



THE OFFICE OF  
**ENTERPRISE ARCHITECTURE**  
OFFICE OF THE CHIEF INFORMATION OFFICER

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Data.gov:  
Semantic Web,  
Linked Data,  
and Social Media

**George Thomas, GTRA June 2010**

# This Presentation

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- From the Web of Docs to a Web of Data
- Common and Domain Specific Vocabularies
- URI Schemes
- Federation and Integration via Interlinking Vocabularies
- Social Metadata and Data
  - On Freebase
  - Using Semantic MediaWiki + Halo

# This Presentation

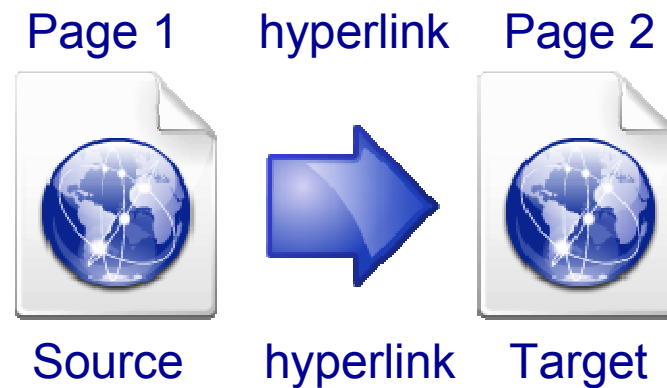
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# The Existing Web of Documents

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- Using HTML, there is only 1 *type* of link
  - An important 20<sup>th</sup> century invention for info workers!

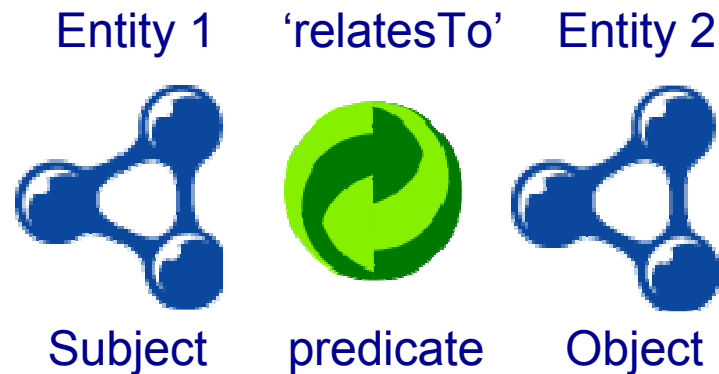


- My page contains markup that links to Your page
  - `http://myserver.tld/mypage.html`
    - `<a href='http://yourserver.tld/yourpage.html'>link text</a>`

# The Emerging Web of Data

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- Using RDF, we can create *custom* ‘tagged’ links
  - An innovation where things relate to other things



- My data resource contains **triple** markup like
  - <http://myserver.tld/Subject>
    - `<somePredicate> <http://yourserver.tld/Object>`



# Linked Data Design Principles

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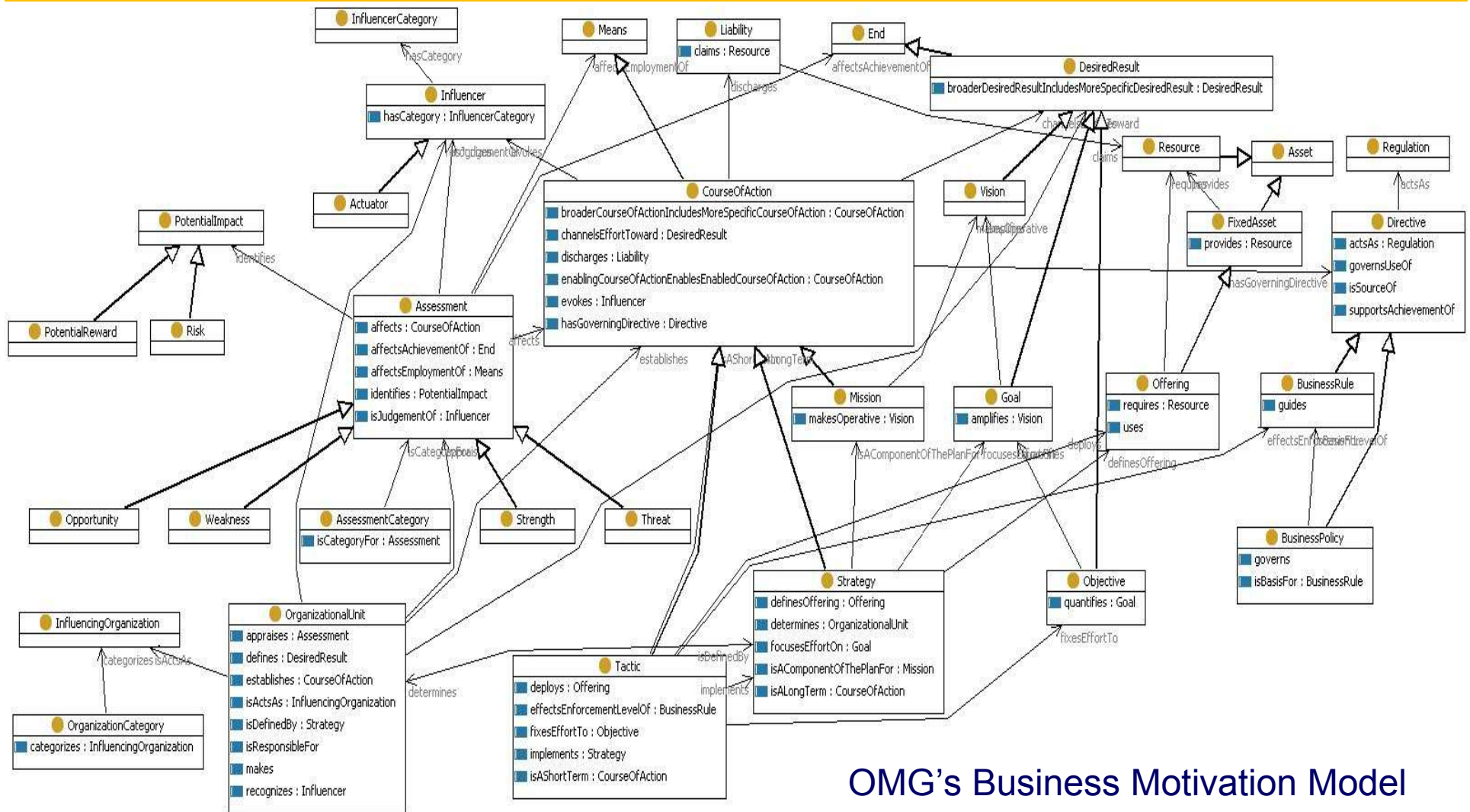
1. Use URI's as names for things  
conneg: user agent preference (HTML, RDF/XML, etc.)
2. Use HTTP URI's so that people can look up those names  
Via HTTP GET, 'dereferencing'
3. When someone looks up a URI, provide useful information, using the standards  
(RDF and SPARQL)
4. Include links to other URI's so that they can discover more things  
'traversing the data graph'

