



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

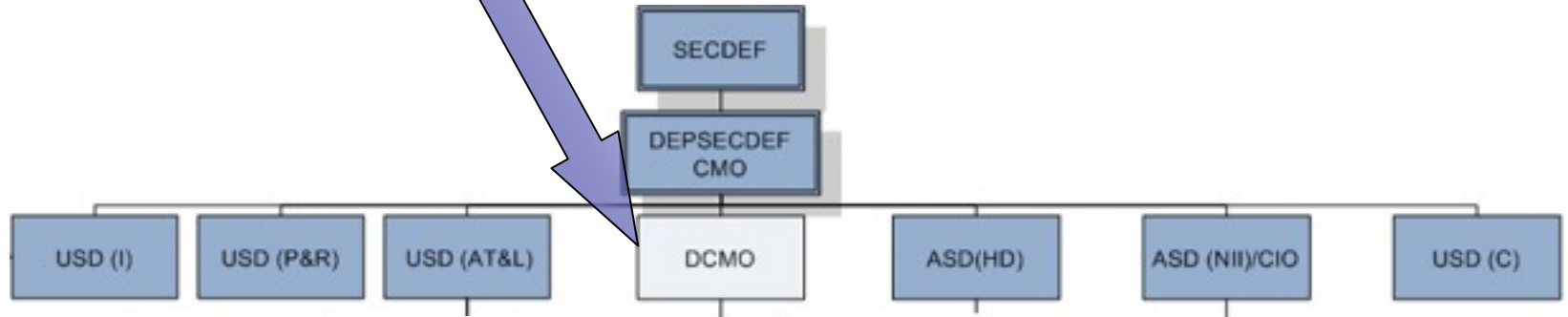
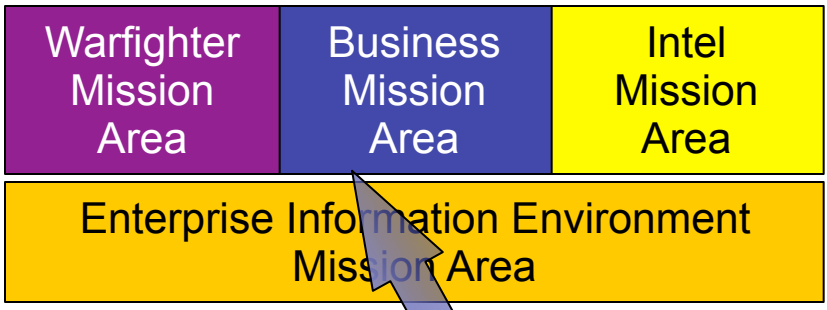
Primitives and Style: A Common Vocabulary for SOA - Reducing Risk and Costs while Improving Collaboration and Agility

September 15, 2010



DCMO CTO/CA

Missions of the DoD



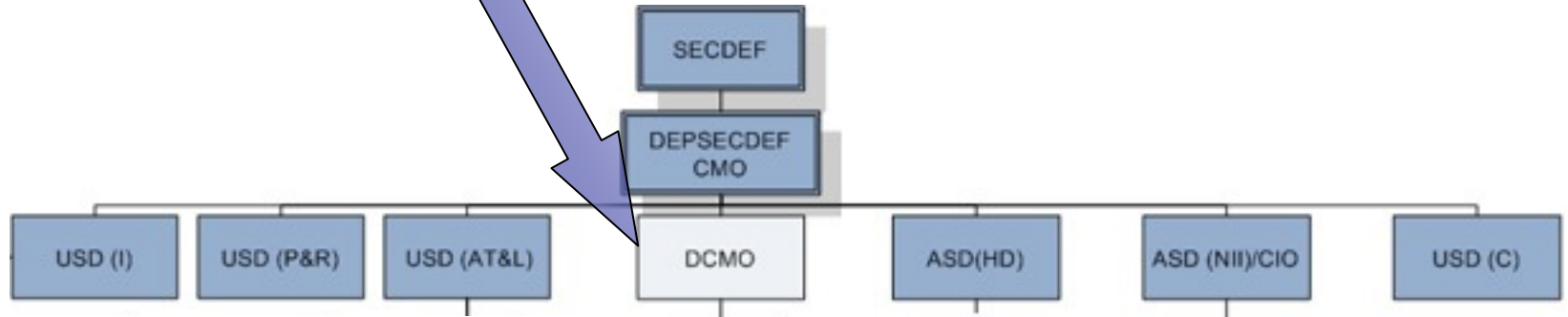
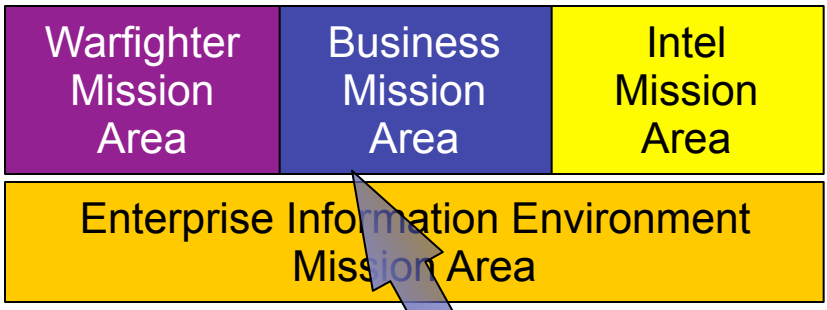
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DCMO CTO/CA

Missions of the DoD



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Global Reach!



The Business Operating Environment

Reach of the Business Mission Area





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."





The Business Operating Environment

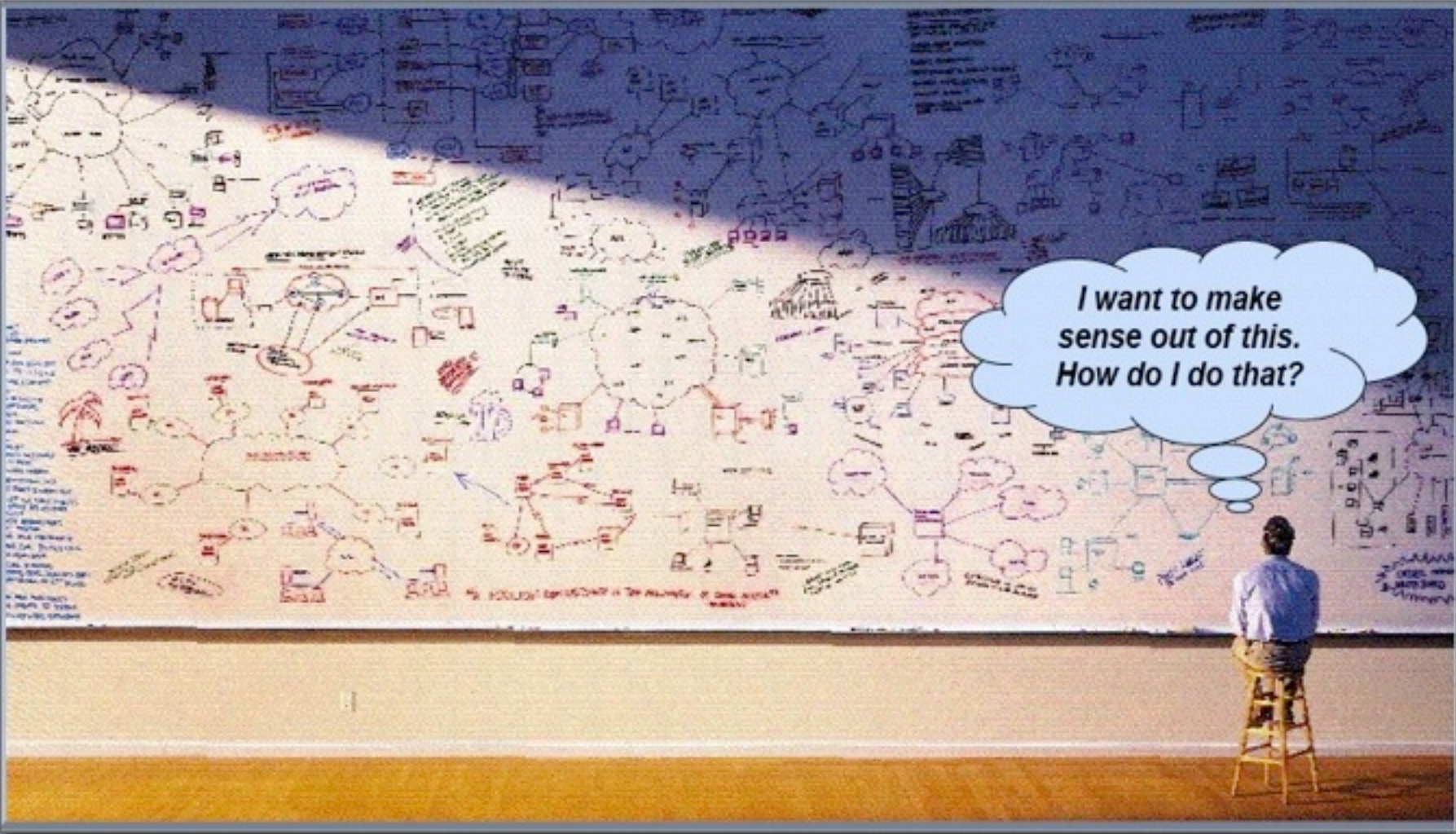
Reach of the Business Mission Area

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The Challenge!

