



Architecture for Coalition Cooperation

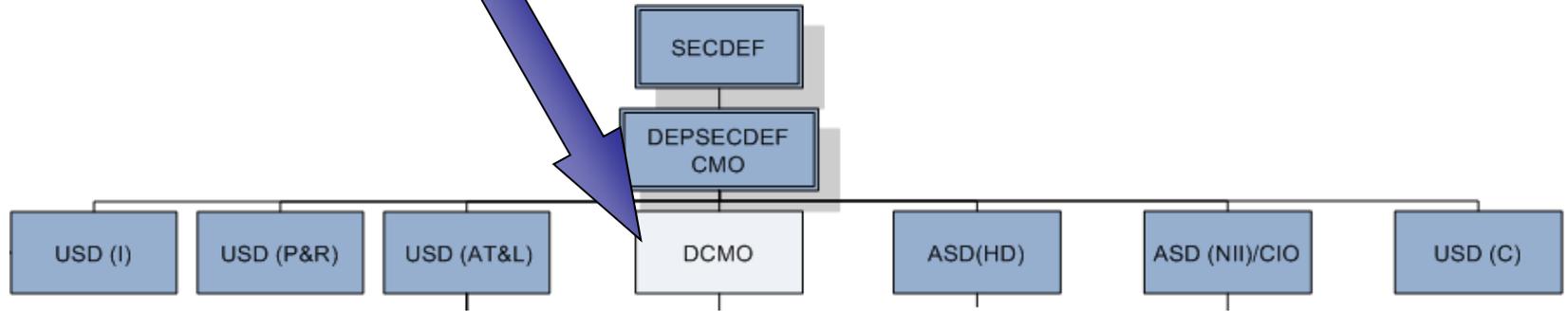
January 24, 2011

Dennis E. Wisnosky,
DoD BMA CTO &
Chief Architect in the
Office of the Deputy Chief
Management Officer



DCMO CTO/CA

Missions of the DoD



Dennis E. Wisnosky, DoD BMA CTO & Chief Architect in the Office of the Deputy Chief Management Officer (DCMO)





The Business Operating Environment

Reach of the Business Mission Area

"The Secretary of Defense is responsible for a half-trillion dollar enterprise that is roughly an order of magnitude larger than any commercial corporation that has ever existed. DoD estimates that business support activities—the Defense Agencies and the business support operations within the Military Departments—comprise 53% of the DoD enterprise."

Global Reach!



57% of DoD I.T. Costs are in Infrastructure

OMB Budget Grouping	Number of Programs	FY2010 IT Spending - \$ Billions
Communications and Computing Infrastructure	1,547	\$16.3
Information Assurance Activities	353	\$3.2
Functional Area Applications	3,244	\$13.2
Related Technical Activities	156	\$1.0
Total DoD IT Spending	5,300	\$33.7

Enterprise Challenges!

Issue: Infrastructure

DoD Contractors Build Separate Infrastructures & Dictionaries

SOURCE: <http://www.whitehouse.gov/omb/e-gov/>

Issue: Redundancy

DoD Projects Have Own Data

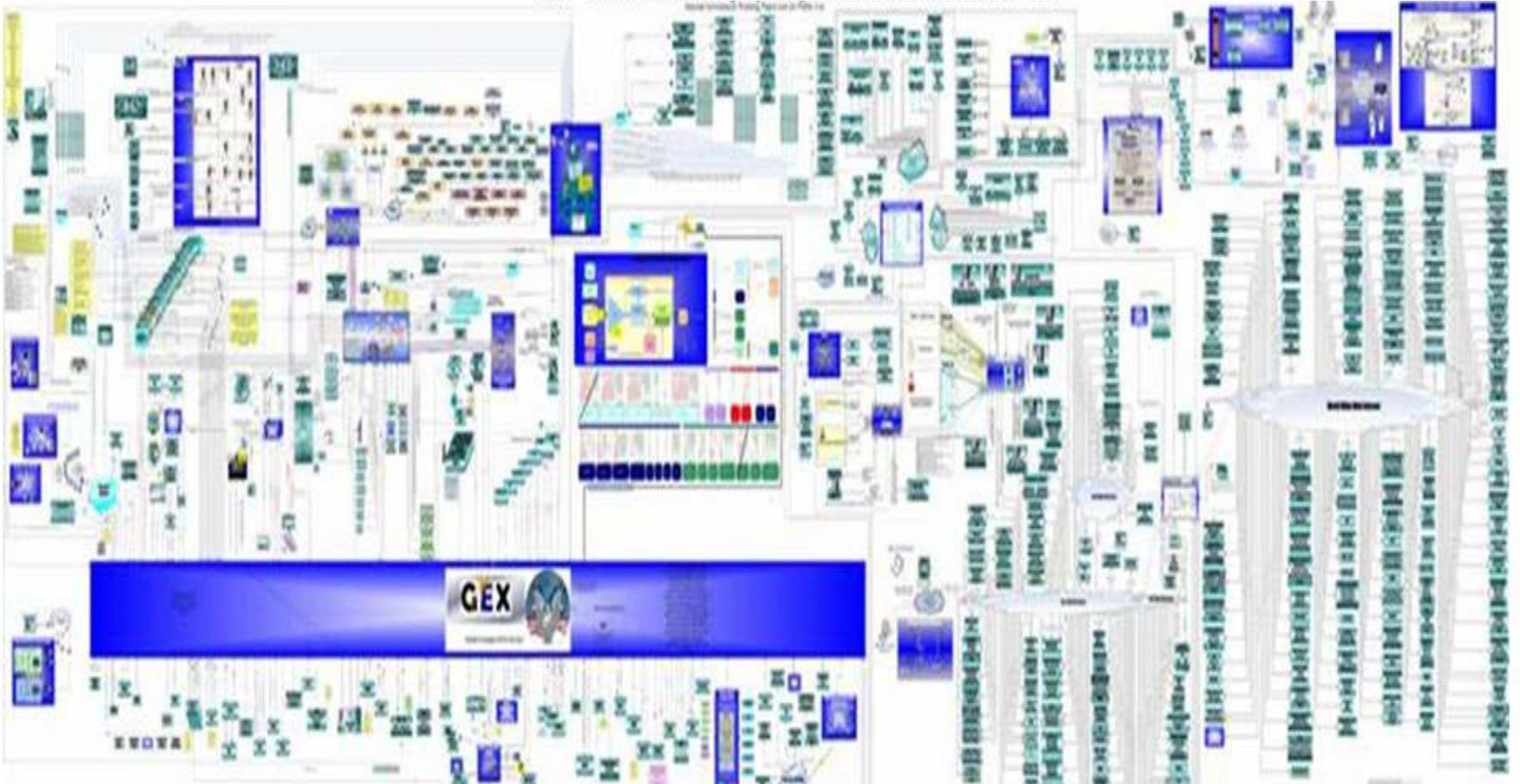
Projects	07 Budget \$ Millions	Number of Projects	% of Total Budget \$	% of Projects
Project - > \$100 Million	\$10,301	43	33.9%	1.3%
Projects - > \$10 Million	\$15,013	525	49.4%	15.4%
Projects - < \$10 Million	\$5,066	2,832	16.7%	83.3%
Total	\$30,380	3,400	100.0%	100.0%