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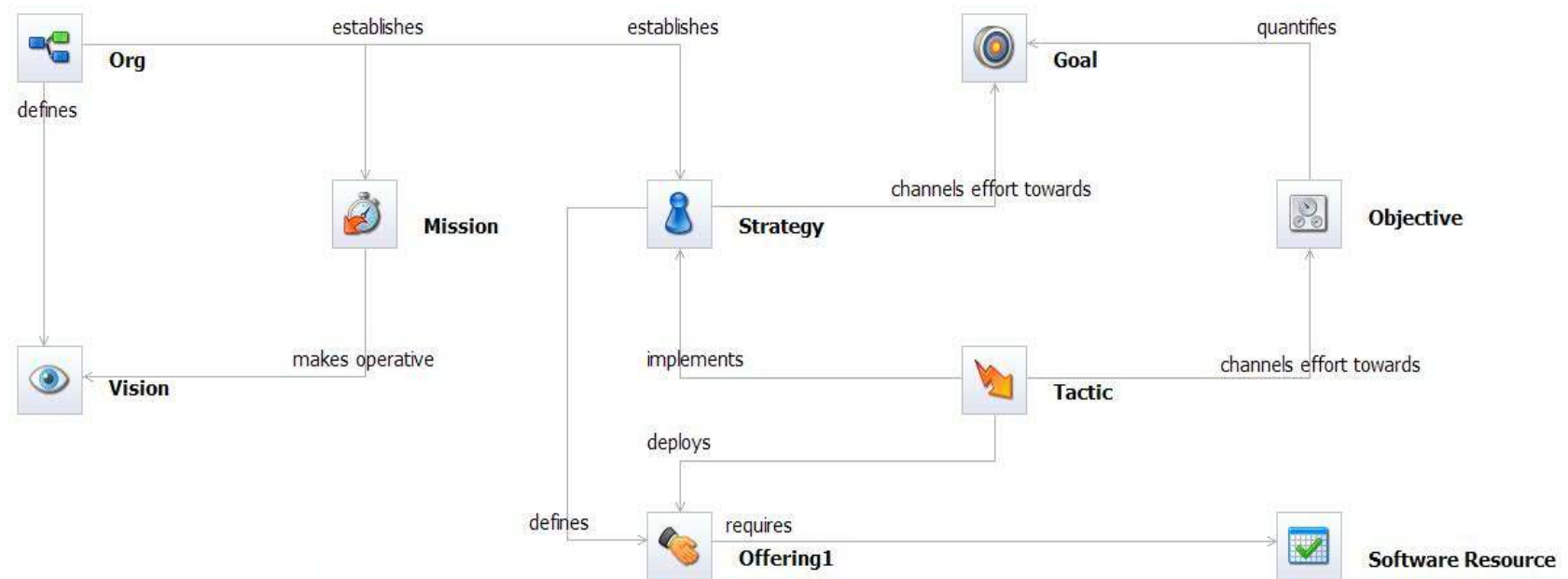
# A Management Vocabulary



OMG's Business Motivation Model

# Triples: Management Metadata

- Lets look at some BMM metadata triples



- (1-Strategy) (2-channels effort towards) (3-Goal); (2-defines) (3-Offering).
- Objective quantifies Goal.
- Tactic implements Strategy; deploys, Offering.
- Offering requires Resource.



# An IT Investment Vocabulary

	A	B	C	D	E	F	G
1	Unique Project Identifier	Agency Name	Bureau Name	Title	Description	Total IT Spending FY2008(Actuals)	Total IT Spending FY2009(Enacted)
2	009-00-01-01-01-0001-00	Department of H	Agency-wide ac	HHS	The Unified F	38.123	26.74
3	009-10-01-01-01-7068-00	Department of H	Food and Drug /	FDA	This investme	11.01	8.457
4	009-20-01-01-01-0177-00	Department of H	Centers for Dise	CDC	This investme	1.581	1.665
5	009-20-01-01-01-0292-00	Department of H	Centers for Dise	CDC	ICE fully autc	1.009	1.168
6	009-25-01-01-01-3101-00	Department of H	National Institut	NIH C	The CAS is a	0.75	0.75
7	009-25-01-01-01-4601-00	Department of H	National Institut	NIH C	The NBS rep	38.431	25.821
8	009-38-01-01-01-1020-00	Department of H	Centers for Med	CMS	HIGLAS will ;	164.152	169.23