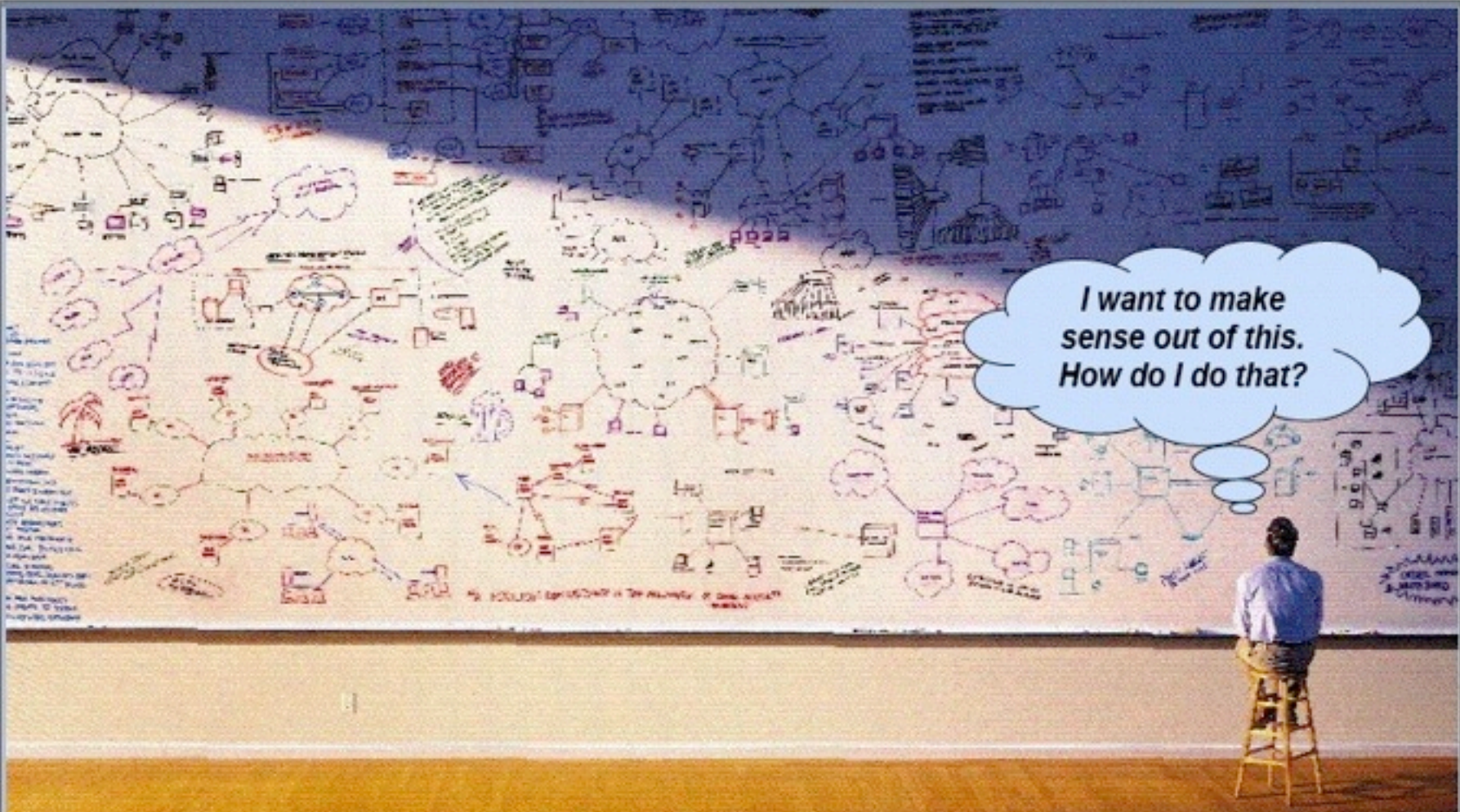


The Challenge





The Challenge



Issue: Infrastructure



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

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



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Issue: Data



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%



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Issue: Redundancy



DoD Contractors Build Separate Infrastructures & Dictionaries

\$ 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%



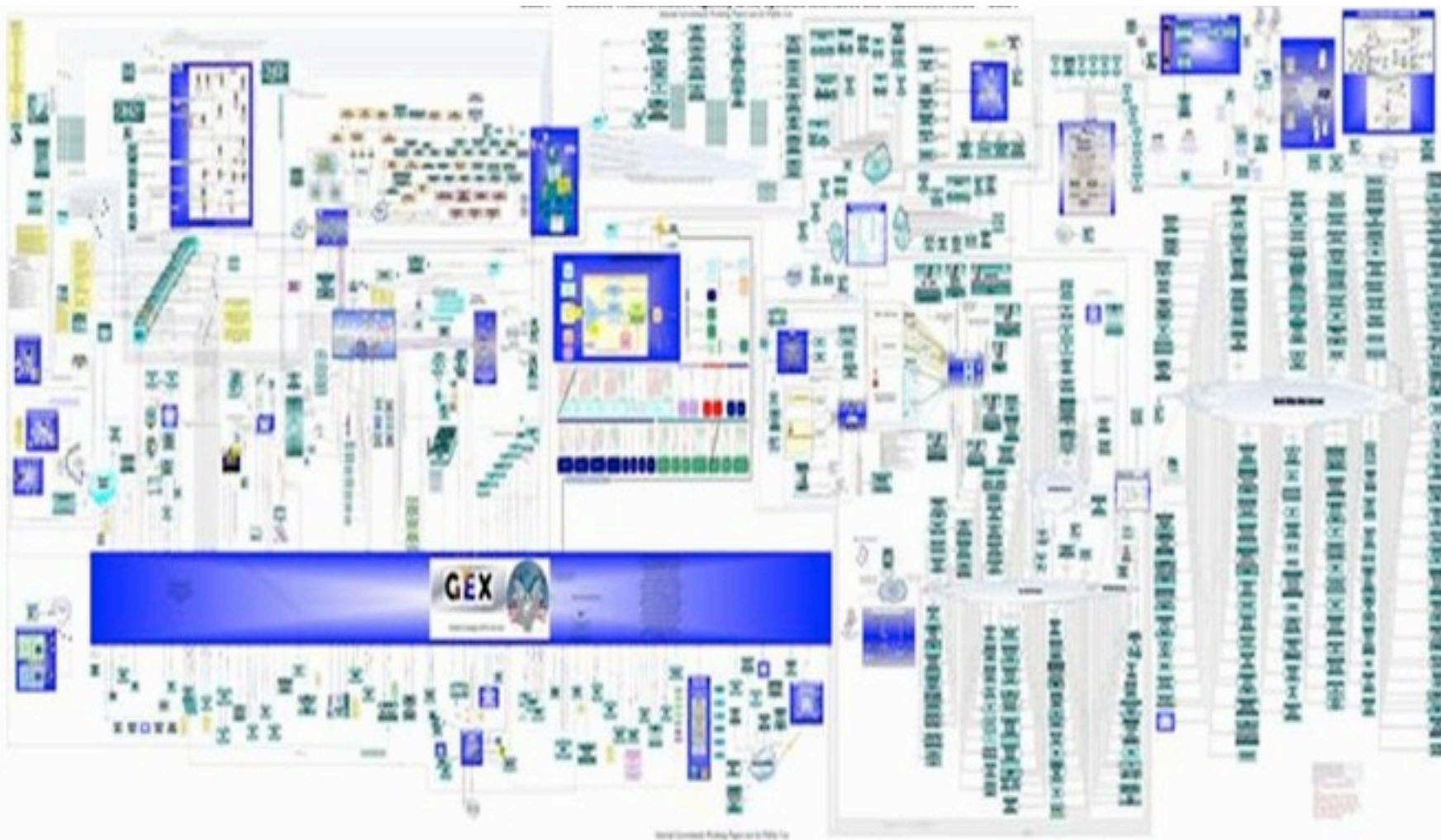
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Small Slice of the As-Is



A Small Slice of the As-Is





A Small Slice of the As-Is



We Must Make Sense Out of This!



A Small Slice of the As-Is



We Must Make Sense Out of This!

Game-Changing Innovations!



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



Game-Changing Innovations

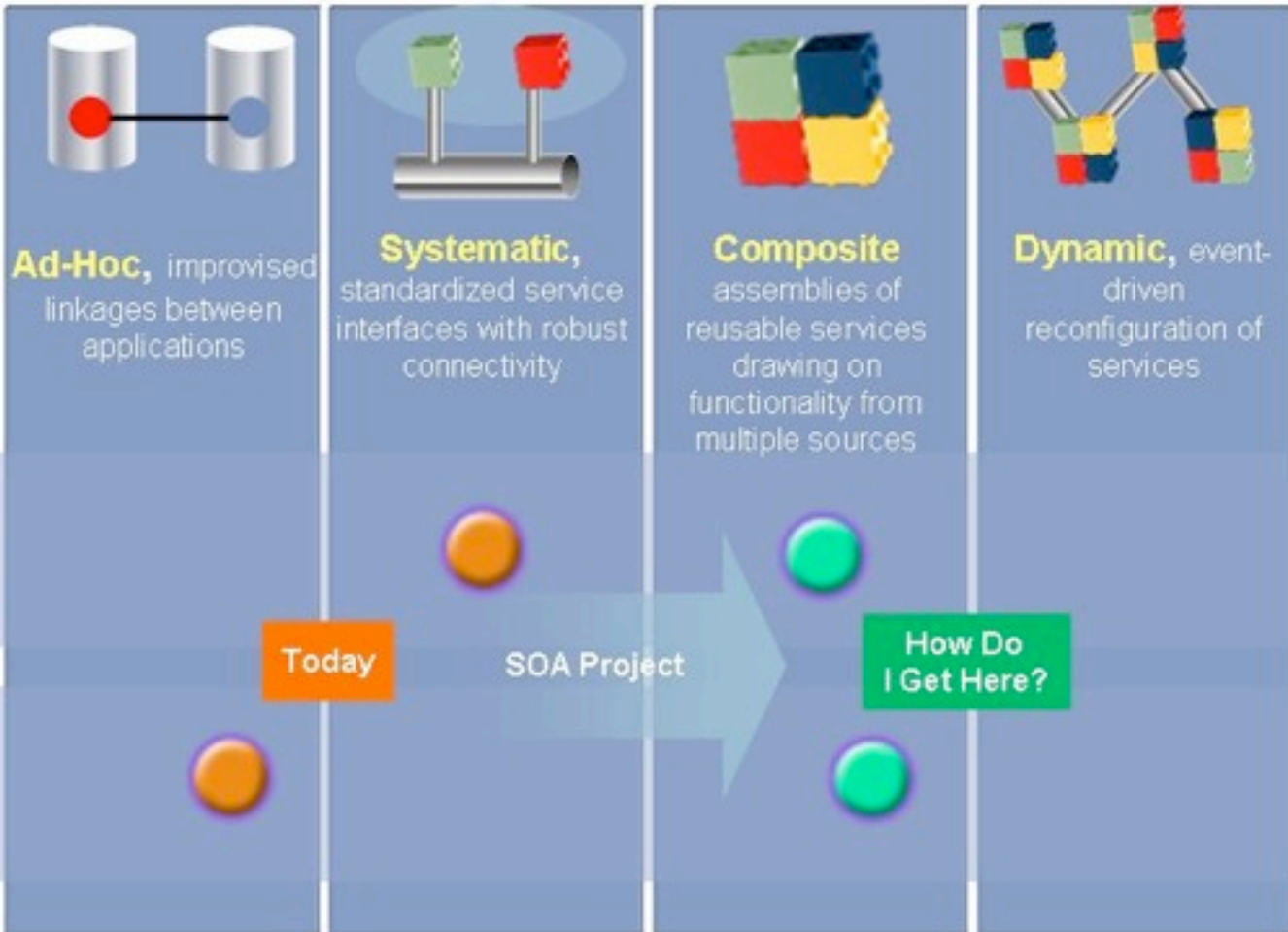
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As-Is : To-Be



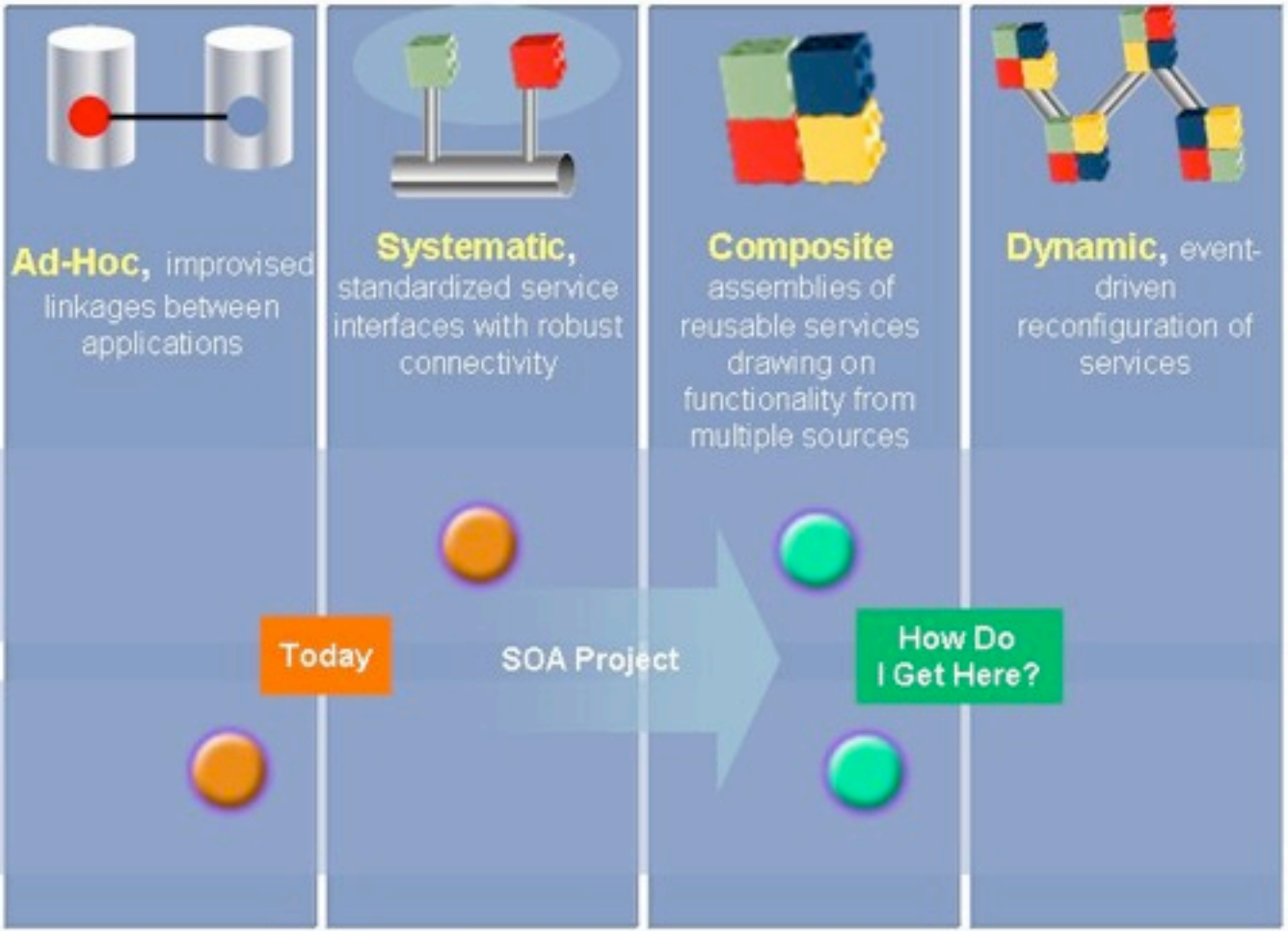
As-Is:To-Be



Source: What's New!
IBM SOA Maturity Model



As-Is:To-Be



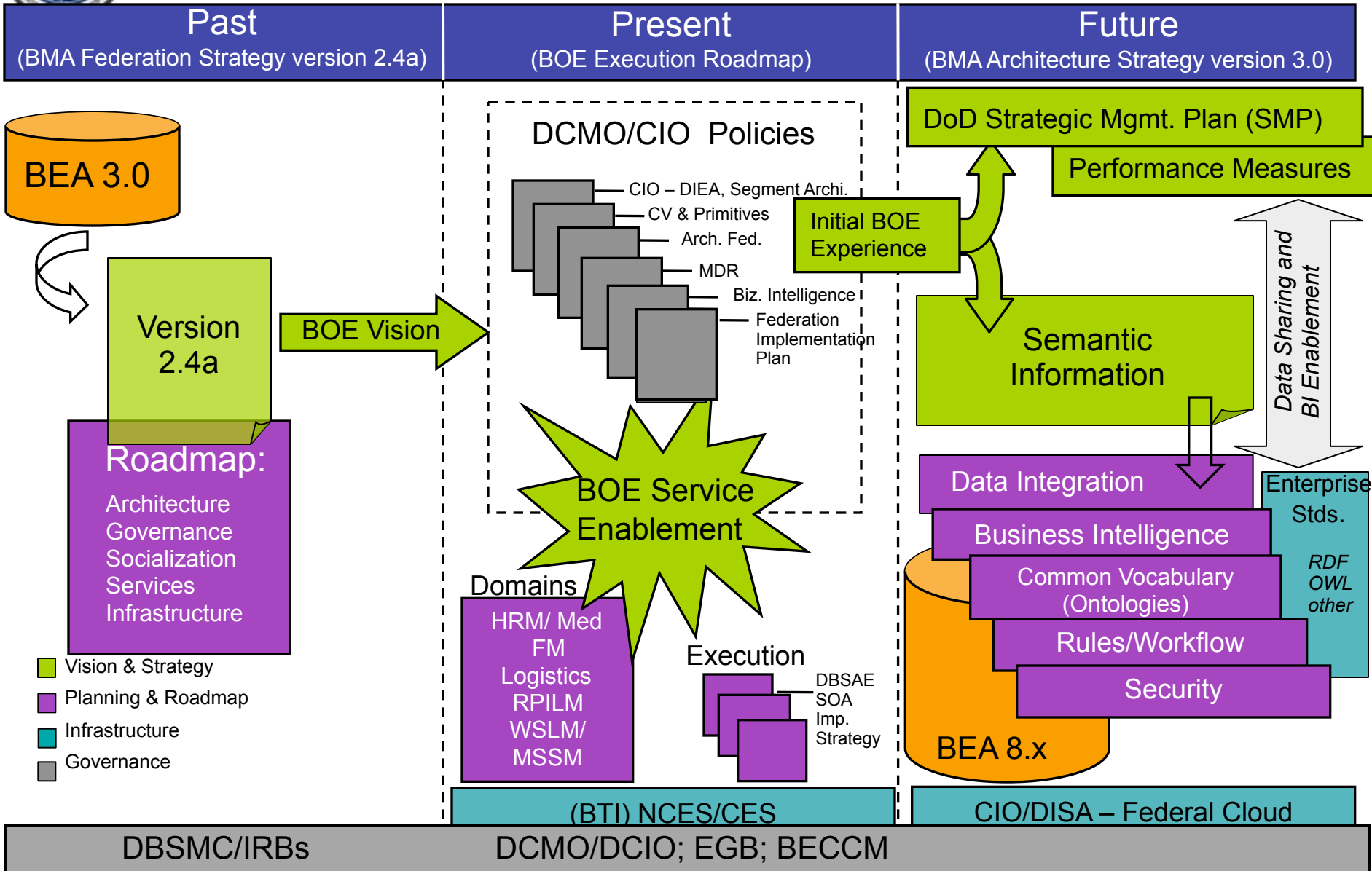
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IBM SOA Maturity Model

DoD Business Operations Strategy and Roadmap!