\$ Billions	FY05	FY06	FY07
Total DoD I.T. Spending	\$28.7	\$29.9	\$30.4
DoD Spending on Contractors	\$21.1	\$22.6	\$24.1
% of I.T. Spending Contracted Out	73.5%	75.6%	79.3%

Issue: Data



A Small Slice of the As-Is



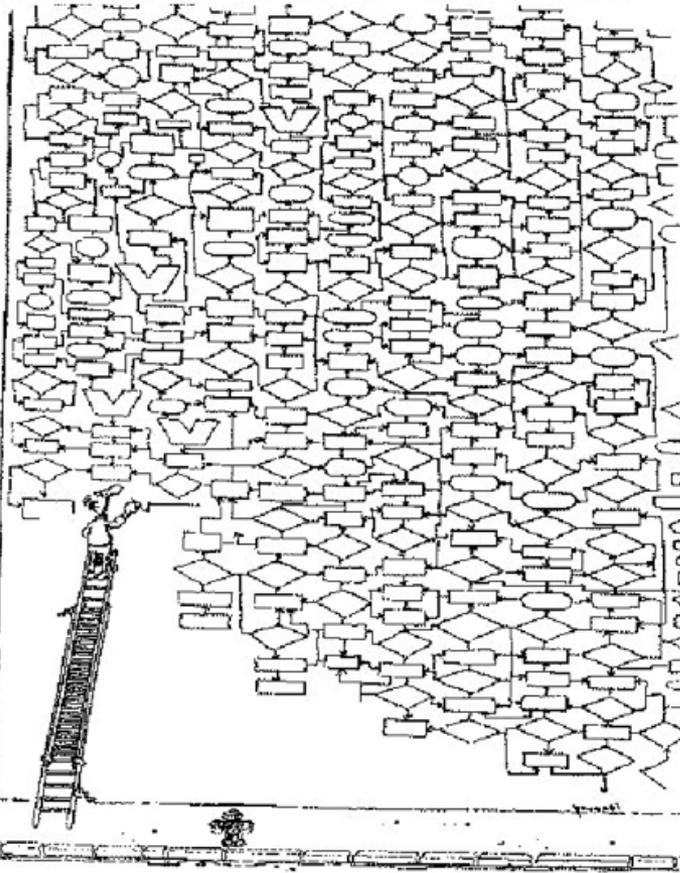
**We Must Make Sense Out of This –
But In A Standard Way!**



Other Disciplines Can Do It

Not This

But This:



Resistor symbol



Capacitor symbol



This agreed upon representation of electrical engineering allows a common understanding...



But...



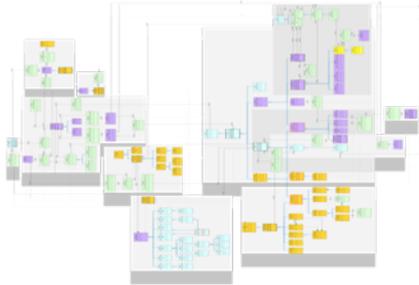
Why is this hard?



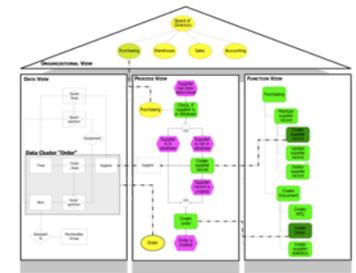
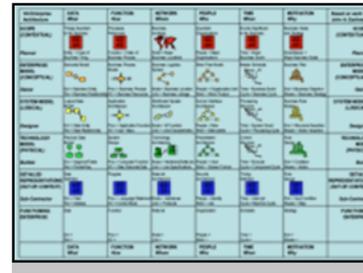


Enterprise Architecture

➤ Many Frameworks



	Function View	Information View	Resource View	Organization View
Requirements Definition	<ul style="list-style-type: none"> Domains Domain Processes Business Processes Enterprise Activities Events 	<ul style="list-style-type: none"> Enterprise Objects Object Views Object Relationships Information Elements Integrity Rules 	<ul style="list-style-type: none"> Capabilities 	<ul style="list-style-type: none"> Responsibility Authority
Design Specification	<ul style="list-style-type: none"> Specified Functional Operations 	<ul style="list-style-type: none"> External Schemata Conceptual Schemata Integrity Constraints Database Transaction Times 	<ul style="list-style-type: none"> Specified Capabilities Specified Resources Specified Resource Units 	<ul style="list-style-type: none"> Organization Units Organization Cells
Implementation Description	<ul style="list-style-type: none"> Implemented Functional Operations 	<ul style="list-style-type: none"> Implemented External Schemata Internal Schemata Logical Data Schemata Physical Data Schemata 	<ul style="list-style-type: none"> Implemented Capabilities Implemented Resources Implemented Resource Units 	<ul style="list-style-type: none"> Implemented Organization Units Implemented Organization Cells



➤ Many Views



➤ Many Techniques

- UML, IDEF, BPMN, RAD, EPC, PowerPoint and many, many others...