- Creating *Triples*;
  - Get some domain specific CSV data
  - (From <http://it.usaspending.gov>)
- Worksheet name = Class name
- Worksheet Row = instance of Class
- Unique ID, Primary Key = **Subject**
- Column Name = **predicate**
- Cell data = **Object**

Exhibit300
agencyName : string
bureauName : string
cIOEvaluationComments : string
description : string
evaluationByAgencyCIO : integer
investmentPhase : string
investmentStatus : string
lastMilestoneUpdate : date
lastMonthlyUpdate : date
lineOfBusinessName : string
maintenanceSpendingFY2008Actuals : float
maintenanceSpendingFY2009Enacted : float
maintenanceSpendingFY2010Budget : float
newUpgradesSpendingFY2008Actuals : float
newUpgradesSpendingFY2009Enacted : float
newUpgradesSpendingFY2010Budget : float
no.ofRebaselinesinDashboard : integer
serviceGroupName : string
title : string
totalITSpendingFY2008Actuals : float
totalITSpendingFY2009Enacted : float
totalITSpendingFY2010Budget : float
uniqueProjectIdentifier : string

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  - On Freebase
  - Using Semantic MediaWiki + Halo

# Example URI Scheme

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- Let's take a look at the Linked Data info ecosystem on the Web

- OMB publishes a management vocabulary

```
schema.omb.gov/Objective
  <omb:quantifies> <omb:Goal>.
```

- HHS publishes data that (re)uses OMB's vocabulary

```
data.hhs.gov/MeaningfulUse
  <is a type of> <omb:Objective>;
  <omb:quantifies> <data.hhs.gov/EHR_Exchange>.
```

```
data.hhs.gov/Connect
  <omb:implements> <hhs:NHIN>;
  <omb:channelsEffortToward> <hhs:MeaningfulUse>.
```

- Data.gov aggregates Linked Open Gov Data for mashers and more linking!

```
data.gov/sparql (a query point on the Web)
  – Select Agency Objectives and IT Expenditures and ...
```

# This Presentation

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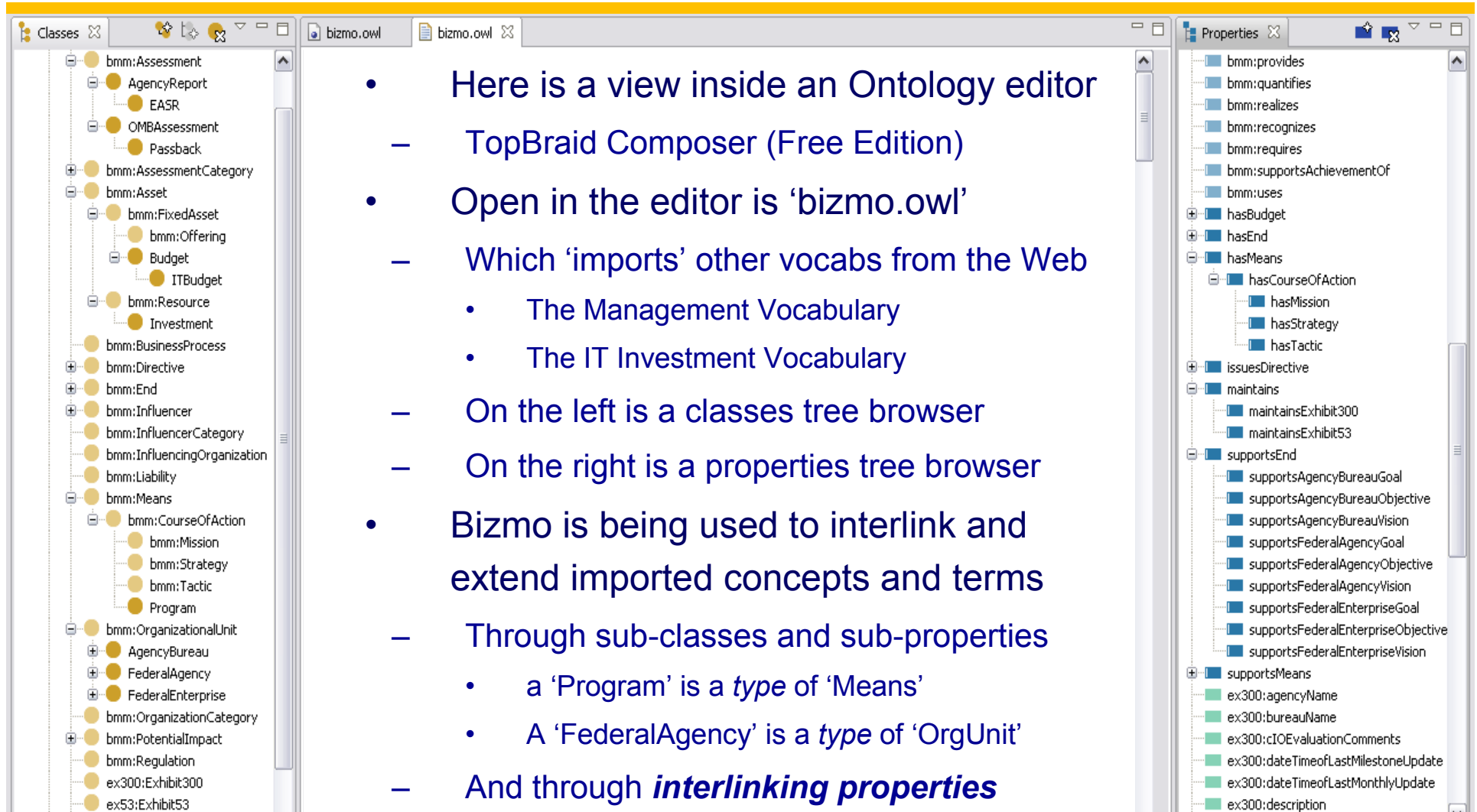
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# Federation and Integration

