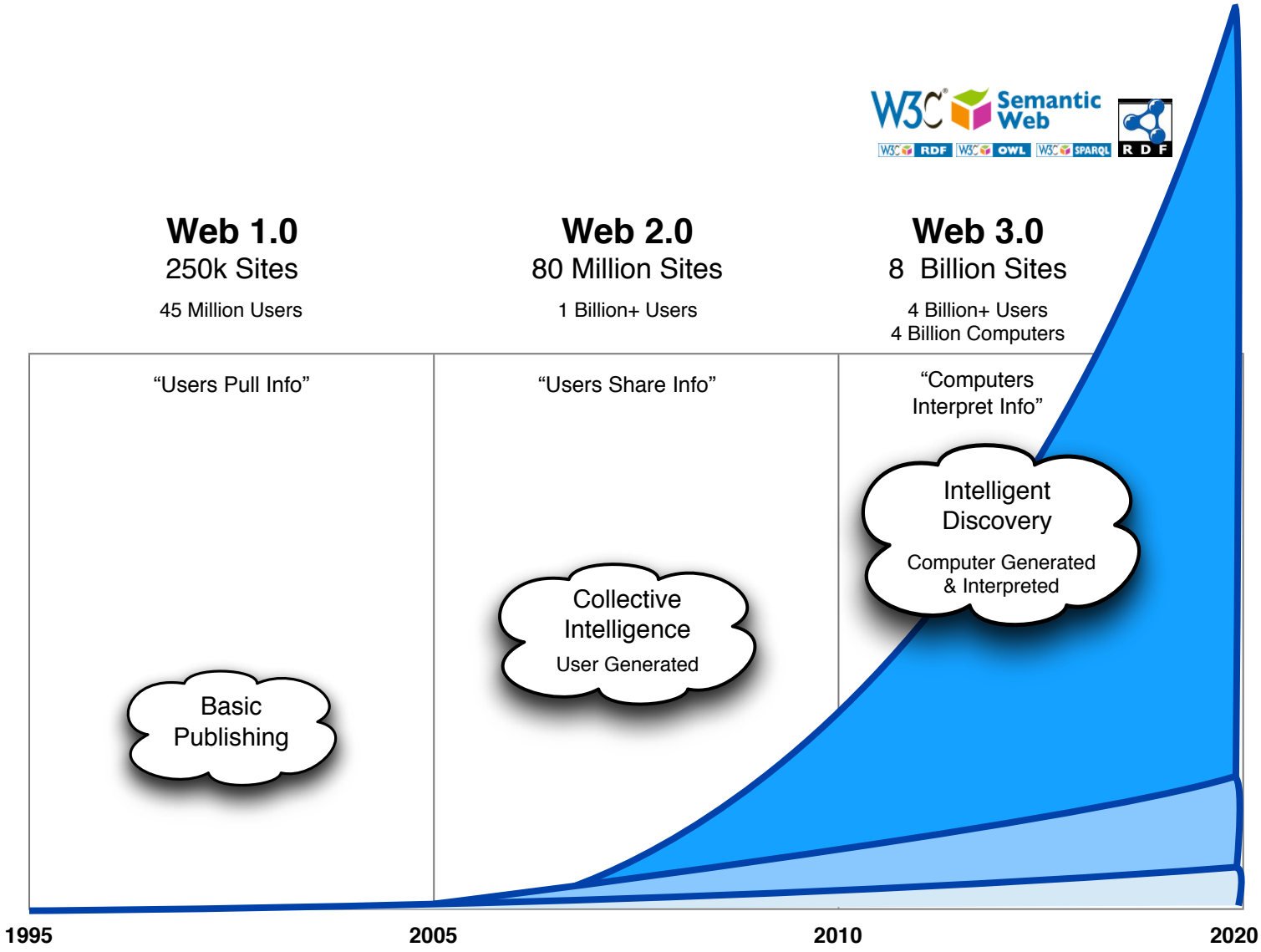
The **Semantic Web** is an evolving development of the World Wide Web in which the meaning (semantics) of information and services on the web is defined, making it possible for the web to "understand" and satisfy the requests of people and machines to use the web content.[1][2] It derives from World Wide Web Consortium director Sir Tim Berners-Lee's vision of the Web as a universal medium for data, information, and knowledge exchange.[3]