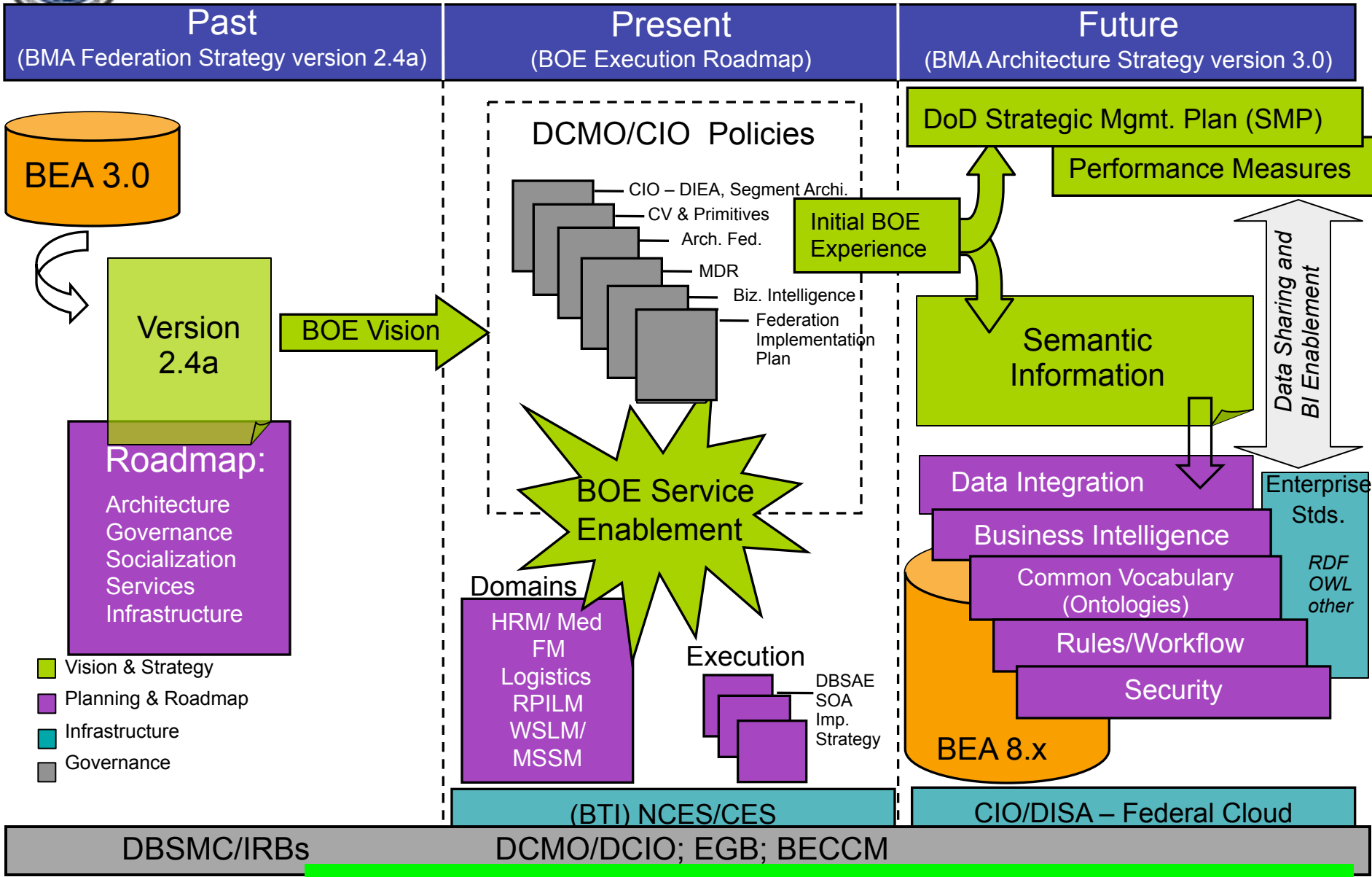


Strategy and Roadmap for DoD Business Operations





Strategy and Roadmap for DoD Business Operations



Business Operations thru Semantic web Solutions



Business Operations thru

- Semantic Web Initiative
 - Business IT development methodology 3-step pattern
 - Modeling the business capability to be deployed
 - Preparing and populating a modern information model and data store
 - Implementing the capability by deploying business services
 - “Model-Data-Implement” semantic web pattern is designed to field capabilities in 60-90 days; this supports the Departments goal to move away from monolithic systems that take years to deploy
 - Current application of this pattern to achieve high performing business operations:
 - Enterprise Information Web (EIW)
 - Performance Data Automation (PDA)
 - DCMO is preparing policy and instructions to fully instantiate the Semantic Web initiative and take advantage of W3C and OMG standards and semantic technologies that the commercial sector is widely deploying



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Modeling: Primitives!



Standards-based Architecture - Primitives

Modeling the business capability to be deployed



Standard Symbols

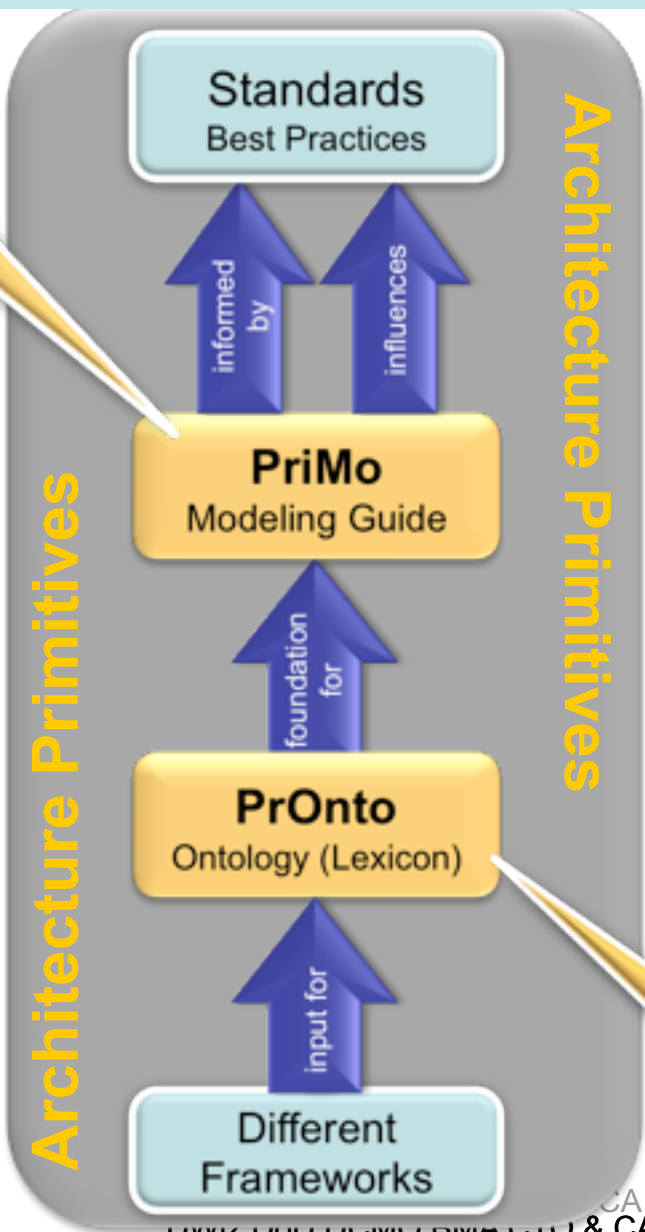
Engineering Language and Symbols:

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



Music Language and Symbols:

Music Scale symbols

Notes symbols

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

Standard Language (terms and definitions)





Standards-based Architecture - Primitives

Modeling the business capability to be deployed



Standard Symbols

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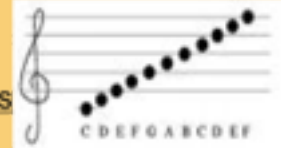
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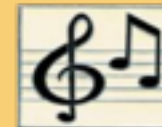


Music Language and Symbols:

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



Architecture Primitives

Architecture Primitives

Standards Best Practices

informed by

influences

PriMo Modeling Guide

foundation for

PrOnto Ontology (Lexicon)

input for

Different Frameworks

Standard Language (terms)



Well Documented Intentions!

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



Architecture Primitives Series

Modeling the business capability to be deployed



DoD Architecture Framework Processes Best-Practice

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



Architecture Primitives Series

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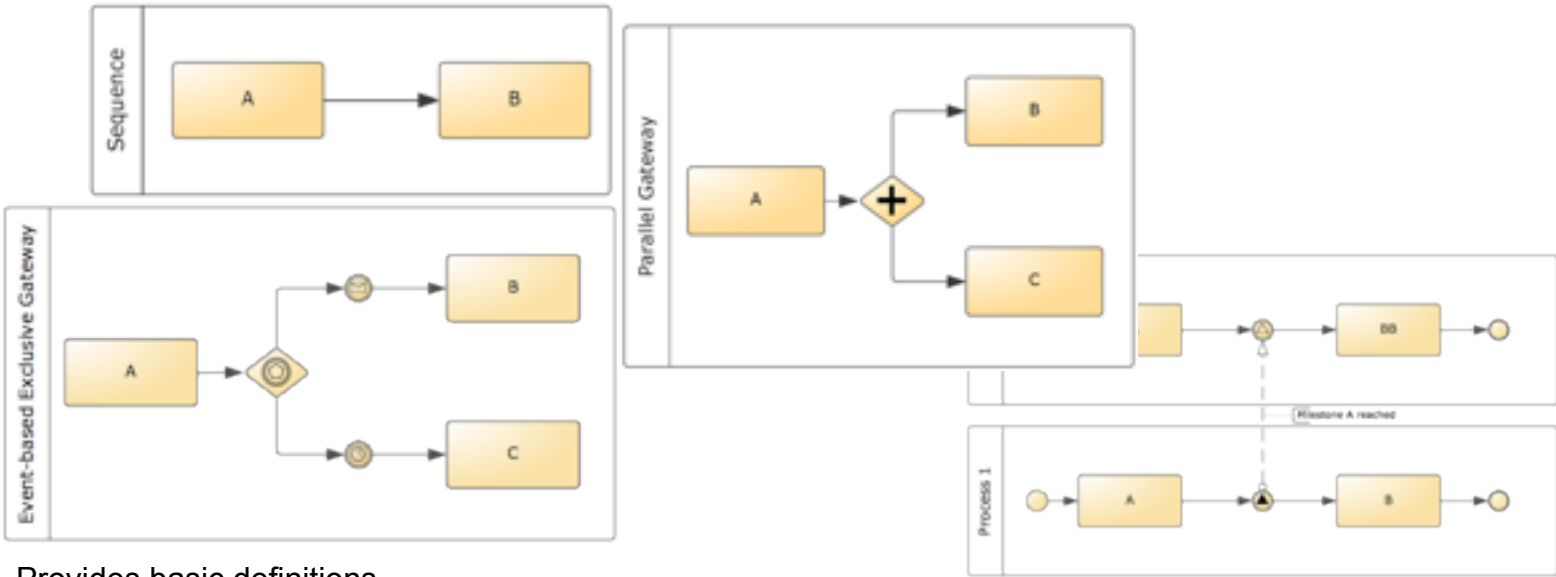
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Primitives lead to Patterns



Patterns & Primitives

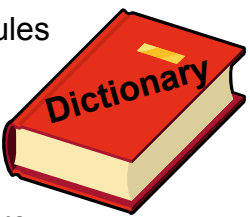
Modeling the business capability to be deployed



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



Patterns & Primitives

Modeling the business capability to be deployed

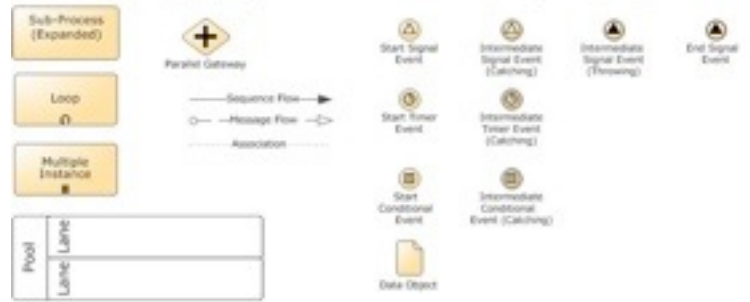
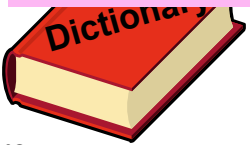


NEWS FLASH!
**BPMN 2.0 Analytic
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Patterns & Primitives

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Will Industry Care?



We Are Underway!

Modeling the business capability to be deployed





We Are Underway!