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- Common vocabularies come from standards orgs
  - Everyone uses these
    - Catalogs, licensing, publishing, etc.
    - Business Management, IT Investments
- Authoritative domain specific vocabularies
  - Are associated with Agency mission
    - And their Web site 'namespaces' (a base URI)
- Interlinking vocabularies connect cross agency data
  - Driven by various interested parties
    - Inside and outside of Gov
    - Adoption leads to voluntary consensus standardization
- *Integration is achieved at lower coordination cost!*

# An Interlinking Vocabulary



The screenshot displays the TopBraid Composer ontology editor interface. On the left, a 'Classes' tree browser shows a hierarchy of classes under the 'bmm' namespace, including 'Assessment', 'AgencyReport', 'EASR', 'OMBAssessment', 'Passback', 'Assessment:Category', 'Asset', 'FixedAsset', 'Offering', 'Budget', 'ITBudget', 'Resource', 'Investment', 'BusinessProcess', 'Directive', 'End', 'Influencer', 'Influencer:Category', 'InfluencingOrganization', 'Liability', 'Means', 'CourseOfAction', 'Mission', 'Strategy', 'Tactic', 'Program', 'OrganizationalUnit', 'AgencyBureau', 'FederalAgency', 'FederalEnterprise', 'Organization:Category', 'PotentialImpact', 'Regulation', 'ex300:Exhibit300', and 'ex53:Exhibit53'. The central workspace shows two open files named 'bizmo.owl'. On the right, a 'Properties' tree browser lists various properties such as 'provides', 'quantifies', 'realizes', 'recognizes', 'requires', 'supportsAchievementOf', 'uses', 'hasBudget', 'hasEnd', 'hasMeans', 'hasCourseOfAction', 'hasMission', 'hasStrategy', 'hasTactic', 'issuesDirective', 'maintains', 'maintainsExhibit300', 'maintainsExhibit53', 'supportsEnd', 'supportsAgencyBureauGoal', 'supportsAgencyBureauObjective', 'supportsAgencyBureauVision', 'supportsFederalAgencyGoal', 'supportsFederalAgencyObjective', 'supportsFederalAgencyVision', 'supportsFederalEnterpriseGoal', 'supportsFederalEnterpriseObjective', 'supportsFederalEnterpriseVision', 'supportsMeans', 'ex300:agencyName', 'ex300:bureauName', 'ex300:cIOEvaluationComments', 'ex300:dateTimeofLastMilestoneUpdate', 'ex300:dateTimeofLastMonthlyUpdate', and 'ex300:description'.

- Here is a view inside an Ontology editor
  - TopBraid Composer (Free Edition)
- Open in the editor is 'bizmo.owl'
  - Which 'imports' other vocabs from the Web
    - The Management Vocabulary
    - The IT Investment Vocabulary
  - On the left is a classes tree browser
  - On the right is a properties tree browser
- Bizmo is being used to interlink and extend imported concepts and terms
  - Through sub-classes and sub-properties
    - a 'Program' is a *type* of 'Means'
    - A 'FederalAgency' is a *type* of 'OrgUnit'
  - And through ***interlinking properties***

# Autonomous Owners of Integrated Metadata



- Combine classes and properties from multiple publisher namespaces

# Close Up: Interlinking Properties

- ***supportsABC*** properties link IT investments
  - To Management goals and objectives, etc.
    - Extending metadata specs, without changing them!



- ***maintainsXYZ*** properties link an Organizational Unit
  - To IT investment information



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# Social Metadata on Freebase

Goal - Freebase

www.freebase.com/type/schema/base/bizmo/goal

Freebase Search 11 million interconnected topics

Explore Apps Developers Help

Signed in as georgethomas Settings Sign out

draft bizmo

## Goal rename | delete

Also known as: [Add other possible names for this type](#) edit

There is no description for this type.  
[Edit Description](#)

Display: **Standard** edit

Suggested properties there are no suggestions yet. [Got an idea?](#)

**Goal Properties** Type Key: goal edit [Add new](#) 3 incoming [Reorder](#)

Property Name	Data Type	Property Description
<a href="#">edit</a> Amplifies amplifies	<a href="#">Vision</a>	goal amplifies vision

Type made by georgethomas for the bizmo Base

[Type History >](#)

**Goal Topics**

- Health Care Reform

[View All >](#)

**Related Types**

**bizmo Types**

- A Type specification HTML page, defining a vocabulary term (Goal)
  - And can see the properties that link (relate) this Type to other Types
- Members of this 'base' get notified that George created/edited this Type
  - And see instances of this Type (called Topics on Freebase)

# Social Metadata History on Freebase

The screenshot shows the Freebase website interface. The browser address bar displays `www.freebase.com/history/view/base/bizmo/goal`. The page title is "History for Goal". The main content area shows a list of activities for the "Goal" type, filtered by the user "georgethomas". The activities are as follows:

Timestamp	Activity	Details	User
7:08:25PM UTC	Relationship added	expected_by Supports Federal Goal expected_type Goal (bizmo Base)	/user/georgethomas
2:13:09PM UTC	added type: Goal (bizmo Base)	Health Care Reform	/user/georgethomas
1:57:05PM UTC	Relationship added	expected_by Federal Enterprise Goal expected_type Goal (bizmo Base)	/user/georgethomas

On the right side, there is a "Filter this page by:" sidebar with the following options:

- Date:** Range from Jul 3, 2009 to May 23, 2010.
- User:** georgethomas
- Submit** button.