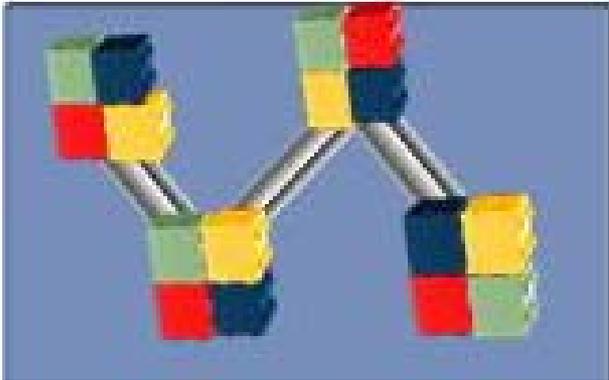
Game-Changing Innovations

Common Vocabulary and Primitives

- If we can precisely state requirements and precisely describe data/services, we will be able to find them and know how to use them to facilitate:
 - Integration and Interoperability
- We must describe both the data/services and requirements with enough precision to accomplish the goal
- We use:
 - BPMN/Primitives for business mission descriptions
 - OWL and RDF for domains, services, data, capabilities and requirements descriptions



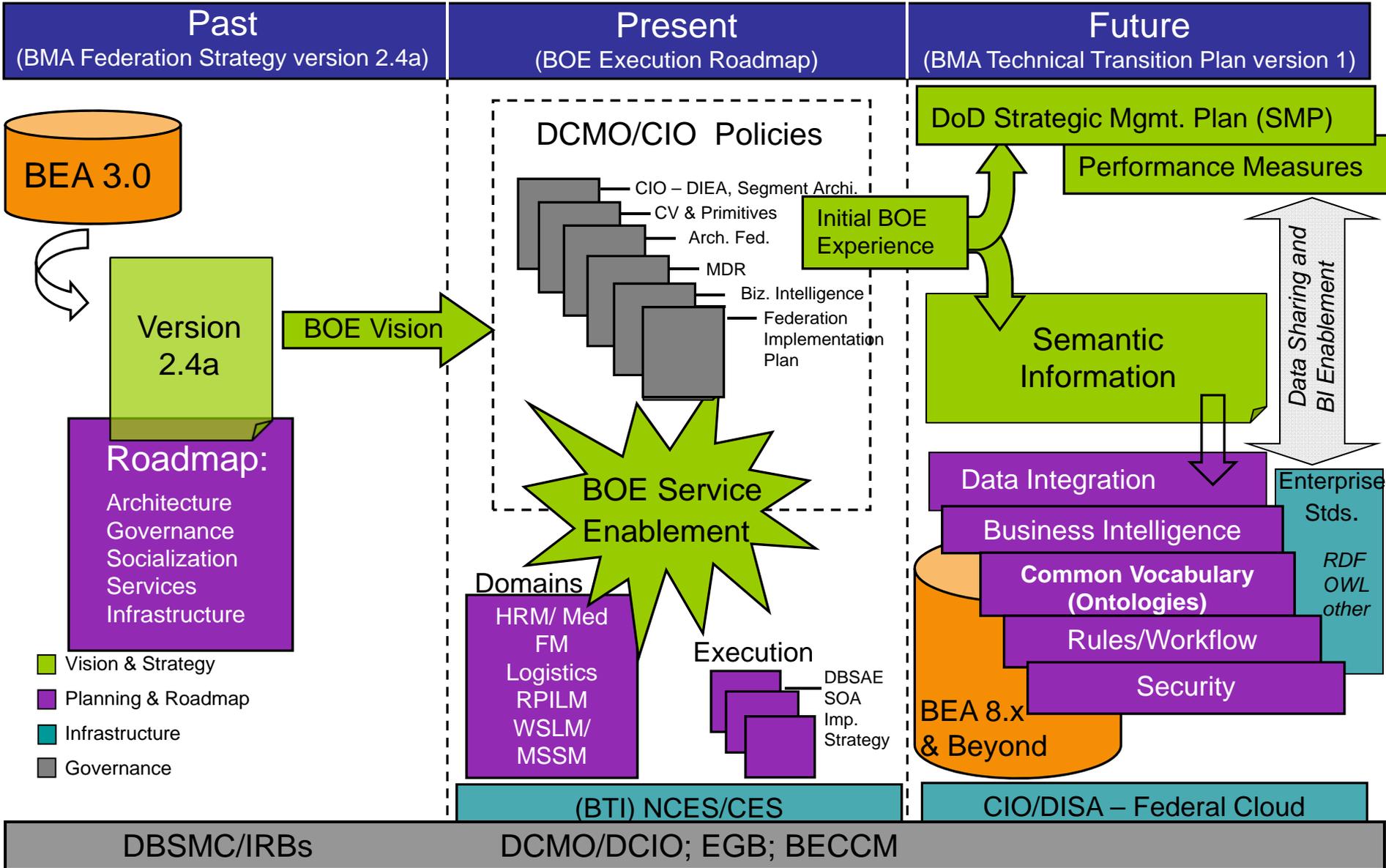
To-Be State



Dynamic, event-driven
reconfiguration of services



Strategy and Roadmap for DoD Business Operations Transformation





Standards-based Architecture - Primitives



Standard Symbols

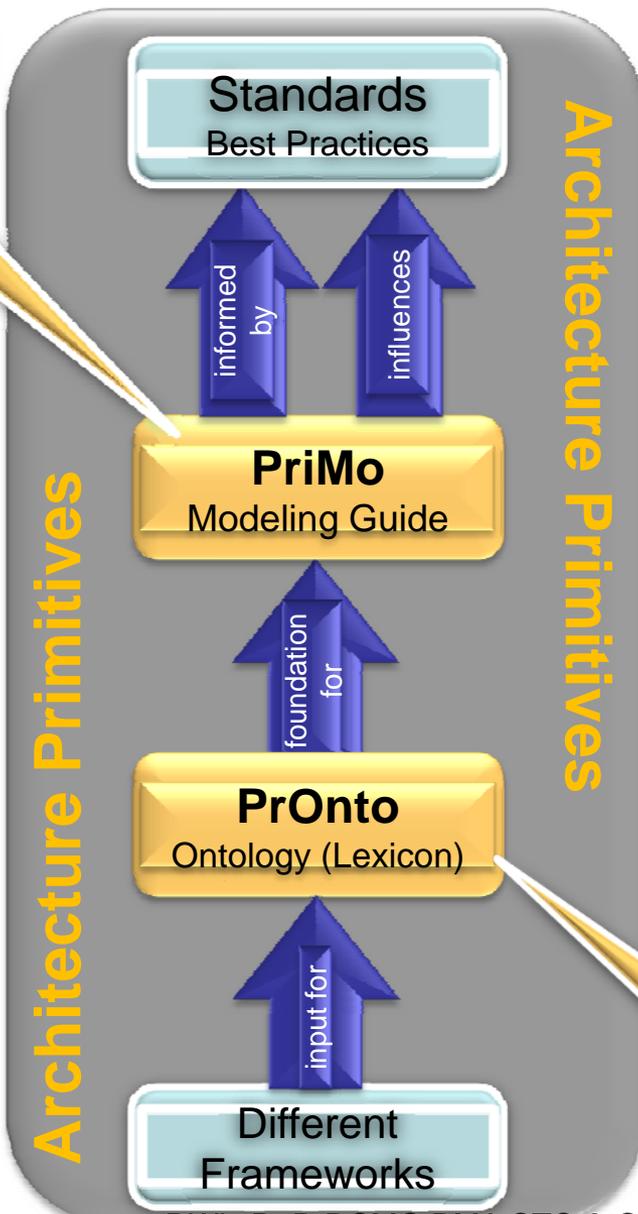
Engineering Language and Symbols:

Resistor symbol

Capacitor symbol

This agreed upon representation of electrical engineering allows a common understanding...

- DoDAF 2.0 serves as the foundation for architecture primitives
- Use Cases being developed and used to drive pilots



Modeling: Primitives!

Music Language and Symbols:

Music Scale symbols

Notes symbols

This agreed upon representation of music allows a common understanding...

Standard Language (terms and definitions)





Architecture Primitives Series

Vocabulary-Driven Enterprise Architecture Guidelines for DoDAF AV-2: Design and Development of the Integrated Dictionary
December 17, 2009

BUSINESS TRANSFORMATION AGENCY

Term	Definition	Acronym	Synonym
Terminal Air Control	Process on the ground providing the air support for the operations of the DoD mission.	TAC	
Target	Organizational object		
Time Region Control Measure	Activity that starts and ends		
Chain of Support	Activity, business process, or other		
Asset Damage Management	Asset damage management		
CAS Request	Request for CAS		
Immediate Command and Control Point	Officer in the field		

Enterprise Architecture based on Design Primitives and Patterns Guidelines for the Design and Development of Event-Trace Descriptions (DoDAF OV-6c) using BPMN
December 17, 2009

BUSINESS TRANSFORMATION AGENCY

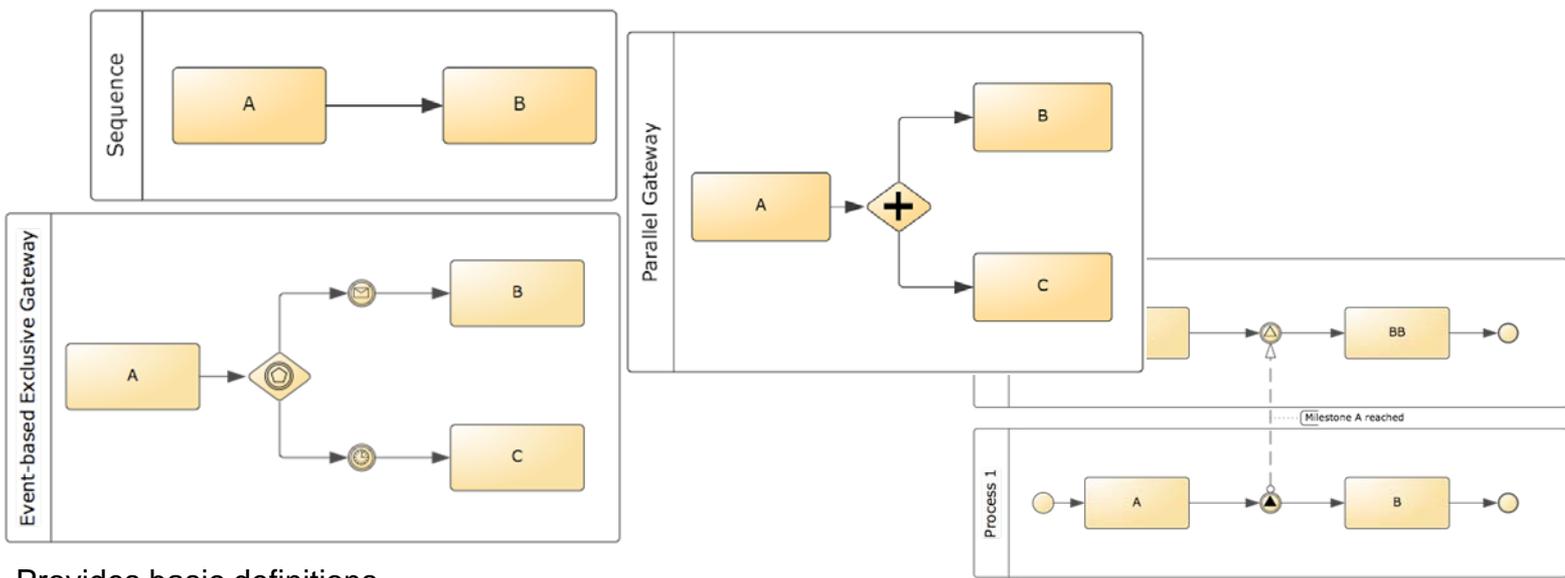
Well Documented Intentions!

DoD Architecture Framework Processes Best-Practice

http://cio-nii.defense.gov/sites/dodaf20/journal_exp3.html



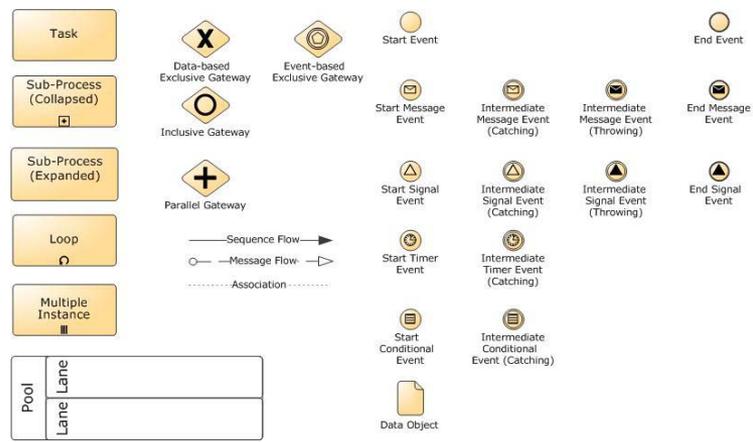
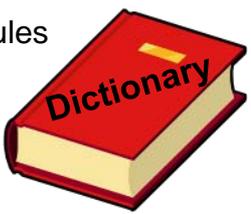
Primitives Lead To Patterns