Modeling the business capability to be deployed



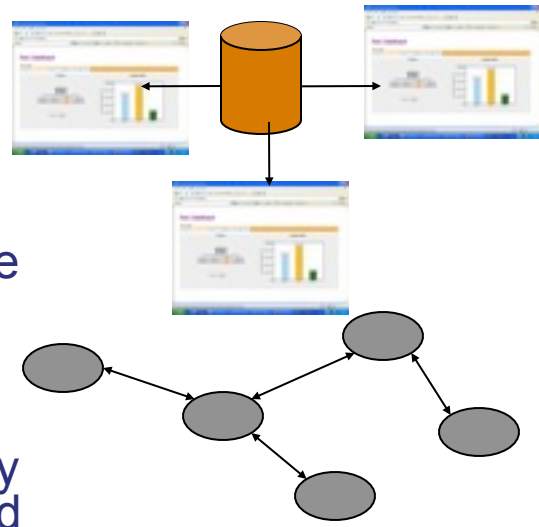
BEA Solution Statement



BEA Solution Statement

Modeling the business capability to be deployed

- **Virtualization:** 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
- **Federation:** 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

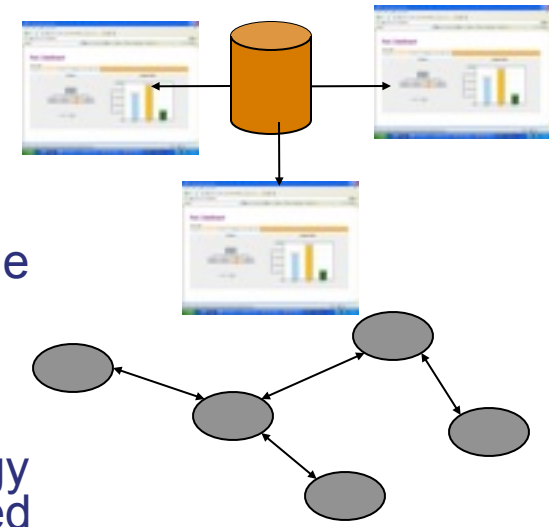




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Interoperability



Interoperability (Federation) in BEA Approach

Modeling the business capability to be deployed

- Federation:

- ✓ The Interstate highway system
- ✓ The railroad system
- ✓ The United States of America
- ✓ DOD is a federation



- Steps

1. Build Domain Vocabularies: describe all of the artifacts in each domain using RDF/OWL standards
 - DoD currently does this description work, but without standards – often in Excel, Word, Powerpoint, Visio, etc
2. Relate Domains: use RDF/OWL based descriptions to say how domains are related
 - This is the big missing piece of the current “standards” approaches
3. Relate domain data to Domain Vocabulary: Use RDF/OWL to say how all of the data in each domain is related to the Domain vocabulary
4. Query the Domain Vocabulary for any information

- Result: BEA Enables Enterprise Information Web



Interoperability (Federation) in BEA Approach

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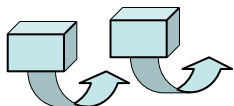


Agility



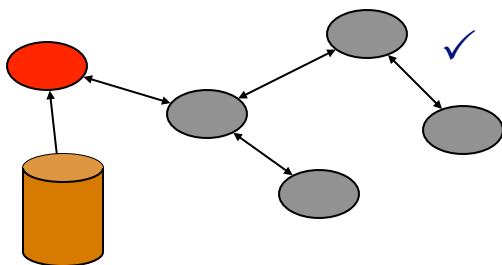
Agility in the BEA Approach

Preparing and populating a modern information model and data store



- Agility in process:
 - ✓ “Agile” development method; quarterly “deliverables”; lessons learned influence next deliverable;

- Agility in product:
 - ✓ Once assets are unambiguously described, whole environment becomes “plug and play”



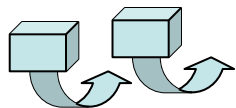
- ✓ Eg: New CIO policy issued:
 - Today: additions/changes to relational environment very costly
 - BEA: RDF/OWL graph-based information model is infinitely extensible and inexpensive to change; just add concept to the graph and point to its authoritative data source (ADS)
- Agility in query development
 - ✓ Queries are machine and human readable
 - ✓ Fast to develop across disparate ADSs

NOTE: up-front time and labor cost of unambiguously describing assets is not trivial



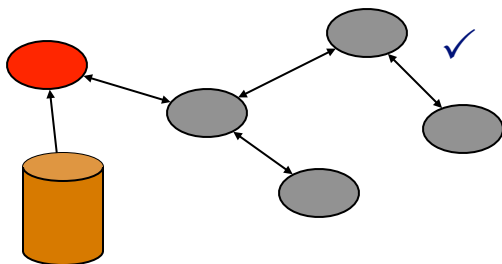
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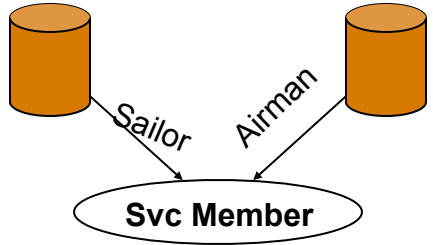
Savings



Example Savings in this BEA Approach

Preparing and populating a modern information model and data store

- Flexibility & Data accuracy
 - ✓ Current “standards” approaches force rigid conformity in understanding and representation of data. Result: very painful and expensive retroactive coding. Semantic approach allows for variation in understanding while prescribing conformity in representation. Result: flexibility at the instance level and accuracy at the enterprise level
- Interface development
 - ✓ E.G.: 5 systems require interfaces to each other (20 interfaces). If each system’s information model is semantically described, only have to describe 5 interfaces
- Portfolio Management
 - ✓ Once information assets are semantically described, Domain vocabulary can assess gaps in the portfolio and the architecture



Data	Concept	System	DV to Arch?
Airma	Svc	Pers	
Soldier	Svc	Pers	
Sailor	Svc	Pers	
Lawye	Svc	Pers	

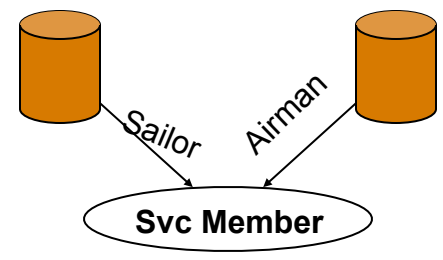
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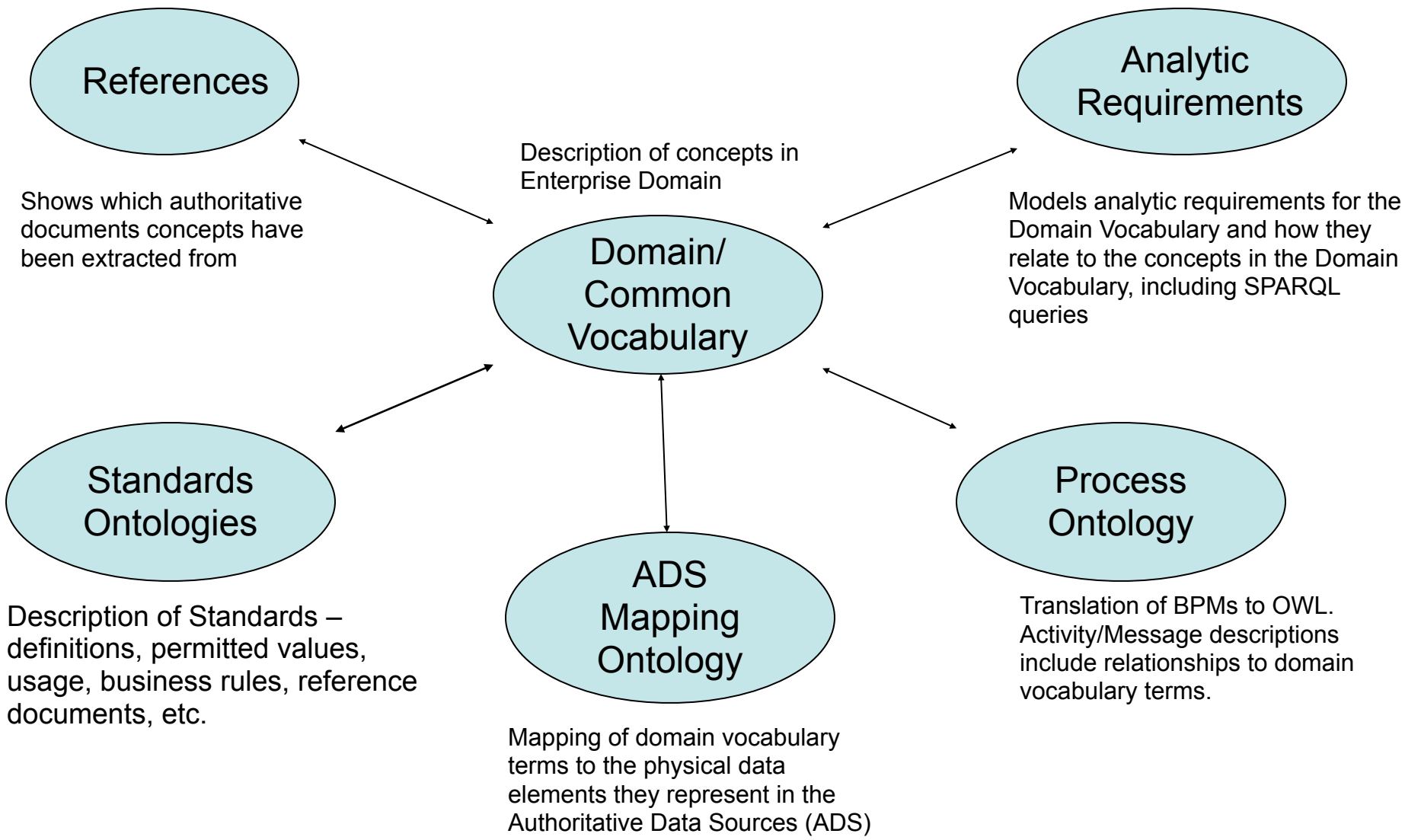
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BEA Ontology



DoD BEA Ontology

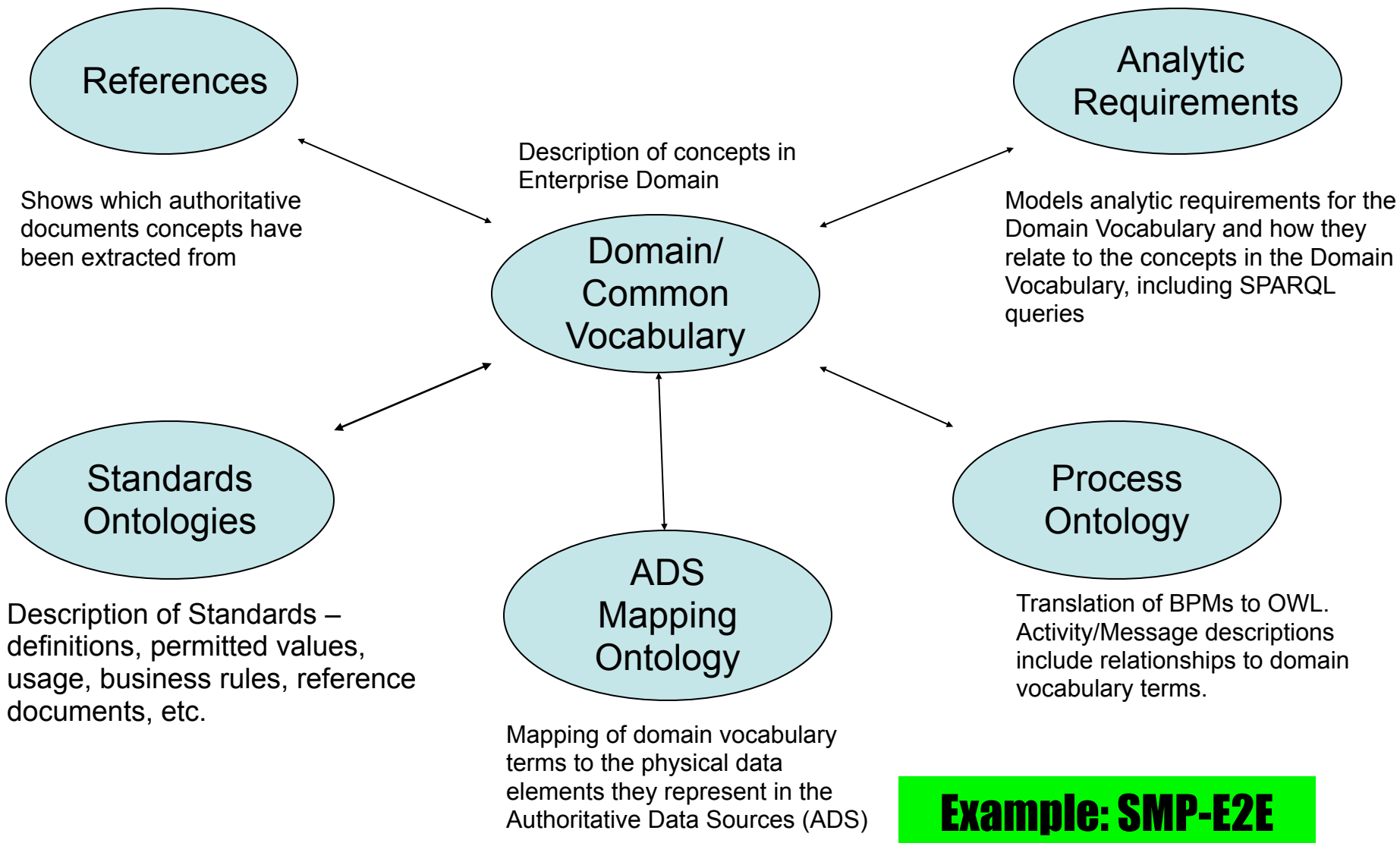
Preparing and populating a modern information model and data store





DoD BEA Ontology

Preparing and populating a modern information model and data store



Example: SMP-E2E

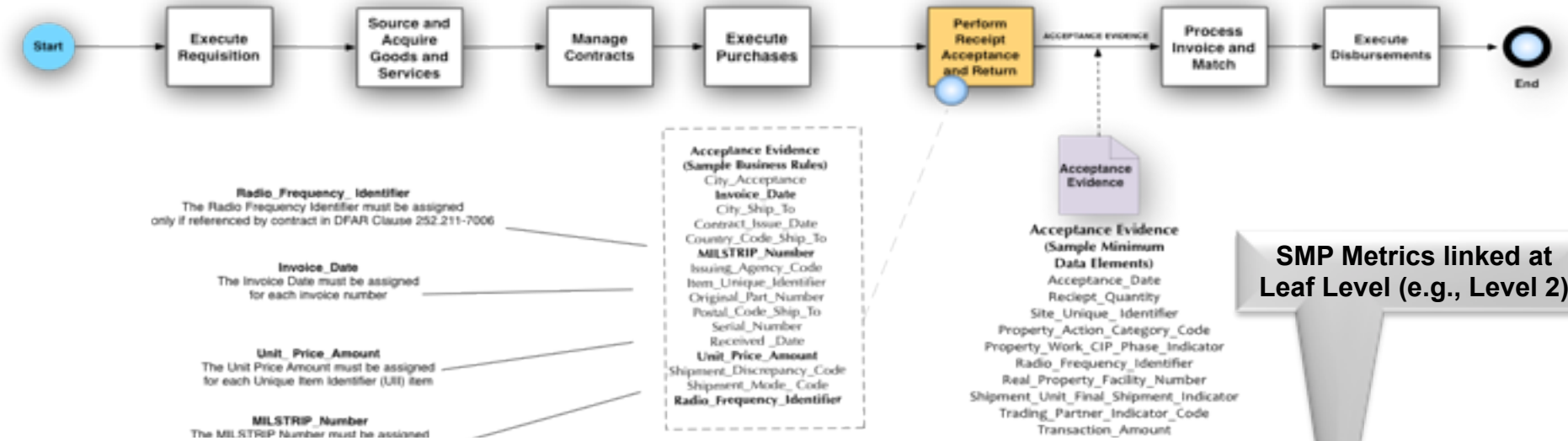
Example SMP to End to End (E2E) Process

Priority 5 – Strengthen DoD Financial Management

Preparing and populating a modern information model and data store

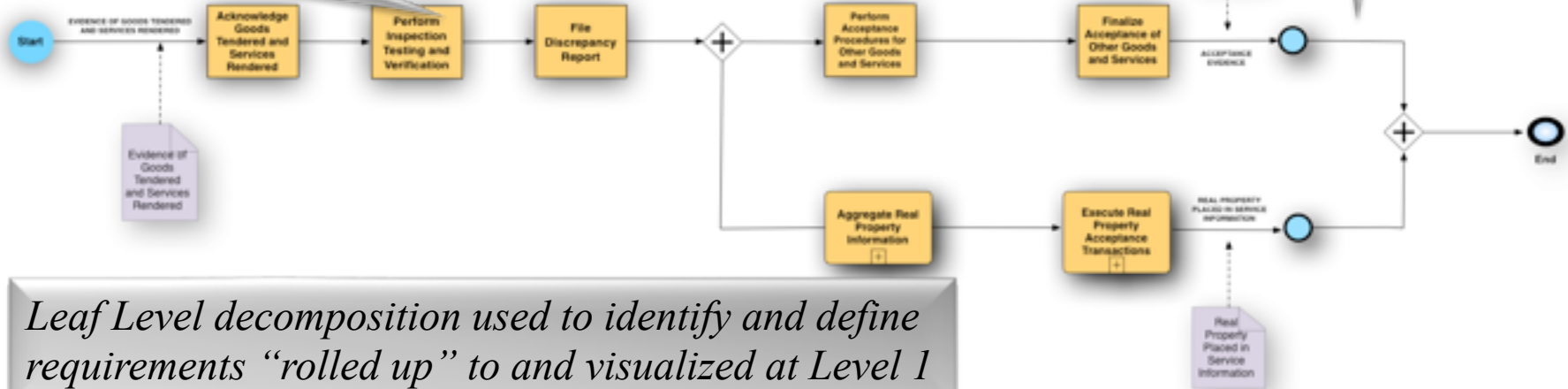
“Procure to Pay” (P2P)
Level 1 E2E in the BEA