- The activity-stream for this Type (Goal)
  - The 'base' that these belong to can also be looked at this way
- Contributions filtered by User and Date range
  - Individual User contributions can also be examined across any/all Types

# Social Data on Freebase

Health Care Reform facts - ...

www.freebase.com/view/m/06635kx/-/base/bizmo

Freebase Search 11 million interconnected topics Explore Apps Developers Help

Signed in as **georgethomas**  
Settings Sign out

## Health Care Reform

These people have edited this topic:

**Edit this topic**

Last edited Mar 5, 2010 See all topic history >

**Edit and Show details**  
Add or delete facts, download data in JSON or RDF formats, and explore topic metadata.

**Freebase**  
What is Freebase?

**Flag this Topic**  
Why do you want to flag this topic?

- A Type instance (Topic) HTML page, defining a specific Goal
  - ‘Health Care Reform’
- Data about this topic/instance can be retrieved as JSON or RDF (N-triple)
  - And it’s revision history and member contributions can be viewed

Page History **RDF** Feedback Attribution Policy Terms of Service About Us Jobs Freebase Blog

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# Social Data History on Freebase

The screenshot shows the Freebase website interface. At the top, there is a navigation bar with the Freebase logo, a search bar containing "Search 11 million interconnected topics", and links for "Explore", "Apps", "Developers", and "Help". The user is signed in as "georgethomas". The main content area is titled "History for Health Care Reform". It displays a list of activities for the date "Jul 5, 2009". Each activity includes a timestamp, the type of relationship added, the topic ID, and the user's profile picture and name. A filter sidebar on the right allows filtering by "Date" (with a range from Jul 5, 2009 to May 23, 2010) and "User" (with "georgethomas" selected). A "Submit" button is located at the bottom of the filter sidebar.

Timestamp	Activity	Topic ID	User
7:12:13PM UTC	Relationship added	/m/0663f5x Supports Federal Goal Health Care Reform	/user/georgethomas
2:13:09PM UTC	Relationship added	/m/06635kd Federal Enterprise Goal Health Care Reform	/user/georgethomas
2:13:09PM UTC	added type: Desired Result (bizmo Base)		/user/georgethomas
2:13:09PM UTC	added type: End (bizmo Base)		/user/georgethomas

- The activity-stream for this 'Topic' (Health Care Reform)
  - You can see when and by whom relationships with this data resource was created
- Contributions filtered by User and Date range
  - Individual User contributions can also be examined across any/all 'Topics' (resources)

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# Browsing SMW KB via Classes

Expand view | George.thomas | Log out

**THE OFFICE OF ENTERPRISE ARCHITECTURE**  
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Search this wiki

Home | **Vocabs** | Tools | Data | Demos | Administration ▾

OntologyBrowser Browse > Exhibit300 > 009-00-01-01-01-0001-00 > Browse > OntologyBrowser >

**Special** More

The ontology browser lets you navigate through the ontology to easily find and identify items in the wiki. Use the Filter Mechanism at the upper left to search for specific entities in the ontology and the filters below each column to narrow down the given results. Initially the flow of browsing is left to right. You can flip the flow by clicking the big arrows between the columns. Press Ctrl+Alt+Space to use auto-completion. (Ctrl+Space in IE)

**Category Tree**  **Property Tree**

- Assessment (open)
  - AssessmentCategory (open)
- Asset (open)
  - BusinessProcess (open)
- Directive (open)
- End (open)
- Ex300 (open)
- Ex53 (open)
- Exhibit300 (open)
- Exhibit53 (open)
- GardeningLog (open)
- Influencer (open)
  - InfluencerCategory (open)
  - InfluencingOrganization (open)
- KSA (open)
- Liability (open)
- Means (open)
  - OrganizationCategory (open)
  - OrganizationalUnit (open)
- PotentialImpact (open)
- Regulation (open)
- VCS (open)
- VCSO (open)

Filter

**Instances**

Acquisition2.0	(open)	<Strategy>
CCAC	(open)	<Mission>
Connect	(open)	<Tactic>
COSS	(open)	<Tactic>
GovBestPractice	(open)	<Tactic>
HCR	(open)	<Mission>
IndustryBenchmark	(open)	<Tactic>
LBD	(open)	<Mission>
LearningOrganization	(open)	<Strategy>
LOD	(open)	<Tactic>
NHIN	(open)	<Strategy>
ONC	(open)	<Mission>
SDW	(open)	<Strategy>
SNS	(open)	<Tactic>

Filter

**Properties**  no inferred

	Values
ChannelsEffortTowa... (open)	PBC
DefinesOffering (open)	Data.hhs.gov
IsAComponentOfTheP... (open)	HCR

Filter

# Browsing SMW KB via Properties

The screenshot displays the 'Special' page of an ontology browser. At the top, there is a search bar with the text 'Search this wiki' and 'GO Search' buttons. Below the search bar is a navigation menu with 'Vocabs', 'Tools', 'Data', 'Demos', and 'Administration'. The breadcrumb trail reads: 'OntologyBrowser > Browse > Exhibit300 > 009-00-01-01-01-0001-00 > Browse > OntologyBrowser >'. The main content area is titled 'Special' and contains a paragraph explaining the ontology browser's navigation capabilities. Below the text are buttons for 'Filter Browsing', 'Reset', and 'Hide Instances'. The interface is divided into three main panels: 'Category Tree', 'Instances', and 'Properties'. The 'Category Tree' panel on the left lists various properties, with 'DefinesOffering' selected. The 'Instances' panel in the middle shows 'LearningOrganization' and 'SDW'. The 'Properties' panel on the right shows a table of values for 'DefinesOffering'.