PriMo

- Provides basic definitions of the architecture model semantics
- Provides elementary rules for the connectivity of primitive constructs
- Provides foundation building blocks for constructing architecture products
- Caveat: A common vocabulary by itself does not guarantee high quality products

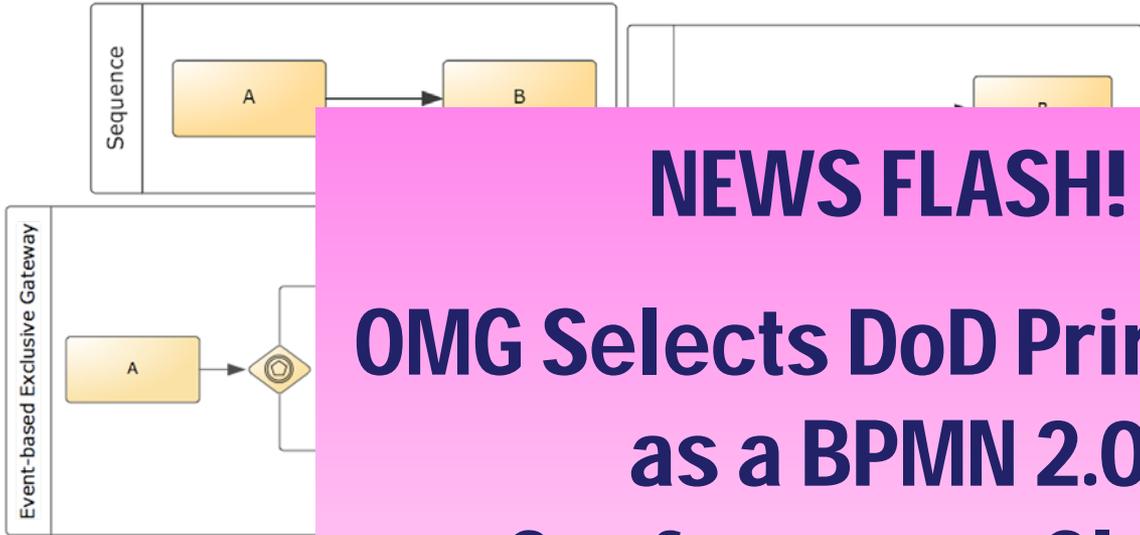
PrOnto



- A style guide provides subjective advice that will ensure the design of high quality products
- A style guide advises on
 - Choice of words
 - Which constructs are appropriate in a given situation
 - Choice of grammar
 - How to combine constructs to maximum effect



Primitives Lead To Patterns



NEWS FLASH!
OMG Selects DoD Primitives
as a BPMN 2.0
Conformance Class!

Will Industry Care?



PriMo

- Provides basic definition of the architecture model semantics
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style guide provides objective advice that will ensure the design of high quality products

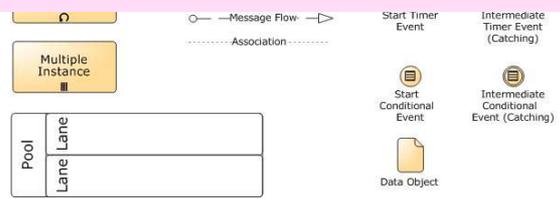
style guide advises on

- Choice of words

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– Choice of grammar

- How to combine constructs to maximum effect





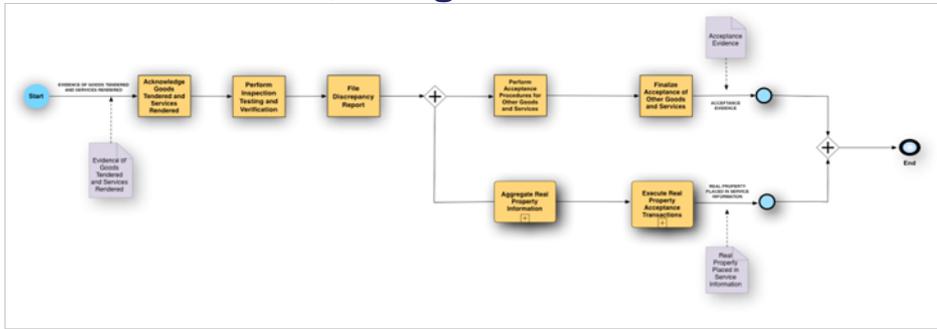
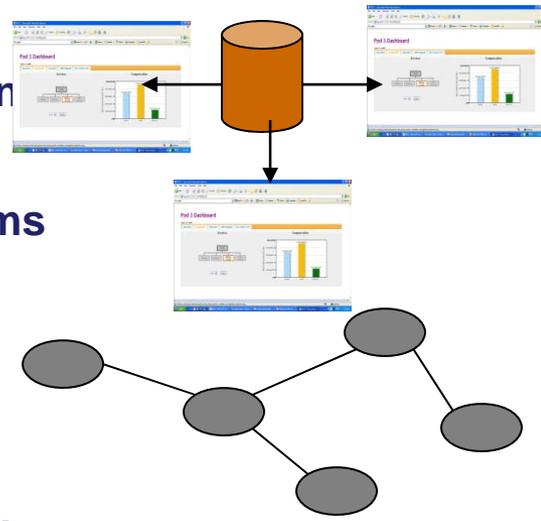
We Are Underway!