SMP Metrics also to be rolled up to Level 1



SMP Metrics linked at Leaf Level (e.g., Level 2)

“Perform Receipt Acceptance & Return” P2P Level 2 E2E in the BEA



Leaf Level decomposition used to identify and define requirements “rolled up” to and visualized at Level 1

Example SMP to End to End (E2E) Process

Priority 5 – Strengthen DoD Financial Management

Preparing and populating a modern information model and data store

“Procure to Pay” (P2P)
Level 1 E2E in the BEA

SMP Metrics also to be rolled up to Level 1



Radio_Frequency_Identifier
The Radio Frequency Identifier must be assigned only if referenced by contract in DFAR Clause 252.211-7006

Invoice_Date
The Invoice Date must be assigned for each invoice number

Unit_Price_Amount
The Unit Price Amount must be assigned for each Unique Item Identifier (UII) item

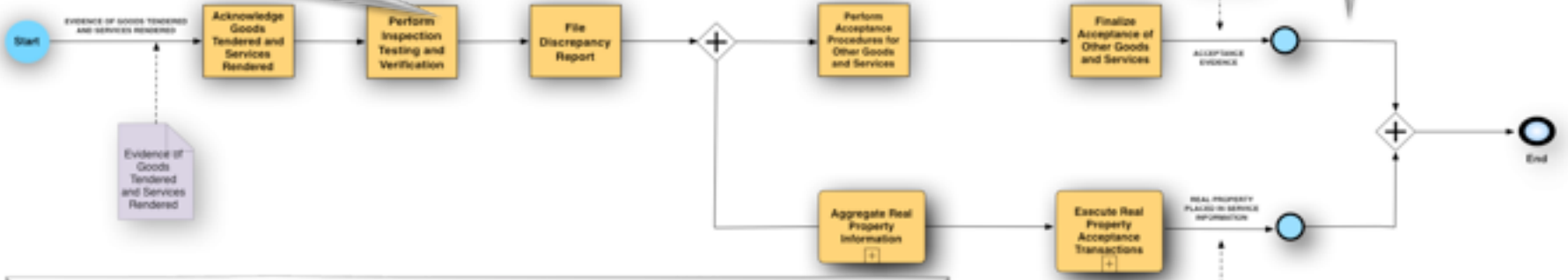
MILSTRIP_Number
The MILSTRIP Number must be assigned

- Acceptance Evidence (Sample Business Rules)
- City_Acceptance
 - Invoice_Date
 - City_Ship_To
 - Contract_Issue_Date
 - Country_Code_Ship_To
 - MILSTRIP_Number
 - Issuing_Agency_Code
 - Item_Unique_Identifier
 - Original_Part_Number
 - Postal_Code_Ship_To
 - Serial_Number
 - Received_Date
 - Unit_Price_Amount
 - Shipment_Discrepancy_Code
 - Shipment_Mode_Code
 - Radio_Frequency_Identifier

- Acceptance Evidence (Sample Minimum Data Elements)
- Acceptance_Date
 - Receipt_Quantity
 - Site_Unique_Identifier
 - Property_Action_Category_Code
 - Property_Work_CIP_Phase_Indicator
 - Radio_Frequency_Identifier
 - Real_Property_Facility_Number
 - Shipment_Unit_Final_Shipment_Indicator
 - Trading_Partner_Indicator_Code
 - Transaction_Amount

SMP Metrics linked at Leaf Level (e.g., Level 2)

“Perform Receipt Acceptance & Return” P2P Level 2 E2E in the BEA



Leaf Level decomposition used to identify requirements “rolled up” to and visualized

Common Vocabulary is Necessary!



Common Vocabulary Development

Preparing and populating a modern information model and data store

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



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



Common Vocabulary Development

Preparing and populating a modern information model and data store

- Identify information to communicate
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“Now! *That* should clear up a few things around here!”



Building Common Vocabularies

Preparing and populating a modern information model and data store

What is the architecture supposed to achieve?

Which processes/activities will provide the capabilities?

Which data/resources will be consumed or produced?

Who/What will be involved?

Define Capabilities

Define Activities

Define Resources

Define Performers

- Items:**
- Objectives
 - Features
 - Services

- Items:**
- Verbs

- Items:**
- Nouns

- Items:**
- Roles
 - Systems
 - Actors



Building Common Vocabularies

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Capability Vocabulary

Activity Vocabulary

Resource Vocabulary

Performer Vocabulary

- Items:
- Objectives
 - Features
 - Services

- Items:
- Verbs

- Items:
- Nouns

- Items:
- Roles
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 - Actors

Capability View

Process View

Data & Rule View

Process View



Building Common Vocabularies

Preparing and populating a modern information model and data store

What is the architecture supposed to achieve?

Which processes/activities will provide the capabilities?

Which data/resources will be consumed or produced?

Who/What will be involved?

Capability Vocabulary

Activity Vocabulary

Resource Vocabulary

Performer Vocabulary

- Items:
- Objectives
 - Features
 - Services

- Items:
- Verbs

- Items:
- Nouns

- Items:
- Roles
 - Systems
 - Actors

Capability View

Process View

Data & Resource View

Performer View

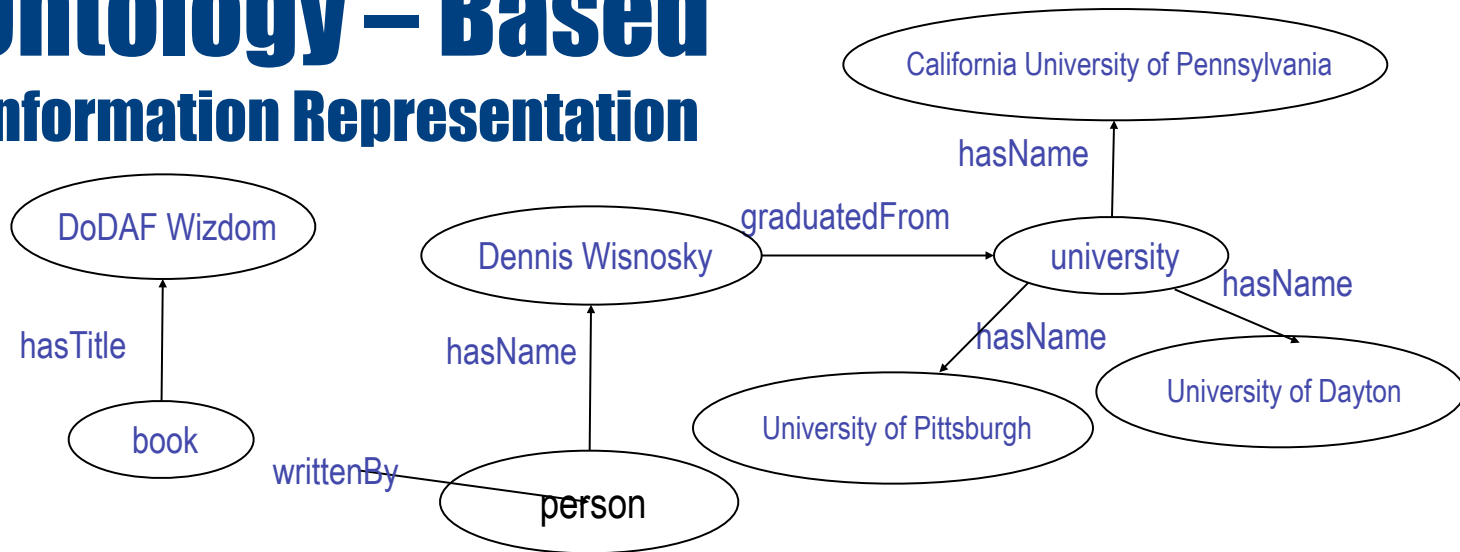
Common Vocabulary in Action!



Ontology – Based Information Representation

DBpedia
(Wikipedia)
Dataset

Graph1

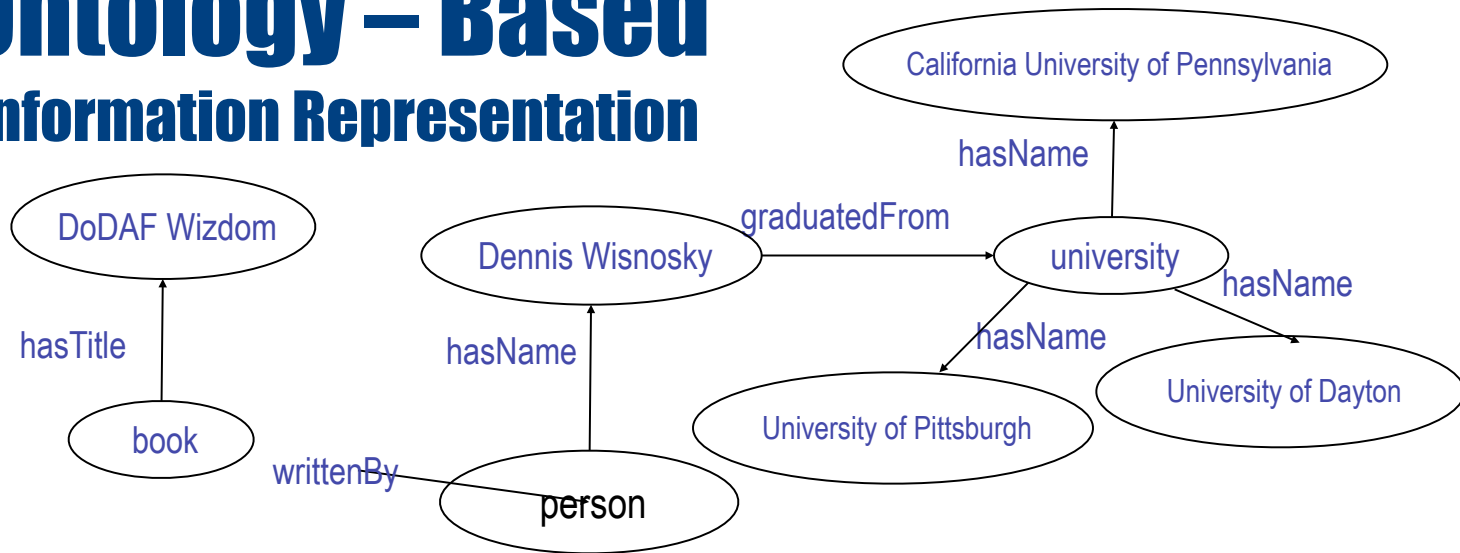




Ontology – Based Information Representation

DBpedia
(Wikipedia)
Dataset

Graph1



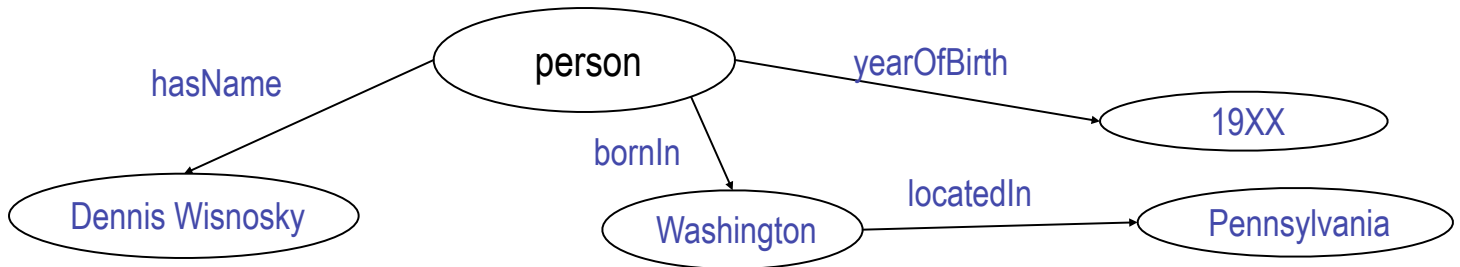
Who wrote “DoDAF Wizdom”?



Ontology – Based Information Representation

Graph2

DoD HR Dataset



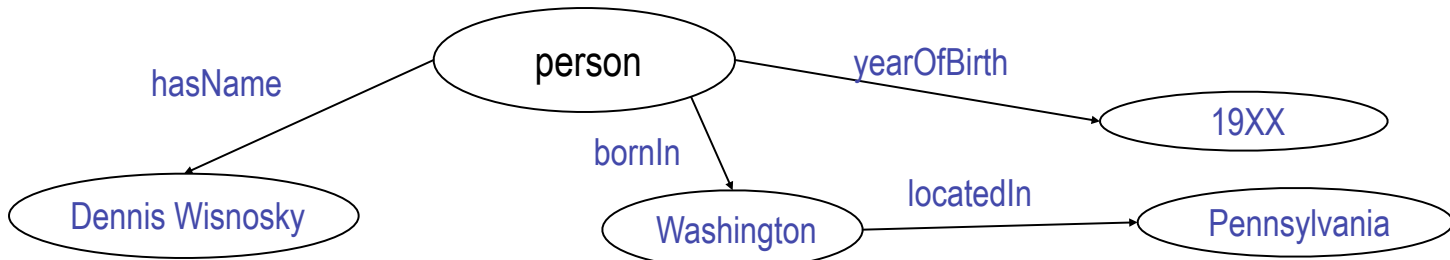


Ontology – Based Information Representation

Where was Dennis Wisnosky born?