Special More

The ontology browser lets you navigate through the ontology to easily find and identify items in the wiki. Use the Filter Mechanism at the upper left to search for specific entities in the ontology and the filters below each column to narrow down the given results. Initially the flow of browsing is left to right. You can flip the flow by clicking the big arrows between the columns. Press **Ctrl+Alt+Space** to use auto-completion. (Ctrl+Space in IE)

Category Tree  Property Tree

- BroaderDesiredResultIncludesMoreSpecificDesiredResult (open)
- BureauName (open)
- CIOEvaluationComments (open)
- Categorizes (open)
- ChannelsEffortToward (open)
- Claims (open)
- Creates (open)
- DateTimeofLastMilestoneUpdate (open)
- DateTimeofLastMonthlyUpdate (open)
- Defines (open)
- DefinesOffering (open)
- Delivers (open)
- DefinesOffering
- Deploys (open)
- Description (open)
- Determines (open)
- Discharges (open)
- EffectsEnforcementLevelOf (open)
- EnablingCourseOfActionEnablesEnabledCourseOfAction (open)
- Establishes (open)
- EvaluationByAgencyCIO (open)
- Evokes (open)

Filter

Instances

- LearningOrganization (open)
- SDW (open)

Filter

Properties  no inferred

Properties	Values
ChannelsEffortTowa... (open)	PBC
DefinesOffering (open)	Data.hhs.gov
IsAComponentOfTheP... (open)	HCR

Filter


# Ontology Classes/Properties = Tags

The screenshot shows a wiki editing interface for 'Acquisition2.0'. The page title is 'Acquisition2.0' and the content area contains the text 'OrganizationalUnit'. A sidebar on the right contains several sections: 'Links to Other Pages', 'Tools', 'Categories', 'Properties', 'Ontology Browser', 'Help', and 'Annotation hints'. The 'Categories' section is active, showing a search box with the letter 'F' and a dropdown menu with suggestions: 'FederalAgency', 'FederalEnterprise', and 'FixedAsset'. The 'Properties' section shows a table with the property 'Establishes' and the value 'Acquisition2.0'. The 'Ontology Browser' section has a search box labeled 'Mark a word...'. The 'Help' section contains the text 'No relevant help questions have been added to the system yet.' and a '(more)' link. The 'Annotation hints' section is empty.

- Create **semantic annotations** (part of wysiwyg editor tools)
  - **auto-completion** suggests tags to reuse from ontologies that have been imported into the wiki (note existing tags from BMM ontology)

# Ontology based SMW KB Query

Expand view | George.thomas | Log out

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Search this wiki

[Home](#) [Vocabs](#) [Tools](#) [Data](#) [Demos](#) [Administration](#)

Query Interface UHC > OntologyBrowser > QueryInterface > Ask > QueryInterface >

Special More

**Query Tree Navigation**

[Main Query](#)

- [-] Main Query
  - [-] Categories:
    - [-] Exhibit300
  - [-] bureauName
    - [-] String = Centers for Disease Control and Prevention
    - [-] or = Centers for Medicare and Medicaid Services
    - [-] or = National Institutes of Health
  - [-] title
    - [-] Page = \*
  - [-] newUpgradesSpendingFY2010Budget
    - [-] Number = \*

Property name:

Show in results:

Value must be set:

String =

or =

[Add](#) [Cancel](#) [Delete](#)

**Table Column Preview**

Article title	bureauName	title	newUpgradesSpendingFY2010Budget	totalITSpendingFY2010Budget	evaluationByAgencyCIO
---------------	------------	-------	---------------------------------	-----------------------------	-----------------------


**Result Preview**

	BureauName	Title	NewUpgradesSpendingFY2010Budget	TotalITSpendingFY2010Budget	EvaluationByAgencyCIO
009-20-01-01-01-0177-00	Centers for Disease Control and Prevention	CDC Health Impact Planning (HI.Net/IRIS)	0.397	1.617	4
009-20-01-01-01-0292-00	Centers for Disease Control and Prevention	CDC Integrated Contracts Expert (ICE)	0	1.257	4
009-20-01-03-01-0278-00	Centers for Disease Control and Prevention	CDC CCID Vaccine Tracking System (VTrckS)	14.771	14.771	4

**Query Layout Manager**

# SMW KB Report Generation

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[Home](#)
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[Tools](#)
[Data](#)
[Demos](#)
[Administration](#) ▼

HCR > UHC > OntologyBrowser > QueryInterface > Ask >

**Special** More

**Query**

```
[[Category:Exhibit300]]
[[bureauName::+]]
[[bureauName::Centers for Disease Control and Prevention|Centers for Medicare and Medicaid Services|National Institutes of Health]]
```

[Add sorting condition]

Format as: broadtable (default)

- Find results
- aggregation
- Category
- CSV export
- Embed page contents
- Enumeration
- exceltable
- Itemization
- JSON export
- List
- RSS export
- table
- Template

**Additional printouts (optional)**

```
?BureauName
?Title
?EvaluationByAgencyCIO
?TotalITSpendingFY2010Budget
?NewUpgradesSpendingFY2010Budget
```

Previous **Results 1–20** Next (20 | 50 | 100 | 250 | 500)