BEA Solution Statement

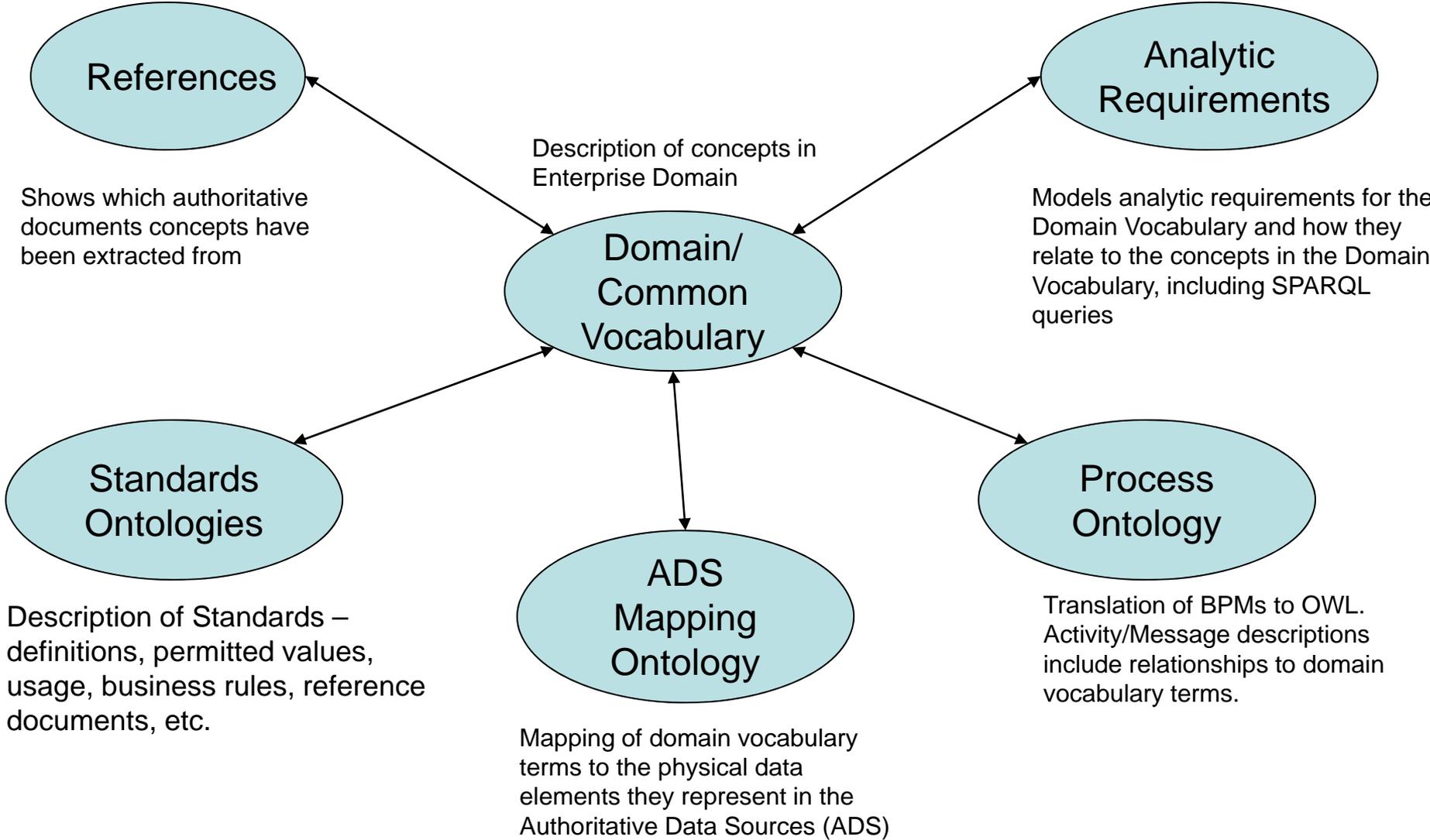
- **Visibility:** pull & display (vice store!) enterprise information directly from the authoritative data sources
- **Agility:** plug-and-play federated environment so new systems or analytical needs can come online and go offline without disrupting the overall environment
- **Access:** build federation into the solution
- **Standards:** leverage BPM and Semantic Web technology standards (RDF/OWL) developed by DARPA and approved by W3C and OMG
- **Savings:** People readable Architecture, Machine readable Architecture, Executable Architecture, Long-term re-use of authoritative data





DoD BEA Ontology

Ontology = what I know about a particular thing





Common Vocabulary Development

Ontology is a "common vocabulary"

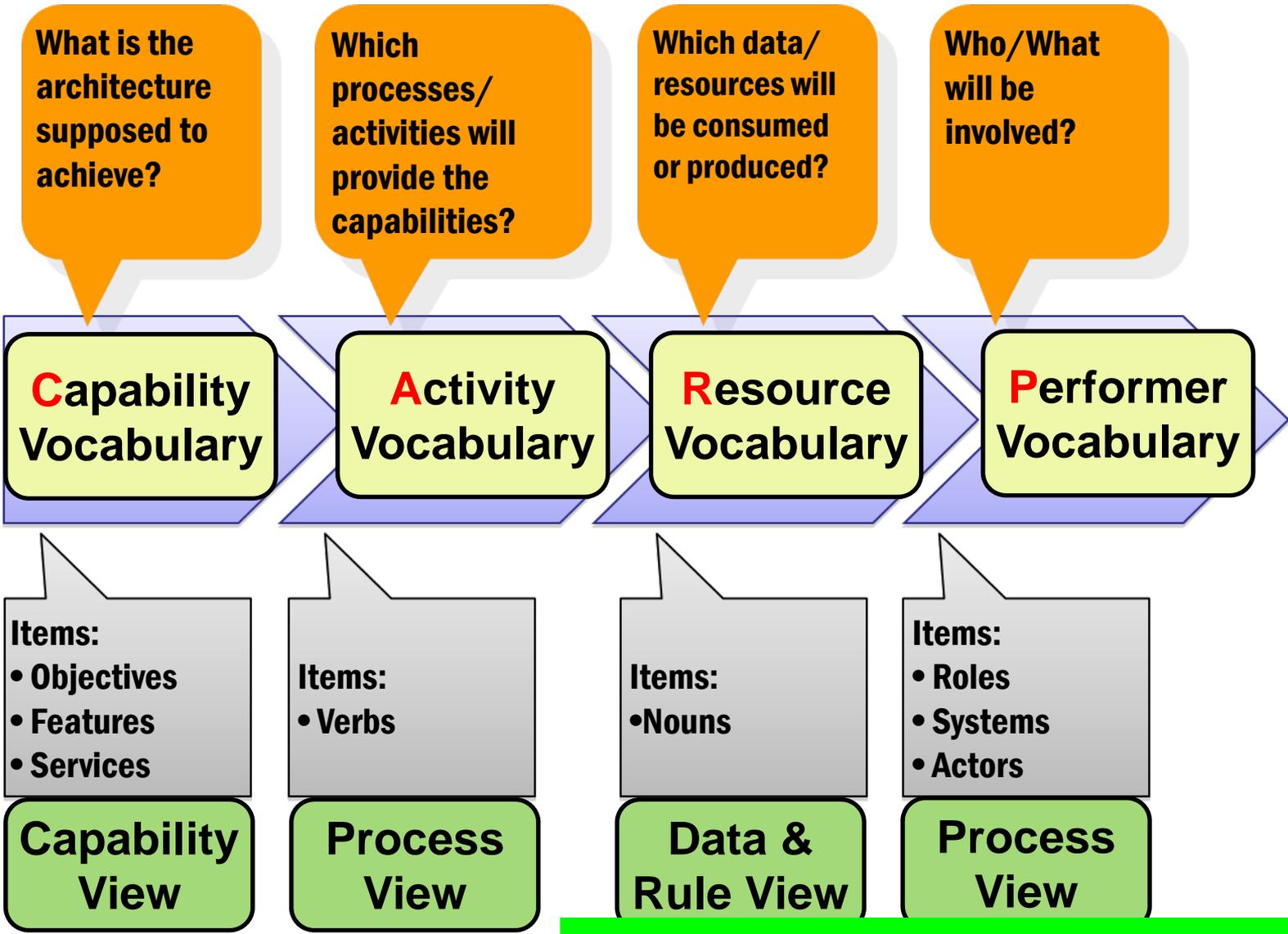
- Identify information to communicate
- Agree on terms and contextual use
- Communicate