Graph2

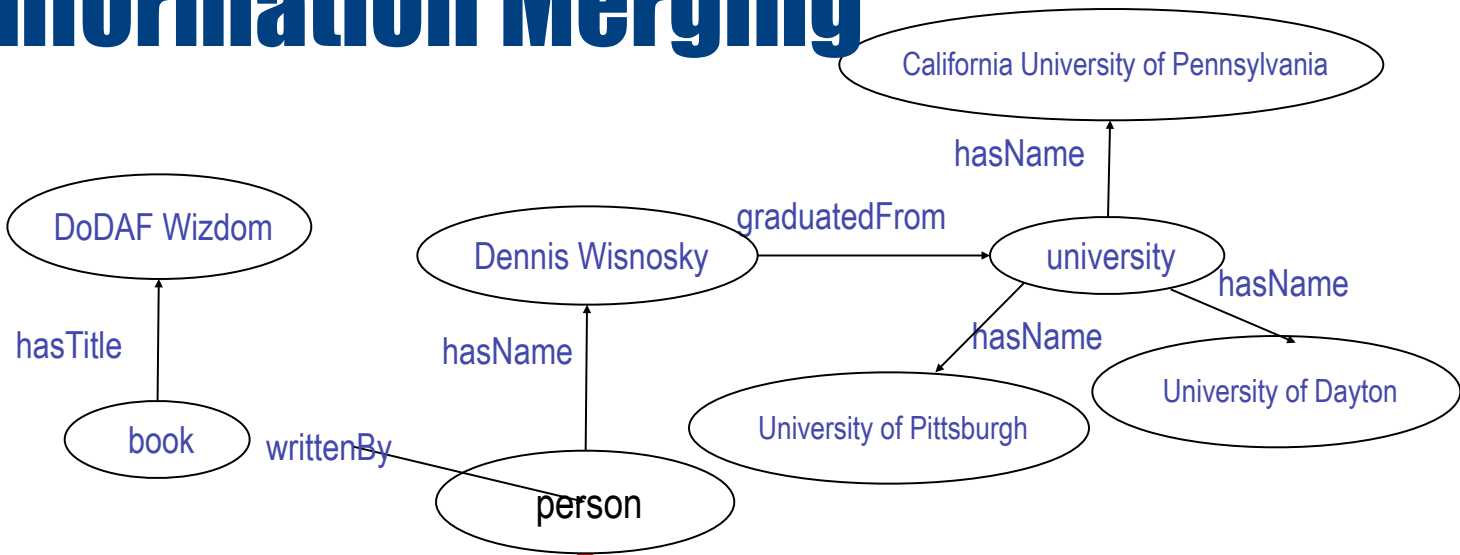
DoD HR
Dataset





Information Merging

DBpedia
(Wikipedia)
Dataset



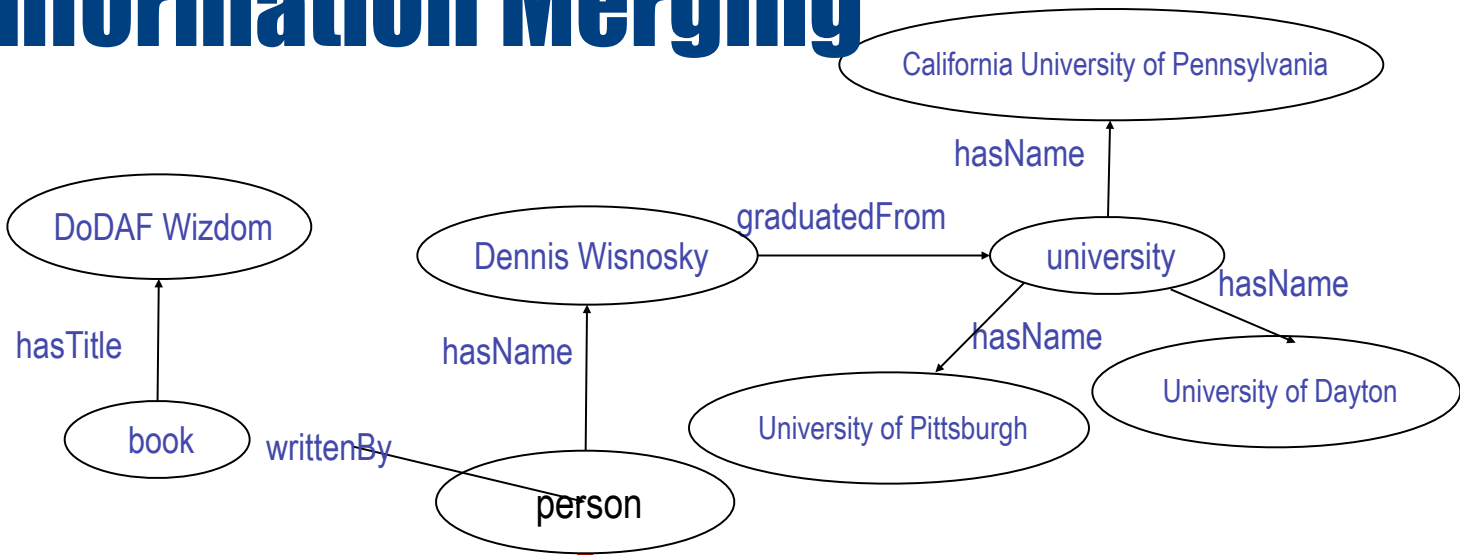
Graph3





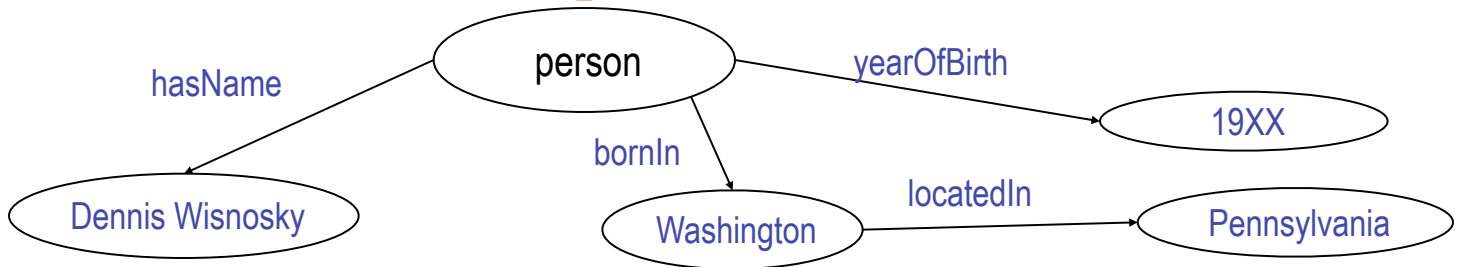
Information Merging

DBpedia
(Wikipedia)
Dataset



Graph3

DoD HR
Dataset

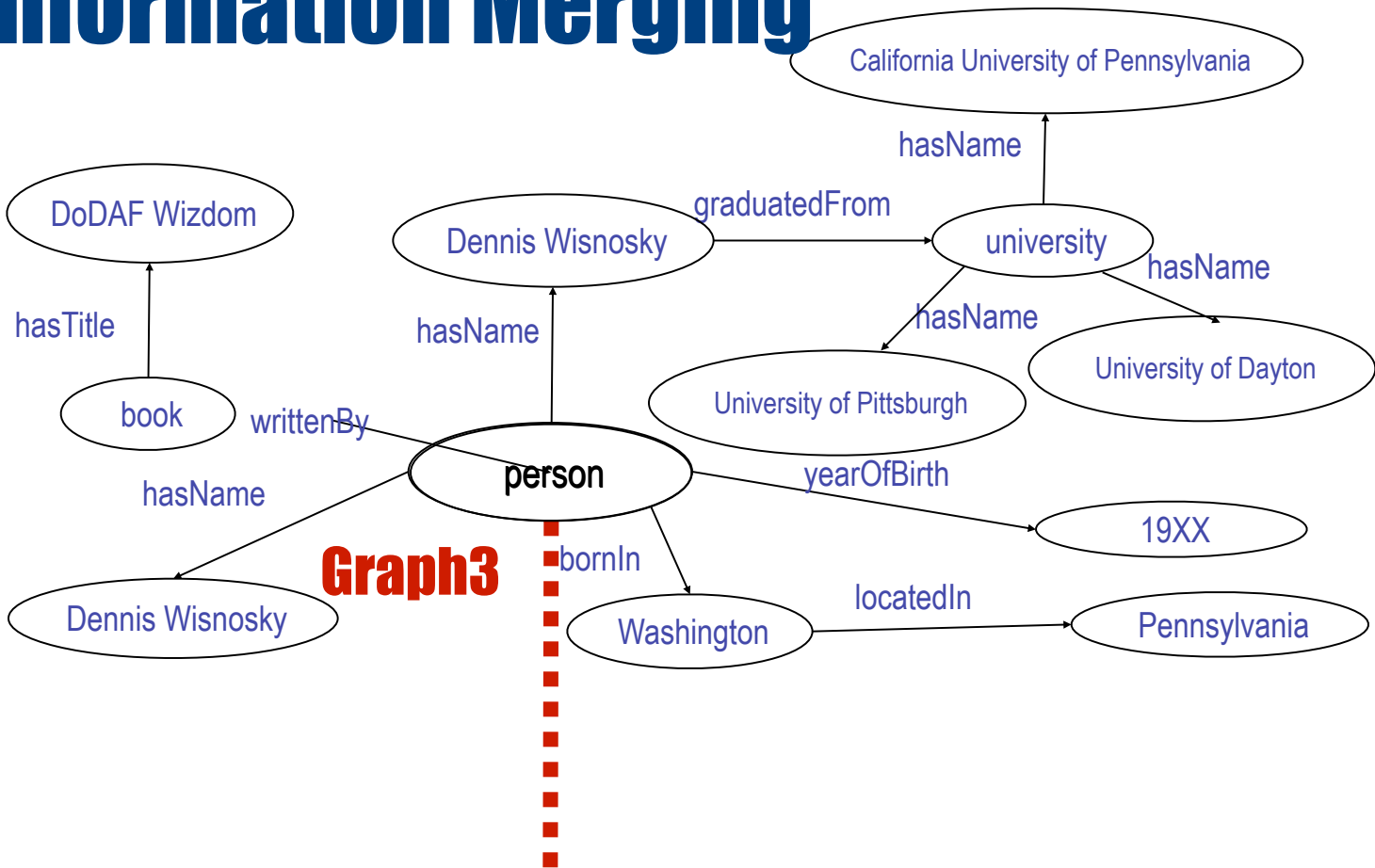




Information Merging

DBpedia
(Wikipedia)
Dataset

DoD HR
Dataset

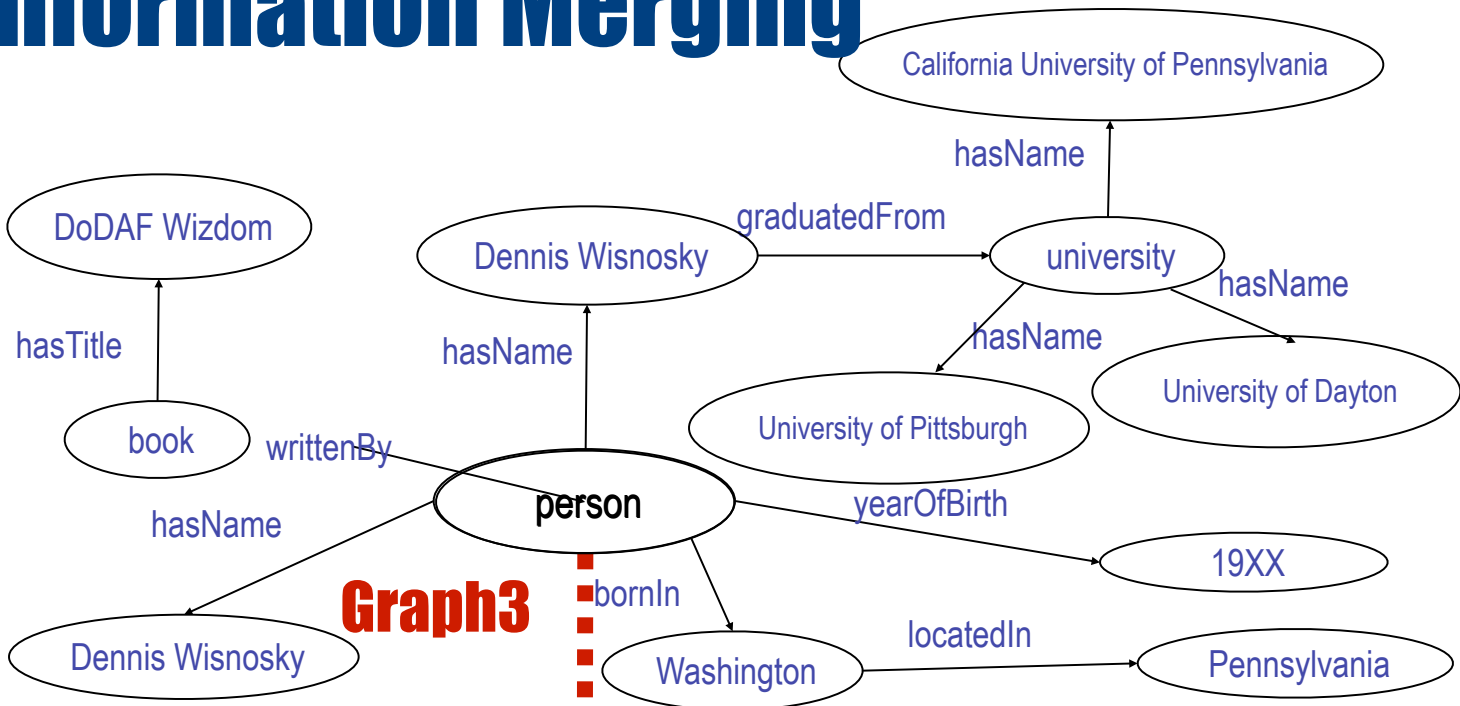




Information Merging

DBpedia
(Wikipedia)
Dataset

DoD HR
Dataset



Graph3

Wikipedia Dataset: Who wrote "DoDAF Wizdom"?

DoD HR Dataset: Where was Dennis Wisnosky born?