	Title	EvaluationByAgencyCIO	TotalITSpendingFY2010Budget	NewUpgradesSpendingFY2010Budget
009-38-01-01-1020-00	Centers for Medicare and Medicaid Services and National Institutes of Health CMS Healthcare Integrated General Ledger Accounting System (HIGLAS)	4	167.715	35.681
009-38-01-01-1050-00	Centers for Medicare and Medicaid Services and National Institutes of Health CMS Modernized IT Infrastructure (EDCs)	5	120.86	0
009-38-01-01-1090-00	Centers for Medicare and Medicaid Services CMS Beneficiary Enrollment and Plan Payment for Part C & D	5	62.477	0
009-25-04-00-01-1326-00	National Institutes of Health NIH OD Electronic Research Administration (eRA)	3	40.246	19.971
009-20-01-03-01-1163-00	Centers for Disease Control and Prevention CDC PHIN: BioSense	5	36.7	31.3
009-25-01-01-01-4601-00	National Institutes of Health NIH OD NIH Business System (NBS)	4	26.397	5.3
009-38-01-02-	Centers for Medicare and Medicaid Services CMS Health Care Quality Improvement System	4	19.127	0

# NHIN – Automagic Data Merging

Special More

009-90-03-00-01-0002-00

AgencyName	Department of Health and Human Services + 🔍
BureauName	Departmental Management + 🔍
DateTimeofLastMilestoneUpdate	11/24/2009 + 🔍
DateTimeofLastMonthlyUpdate	11/24/2009 + 🔍
Description	Collaborative Government and industry program to develop prototypes for and evaluate a NHIN in live interoperable environments for consumer centric health care delivery adverse drug reporting emergency response and bioterrorism. + 🔍
EvaluationByAgencyCIO	3 + 🔍
InvestmentPhase	Full-Acquisition + 🔍
InvestmentStatus	Current + 🔍
LastMilestoneUpdate	11/24/2009 + 🔍
LastMonthlyUpdate	11/24/2009 + 🔍
LineOfBusinessName	Health + 🔍
MaintenanceSpendingFY2008Actuals	0 + 🔍
MaintenanceSpendingFY2009Enacted	0 + 🔍
MaintenanceSpendingFY2010Budget	0 + 🔍
MajorInvestment	Yes + 🔍
Modification date	1 January 2010 22:16:09 + 🔍
NewUpgradesSpendingFY2008Actuals	19.889 + 🔍
NewUpgradesSpendingFY2009Enacted	19.127 + 🔍
NewUpgradesSpendingFY2010Budget	19.309 + 🔍
No.ofRebaselinesinDashboard	2 + 🔍
ServiceGroupName	Services for Citizens + 🔍
SupportsFederalAgencyGoal	HIE-EHR-HIE + 📄, Agency Specific + 📄
SupportsFederalAgencyMission	ONC + 📄, HCR + 📄
SupportsFederalAgencyObjective	Meaningful Use + 📄
SupportsFederalAgencyStrategy	NHIN + 📄
SupportsFederalAgencyTactic	COSS + 📄, Connect + 📄
SupportsFederalAgencyVision	UHC + 📄
SupportsFederalEnterpriseVision	UHC + 📄
Title	OS ONC Nationwide Health Information Network (NHIN) + 🔍
TotalITSpendingFY2008Actuals	19.889 + 🔍
TotalITSpendingFY2009Enacted	19.127 + 🔍
TotalITSpendingFY2010Budget	19.309 + 🔍
Categories	Ex300, Ex53, Exhibit300, Exhibit53

hide properties that link here

HHS + 📄 MaintainsExhibit300  
HHS + 📄 MaintainsExhibit53

This UPI keyed data is captured from Ex300/53 submissions...

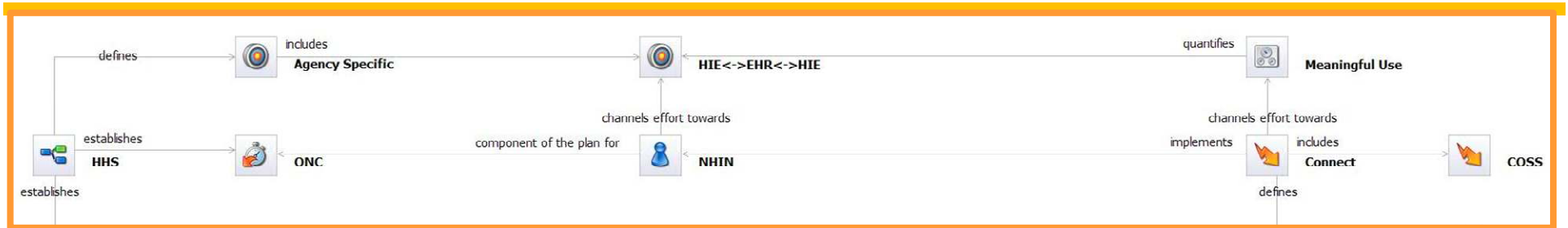
But this data is 'merged' from other independently published sources on the Web of Data!!