"Now! *That* should clear up a few things around here!"



Building Common Vocabularies

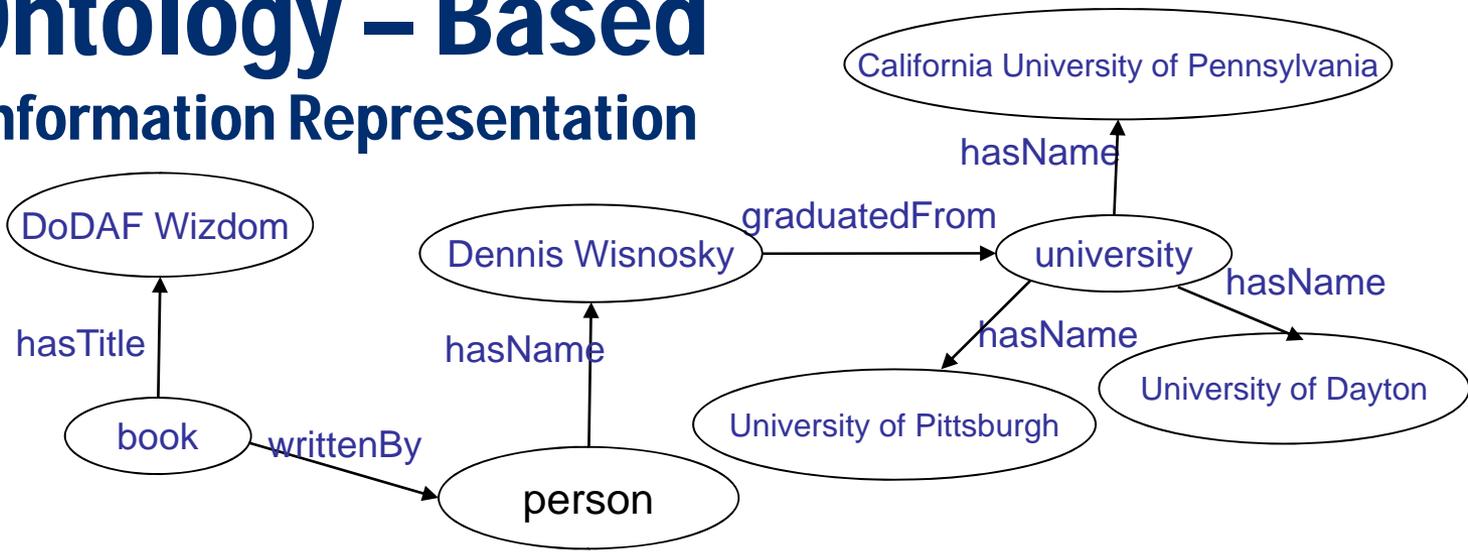


How to get a common vocabulary



Ontology – Based Information Representation

DBpedia
(Wikipedia)
Dataset



Graph1

Who wrote “DoDAF Wizdom”?

Common Vocabulary in Action!

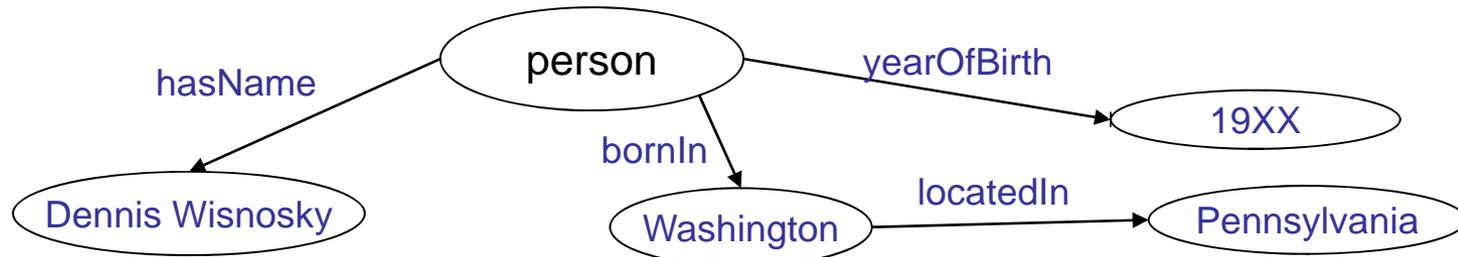


Ontology – Based Information Representation

Where was Dennis Wisnosky born?