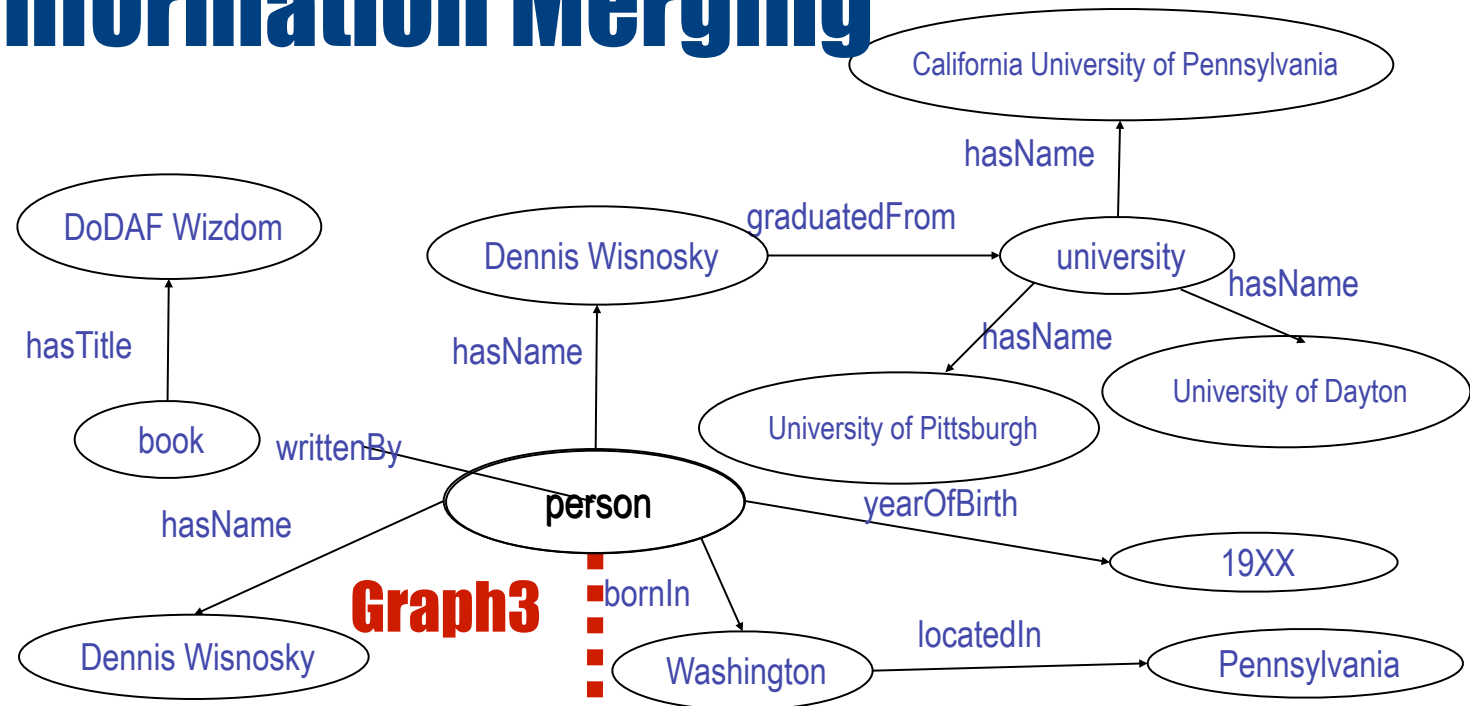
Combined Dataset: Where was the person who wrote DoDAF Wisdom born?



Information Merging

DBpedia
(Wikipedia)
Dataset

DoD HR
Dataset



Graph3

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?

Crawl, Walk, Run - EIW



HR Enterprise Information Web (EIW)

Implementing the capability by deploying business services

- Building an HR Common Vocabulary that will make future integration and development simpler
- Building an executable information model to provide accurate and timely enterprise Personnel Visibility for the first time
- Making “compliance” (eg: SFIS, IRB, BEA) exercises simpler, faster, meaningful, easier to maintain



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EIW Roadmap



UR Domain Ontology

Implementing the capability by deploying business services

- Information discovery, interoperation, and integration all depend on description
 - If we do not *know* what something is we cannot possibly know how to integrate it with other things or even how it should be used
- If we describe everything, we are in a position to have a knowledge-based web
 - Rich analytics
 - Requirements gap analysis
 - Authoritative Data Source discovery
 - Answer any Personnel & Pay question
 - Integrate and interoperate



HR Domain Ontology

Implementing the capability by deploying business services

- Information discovery, interoperation, and integration all depend on description
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BPM Informs Ontology

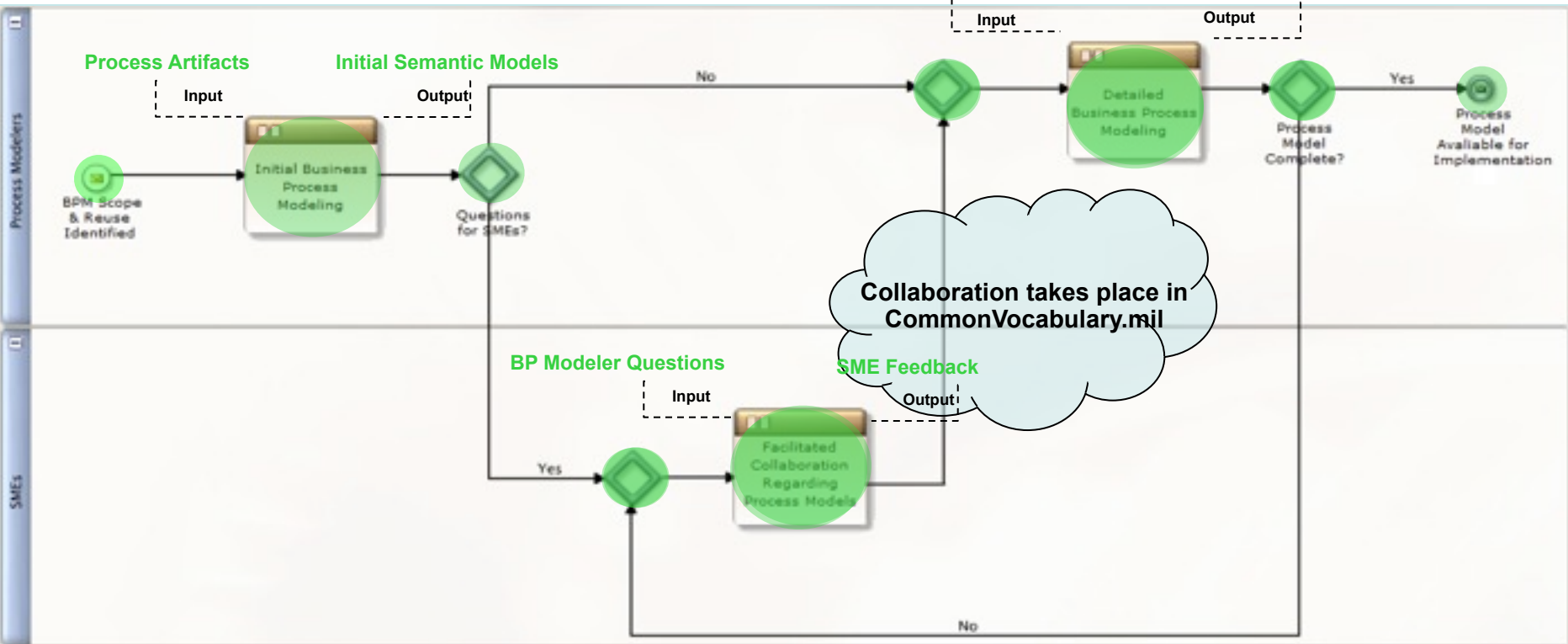


Implementing the capability by deploying business services

BPM Methodology

Goal: Develop correct, consistent, human and machine readable, high quality business process models

Approach:



Benefits:

- Consistent, semantically aligned (end- to-end HR) business processes
 - Communicate effectively with the Services

- Machine readable (queryable) business processes
 - Perform gap analysis
- Standards based models result in fewer errors during implementation

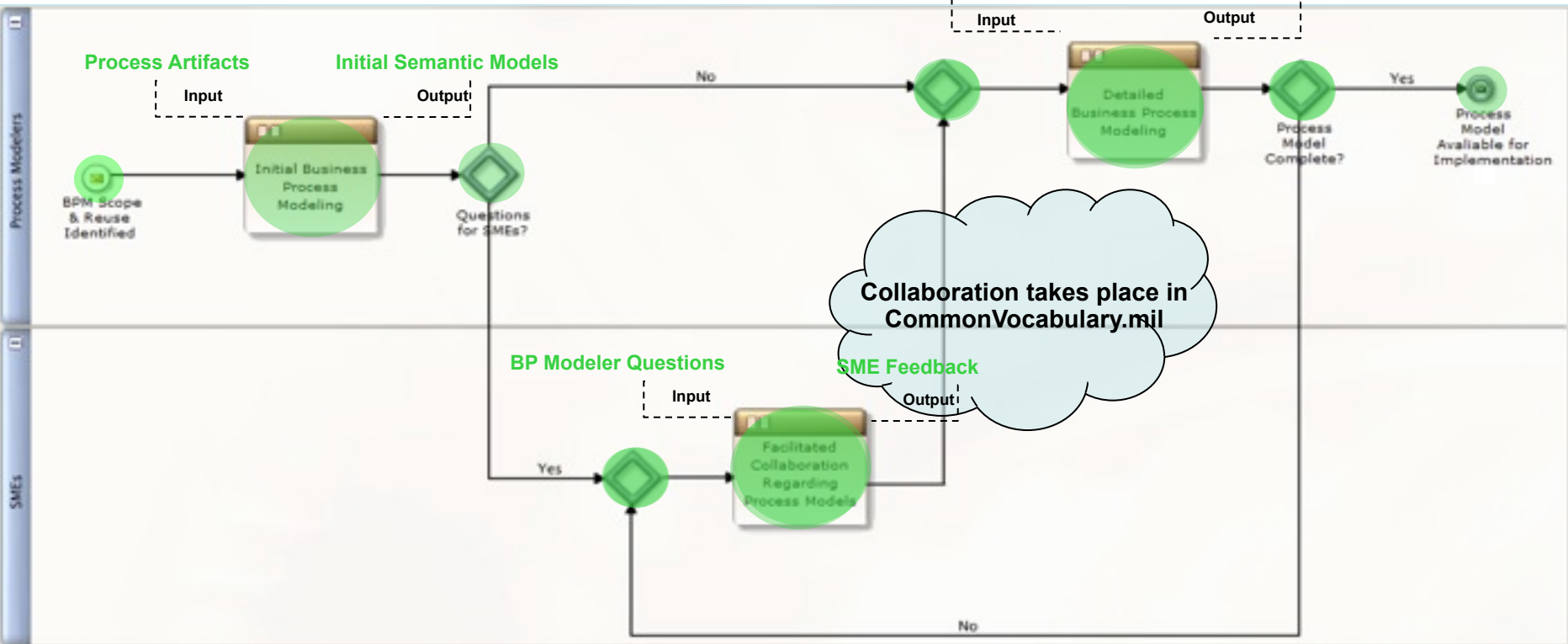


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Collaboration



Community Workspace: www.CommonVocabulary.army.mil

https://www.commonvocabulary.army.mil/ui/groups/HR_EIW

Implementing the capability by deploying business services

CommonVocabulary - Human Resources - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Print Preview

Address: https://www.commonvocabulary.army.mil/ui/groups/HR_EIW/vocab/Human_Resources

Google Search Sidewiki Check Translate AutoFill Sign In

CommonVocabulary My account Community File Edit RSS Feeds

Find: search this vocabulary Search ehtambo6 Log out

Human Resources

Community HR_EIW vocabulary Human_Resources

Classes Properties

- (Acc... Cas)
 - Accumulator
 - AdditionalProperty [d2rq]
 - Address
 - AgreementType
 - Allotment
 - AllotmentDesignee
 - AllowedValuesClasses
 - Application
 - Application_Status
 - Application_Type
 - Attachment
 - BankAccount
 - CasualtyAssistancePackage
 - CasualtyIncidentHostilityType
 - CasualtyInvestigationRequirement
 - CasualtyReport
 - CasualtySituationNotificationType
- (D2R... Men)
 -

View Graph RDF Discussion History

Contents

- 1 Technical Specifications
- 1.2 Overview

Technical Specifications

Overview

Ontology Name
http://www.knoodl.com/ui/groups/DIMHRS/vocab/Human_Resources/

Dependencies

Namespaces

- d2rq: <http://www.wiiss.fu-berlin.de/suhl/bizer/D2RQ/0.1#>
- d2rq-ext: http://www.knoodl.com/group/DIMHRS/vocab/D2RQ_Vocabulary#
- dc: <http://purl.org/dc/elements/1.1/>
- ja: <http://jena.hpl.hp.com/2005/11/Assembler#>
- nsf: http://www.knoodl.com/ui/groups/DIMHRS/vocab/Human_Resources/



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CommonVocabulary My account Community File Edit RSS Feeds

Find: Search ehtambo6 Log out

Human Resources

Community HR_EIW vocabulary Human_Resources

Classes Properties

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- d2rq-ext: <http://www.knoodl.com/group/DIMHRS/vocab/D2RQ-EXT/>
- dc: <http://purl.org/dc/elements/1.1/>
- ja: <http://jena.hpl.hp.com/2005/11/Assembler#>
- nsf: http://www.knoodl.com/ui/groups/DIMHRS/vocab/Human_Resources/

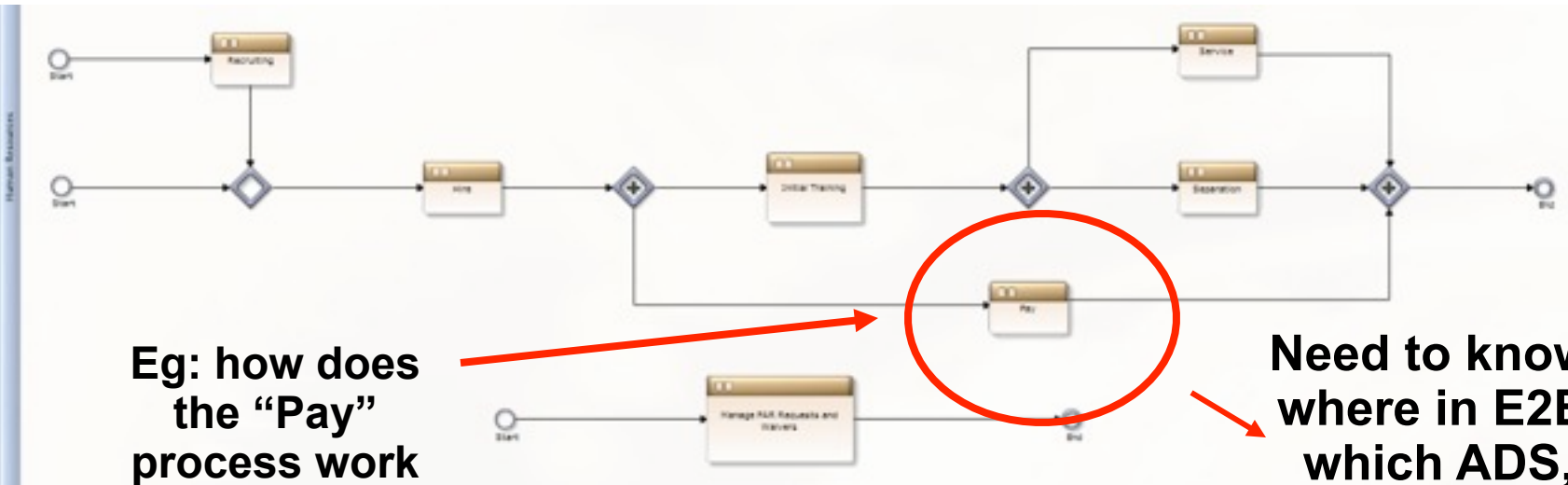
HR EIW & H2R E2E



HR EIW and H2R E2E

Implementing the capability by deploying business services

Personnel Visibility not possible if DoD doesn't understand the Enterprise H2R E2E processes, information flows, data sources, integration points, standards and exceptions



Eg: how does the "Pay" process work across DoD in the E2E?