# NHIN RDF/XML IEP: Export Excerpt

```
<?xml version="1.0" encoding="UTF-8" ?> [...]
<rdf:RDF [...]
  xmlns:ex300="http://ontologies.socialdataweb.org/fedsheets/omb/ex300/ex300.owl#"
  xmlns:ex53="http://ontologies.socialdataweb.org/fedsheets/omb/ex53/ex53.owl#"
  xmlns:bizmo="http://ontologies.socialdataweb.org/bizmo/bizmo.owl#" [...]
  <swivt:Subject
    rdf:about="http://localhost/sdw/index.php/Special:URIResolver/009-2D90-2D03-2D00-2D01-2D0002-2D00" >
    <rdfs:label>009-90-03-00-01-0002-00</rdfs:label> [...]
    <rdf:type rdf:resource="http://ontologies.socialdataweb.org/fedsheets/omb/ex300/ex300.owl#Exhibit300"/>
    <rdf:type rdf:resource="http://ontologies.socialdataweb.org/fedsheets/omb/ex53/ex53.owl#Exhibit53"/> [...]
    <ex53:majorInvestment rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Yes</ex53:majorInvestment> [...]
    <bizmo:supportsFederalAgencyGoal rdf:resource="http://localhost/sdw/index.php/Special:URIResolver/HIE-2DEHR-2DHIE"/> [...]
    <ex300:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">OS ONC Nationwide Health Information Network (NHIN)</ex300:title> [...]
  </swivt:Subject> [...]
  <swivt:Subject rdf:about="http://localhost/sdw/index.php/Special:URIResolver/HHS">
    <rdfs:label>HHS</rdfs:label>
    <swivt:page rdf:resource="http://localhost:8080/sdw/index.php/HHS"/>
    <rdfs:isDefinedBy rdf:resource="http://localhost:8080/sdw/index.php/Special:ExportRDF/HHS"/>
    <bizmo:maintainsExhibit300 rdf:resource="http://localhost/sdw/index.php/Special:URIResolver/009-2D90-2D03-2D00-2D01-2D0002-2D00"/>
    <bizmo:maintainsExhibit53 rdf:resource="http://localhost/sdw/index.php/Special:URIResolver/009-2D90-2D03-2D00-2D01-2D0002-2D00"/>
  </swivt:Subject> [...]
  <owl:ObjectProperty rdf:about="http://ontologies.socialdataweb.org/bizmo/bizmo.owl#maintainsExhibit300"> [...] </owl:ObjectProperty> [...]
  <owl:DatatypeProperty rdf:about="http://ontologies.socialdataweb.org/fedsheets/omb/ex300/ex300.owl#title"> [...] </owl:DatatypeProperty> [...]
  <owl:ObjectProperty rdf:about="http://ontologies.socialdataweb.org/bizmo/bizmo.owl#supportsFederalAgencyGoal"> [...] </owl:ObjectProperty> [...]
  <owl:DatatypeProperty rdf:about="http://ontologies.socialdataweb.org/fedsheets/omb/ex53/ex53.owl#majorInvestment"> [...] </owl:DatatypeProperty> [...]
  <owl:Class rdf:about="http://ontologies.socialdataweb.org/fedsheets/omb/ex53/ex53.owl#Exhibit53"> [...] </owl:Class>
  <owl:Class rdf:about="http://ontologies.socialdataweb.org/fedsheets/omb/ex300/ex300.owl#Exhibit300"> [...] </owl:Class> [...]
  <!-- Created by Semantic MediaWiki, http://semantic-mediawiki.org -->
</rdf:RDF>
```

- Wiki instance data and metadata *curation* (SME edits) ***maintain class and property specs of ontologies imported off the Web when exported or accessed by other sites/users/apps***

# Browsing Integrated Data on SMW



Special More

The ontology browser lets you navigate through the ontology to easily find and identify items in the wiki. Use the Filter Mechanism at the upper left to search for specific entities in the ontology and the filters below each column to narrow down the given results. Initially the flow of browsing is left to right. You can flip the flow by clicking the big arrows between the columns.  
 Press Ctrl+Alt+Space to use auto-completion. (Ctrl+Space in IE)

Filter Browsing   Reset   Hide instances

Category Tree	Property Tree	Instances	Properties	Values
<ul style="list-style-type: none"> <li>SupportsEnd (open)               <ul style="list-style-type: none"> <li>SupportsAgencyBureauGoal (open)</li> <li>SupportsAgencyBureauObjective (open)</li> <li>SupportsAgencyBureauVision (open)</li> <li>SupportsFederalAgencyGoal (open)</li> <li>SupportsFederalAgencyObjective (open)</li> <li>SupportsFederalAgencyVision (open)</li> <li>SupportsFederalEnterpriseGoal (open)</li> <li>SupportsFederalEnterpriseObjective (open)</li> <li>SupportsFederalEnterpriseVision (open)</li> </ul> </li> <li>SupportsMeans (open)</li> </ul>		009-90-03-00-01-0002-00 (open)	<input type="checkbox"/> no inferred <ul style="list-style-type: none"> <li>SupportsFederalAge... (open) HIE-EHR-HIE</li> <li>SupportsFederalAge... (open) AgencySpecific</li> <li>SupportsFederalAge... (open) ONC</li> <li>SupportsFederalAge... (open) HCR</li> <li>SupportsFederalAge... (open) MeaningfulUse</li> <li>SupportsFederalAge... (open) NHIN</li> <li>SupportsFederalAge... (open) COSS</li> <li>SupportsFederalAge... (open) Connect</li> <li>SupportsFederalAge... (open) UHC</li> </ul>	

Filter: Sup   Filter   Filter   Filter: SupportsFederalAgency   Filter

- Filtering through properties defined by the interlinking vocabulary
- Finds IT topics (instances) that are linked to Management topics

# Conclusion

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- Data.gov is today:
  - One of the largest sets of Open Government RDF data on the Web
- Data.gov tomorrow will explore:
  - Focus on common, domain specific and interlinking vocabularies, and corresponding URI schemes
  - And treat those vocabularies and their instance data as Social media objects on the Social Web
- ***Questions?***

# Thanks For Your Time!

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- Contact me:
  - <http://xri.net/=george.thomas>
- About me:
  - HHS Enterprise Architect
    - CTO Council, member
    - Innovation Council, member
  - Federal CIO Council
    - Architecture and Infrastructure Committee (AIC), Services Subcommittee co-chair
    - Cloud Computing Advisory Committee (CCAC), member
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  - Graduate School, SOA Faculty Instructor