Web 2.0 vs. Semantic Web

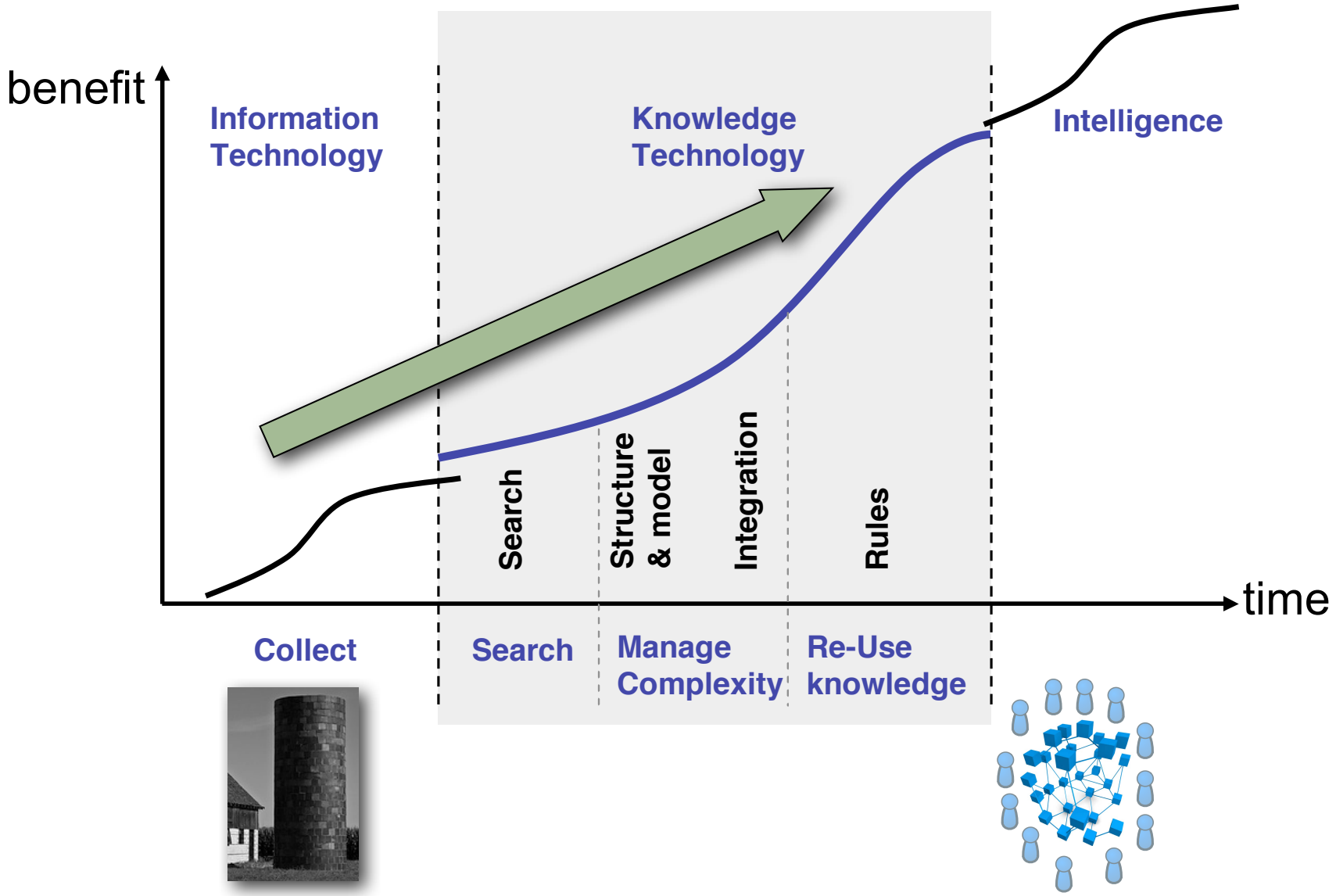
http://www.w3.org/standards/semanticweb/

	Web 2.0 technology	Semantic Web technology	Web 2.0 disadvantages	Semantic Web benefits
1	Linked Documents	Linked Data (RDF)	No Interoperability Data Silos (in a logical sense, it lacks metadata)	Real-time Mashups & data updates
2	URL	URI (RDF)	Semantically empty links	Computers Interpret Info
3	Taxonomies & Tag Clouds	Shared Vocabularies - Ontologies	Semantic confusion, Duplicate terms.	Intelligent Discovery
4	Config. Files, Macros	Rules-based Inferencing	Document dead ends	Automated Data Interpretation & presentation
5	Database Query Lang. (SQL)	Logical Query Language (SPARQL)	Text line searches give irrelevant results. Constantly dig for info	Deep Reasoning automates Info Retrieval

It's the Next Big Leap



Shift to Knowledge Models



Data is Smart

Smart Data is Cool.