Graph2

DoD HR
Dataset

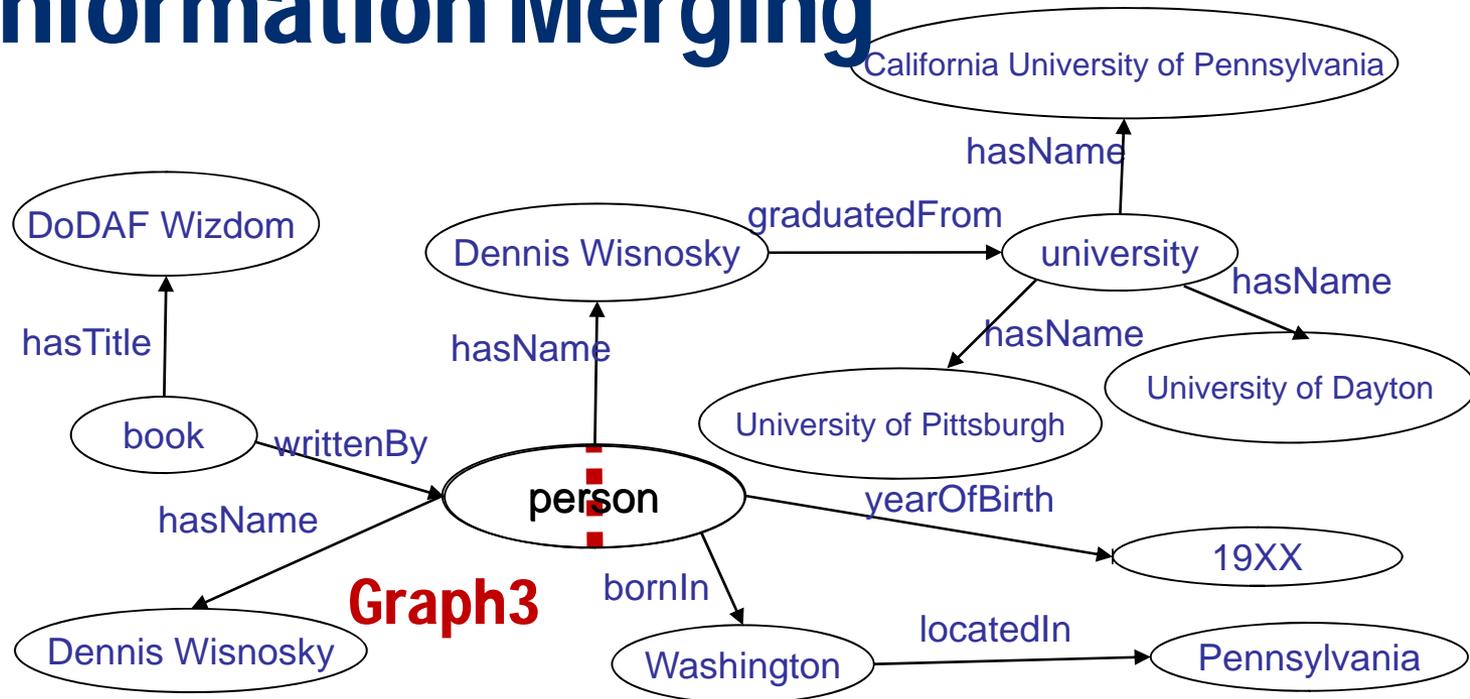




Information Merging

DBpedia
(Wikipedia)
Dataset

DoD HR
Dataset



Wikipedia Dataset: Who wrote “DoDAF
Wizdom”?

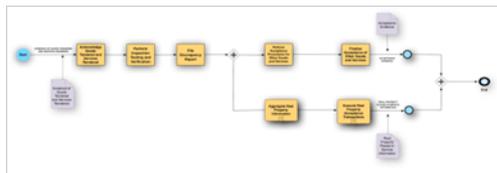
DoD HR Dataset: Where was Dennis
Wisnosky born?

Combined Dataset: Where was the person who
wrote DoDAF Wisdom
born?

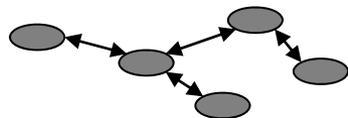
HR EIW Technical Summary!



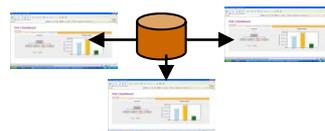
Many DoD and Industry Participants, Learning!



Makes full use of Business Process Models Built on BPMN (OMG) Standard!



Built with Open Source Software and Open Standards (W3C)!



Ad Hoc and Standard Displays use ADS!



Implemented in the 'Cloud'!



90 Day Deliverables!

The road to the EIW



Built on a Shoe String!



Use Case – Country View: User Defined Query

Google Maps Demo

http://184.72.247.236:8080/pod3/

Spry Enterprises, Inc. M3O.mil CommonVocab Queries and Views Templates Calendar Pandora Radio - List... Personal Email M3O BigTime: Main Menu

Pod 3 Dashboard

Map Compensation Separation **UCC Country View**

Map Satellite Hybrid Terrain

Language Other Other

Select Desired Language:

FRENCH

HAITIAN CREOLE

Select months since members last deployment:

Select months until member is eligible to retire:

Submit

NORTHCOM, 55%

SSN	First Name	Last Name	Loc.	Rank	Primary MOS	uuc
664887701	CukymGrHzY	PAqImqJmX	51	MAJ	MOS180	NORTHCOM
1040784003	dqfKjpcLeZ	ciXksH0T5	06	1STSGT	MOS8999	NORTHCOM
2060149898	TJzzRuUcrrw	FaWZn5xZ0s	06	SGT	MOS321	NORTHCOM
2886040741	XnazuYKSEg	cFAWmVTUlm	08	LTCOL	MOS202	NORTHCOM
240226098	KcVVSFohqY	kBkWiCmTal	51	SGT	MOS3531	NORTHCOM
2768415363	VfYbafiiyC	RrmrezLQgb	BG	SSGT	MOS2671	PACOM
3395337019	qVEhcxLJKOp	lPGIibVqOr	51	CPL	MOS4641	NORTHCOM
2313602753	SIUhsCyABW	sDionznFxr	BG	SGT	MOS341	PACOM
350157891	TtbKjntNAK	VXStisZPDM	51	SSGT	MOS431	NORTHCOM
613173606	lDJwIuEErp	GpZbpatiWY	1Z	LTCOL	MOS302	CENTCOM
2803128426	siaTKGHlUh	SPJGquuHVf	51	GYSGT	MOS6276	NORTHCOM
Total						Members:20

Dialog

About



Agile, Architecture-Driven, DoD Business Capability Delivery

Governance
Policy, Processes, Tiered Accountability

The One Take Away

Model
Common Architecture Methodology
Common Vocabulary
Standard Representation and Composition
Primitives and Design Patterns

Data
Authoritative Data Sources
Semantic Technologies

Implement
Phased Implementations
Agile Business Services Delivery

Model to Guide Transformation
Data to Improve Performance
Implement to Deliver Capabilities



For the rest of the story!

Common Defense Quarterly

The Journal for International Defense Cooperation



Thank you!

Questions?
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