High Resolution, Global Interoperability

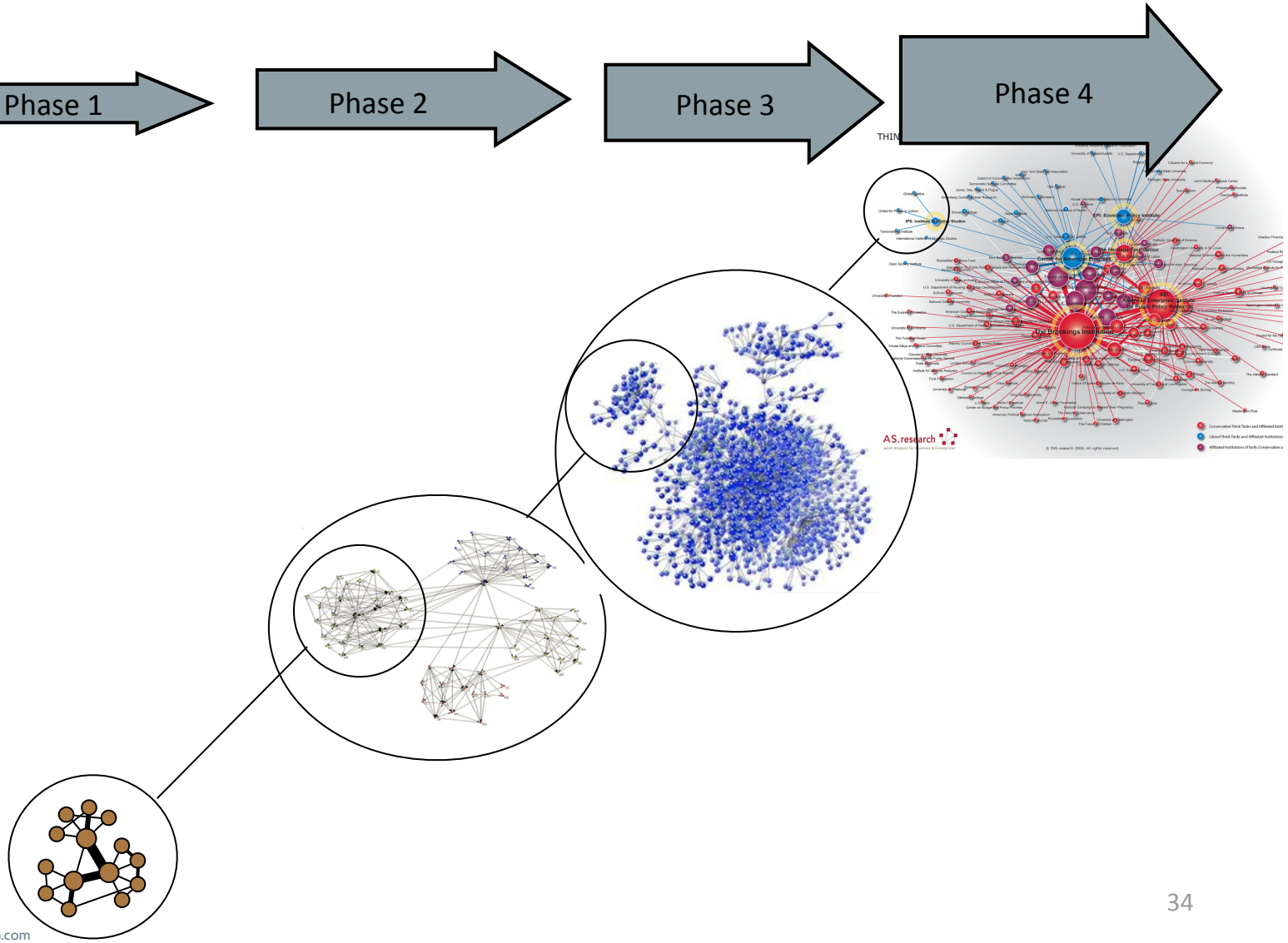
Phase 1 → Phase 2 → Phase 3 → Phase 4

Global
- GNEP
- DOE - DOD - DHS + UN, NATO

National
- DOE - DOD
- President
- Congress

Intra-Agency
- DOE <=> DOD
- Top Management

DOD
- Team Leaders



Experience Interoperability

Semantic Composite Enterprise Applications

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Abstract ID: 13616

Semantic Interoperability Levels for Comparing Use Cases

Describing Value-Add of Semantic Web Design Using a Practical Interoperability Scale

Interoperability levels are an effective means of expressing the maturity of an IT system for ease of comparing before and after implementations of a semantic web system in a legacy environment.

Prior art describes Interoperability levels in a manner that is not always practical in a setting with non-technical business users, which can quickly lose focus and impact of the intent of the tool (e.g. LISI Model). Prior art also fails to capture the relative impact of different technologies as they move data across an operational workflow.

This presentation will reveal a simple, practical method for describing the interoperability value-added when moving from a legacy environment to a semantic environment with a common workflow. The case study describes an intensive rule-based system for processing legal contracts in the insurance industry. The application could easily be applied to a wide range of eGovernment situations seeking relief from data alignment problems of legacy IT Systems: SoS, C3I, Healthcare, Technology Transition, Energy, Nuclear Waste Remediation, and more.