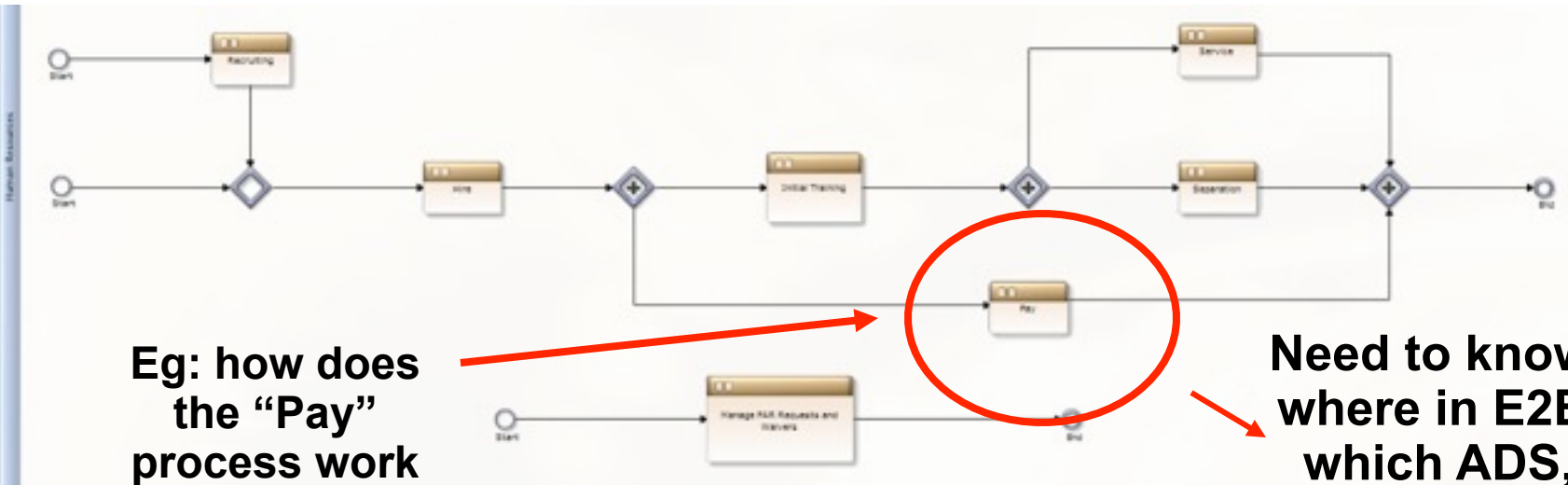
Need to know: where in E2E, which ADS, semantics (meaning) of data, and access



HR EIW and H2R E2E

Implementing the capability by deploying business services

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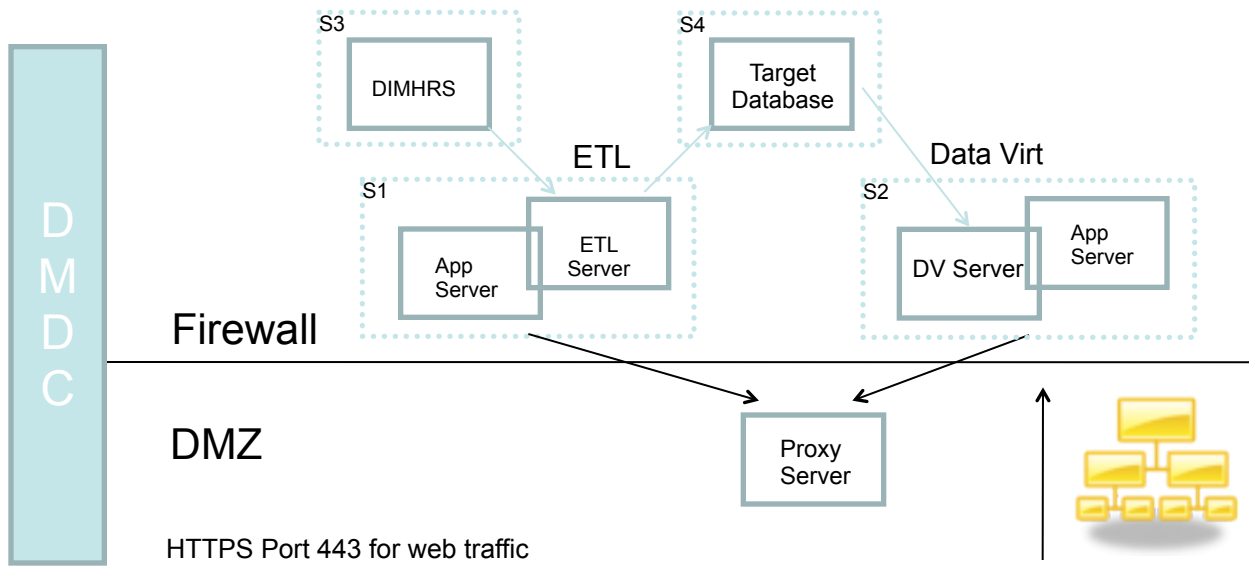
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90 Day Deliverables – POD 1



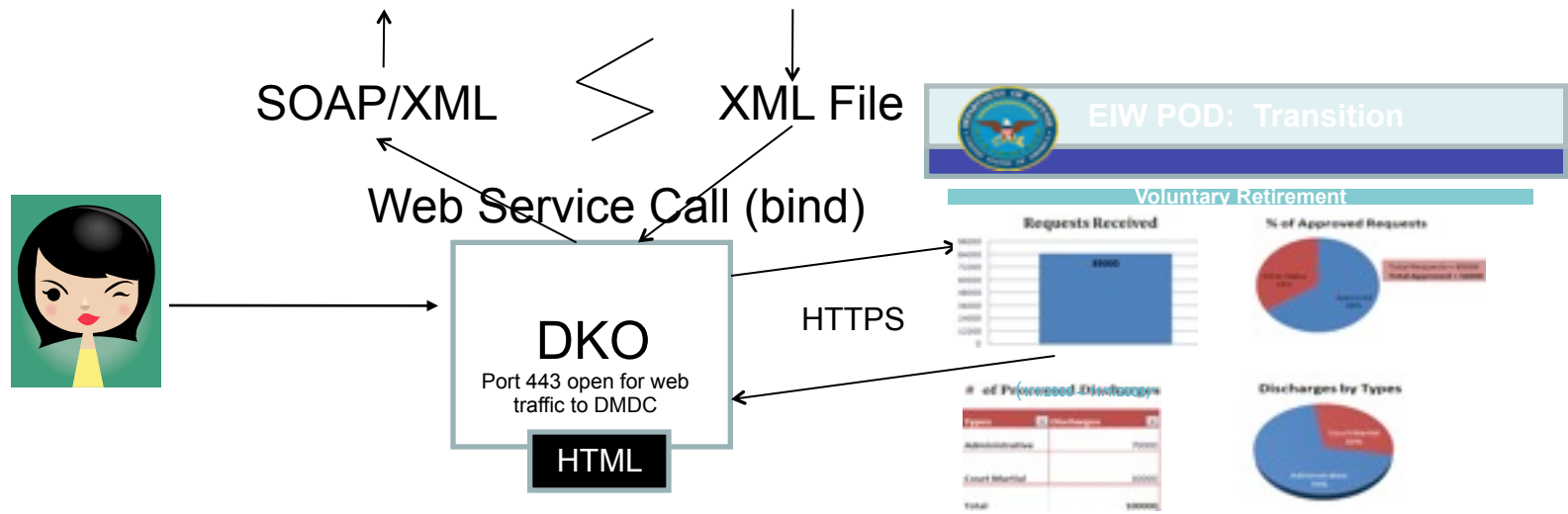
Implementing the capability by deploying business services

Backend PoD1 Architecture



- Objectives Achieved:
- ✓ Web Service
 - ✓ DKO CAC Authentication
 - ✓ Data Virtualization
 - ✓ ETL Process
 - ✓ DMDC MOU
 - ✓ P&R HR Ontology Models
 - ✓ DIMHRS Reuse

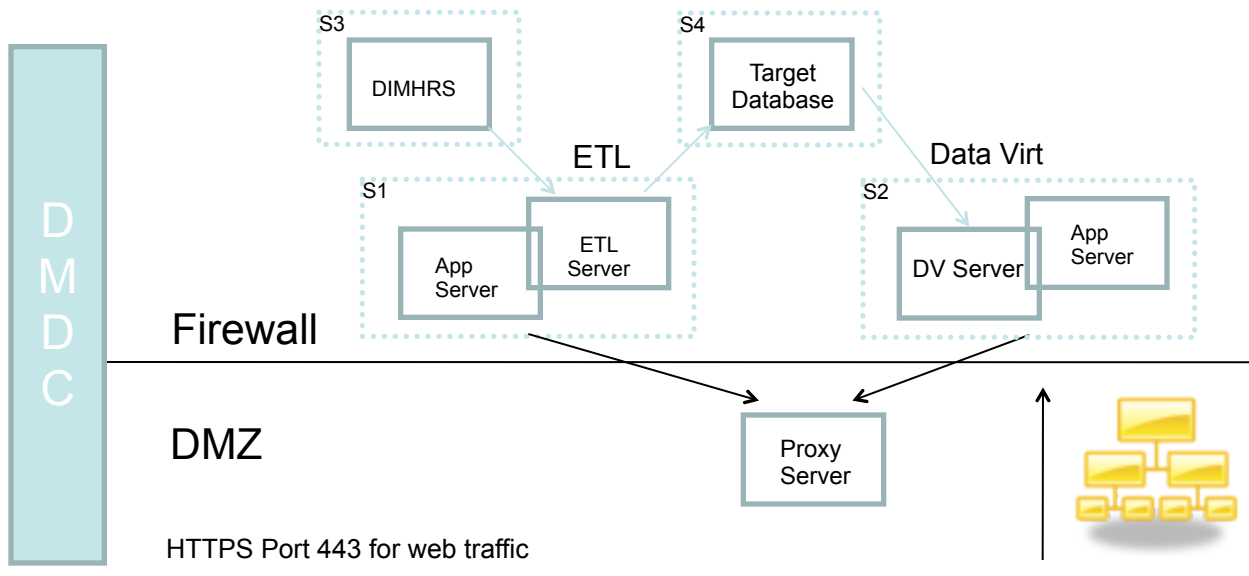
HTTPS Port 443 for web traffic



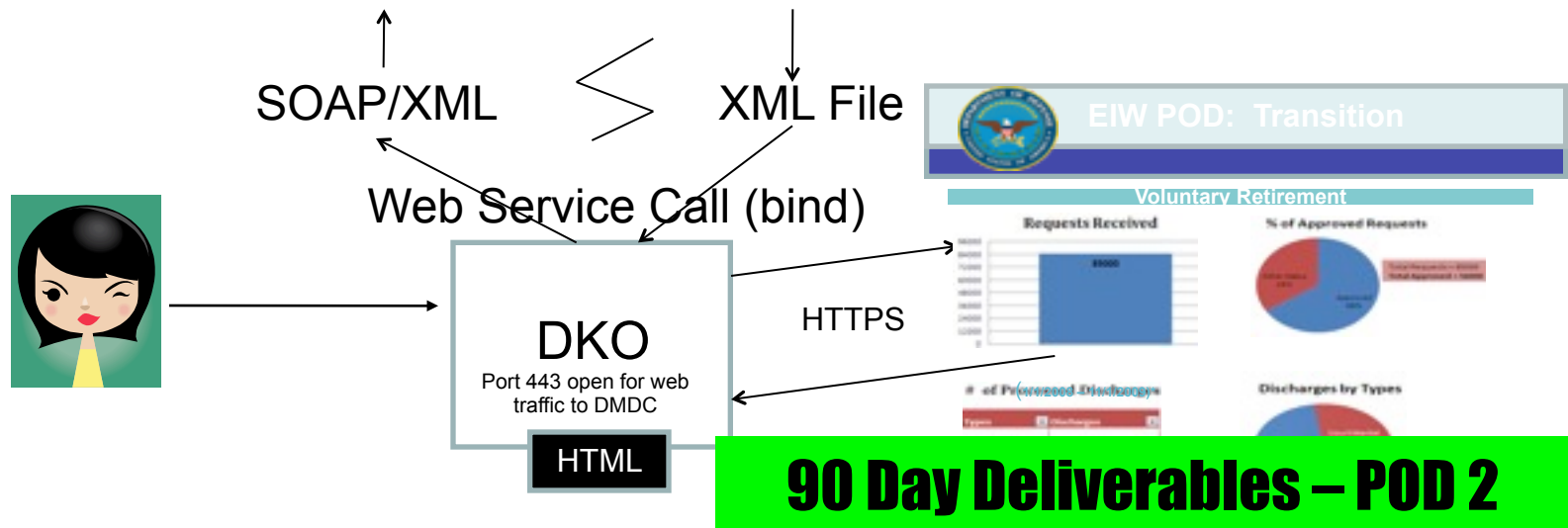


Implementing the capability by deploying business services

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90 Day Deliverables – POD 2



RDF Warehouse Architecture (POD2)

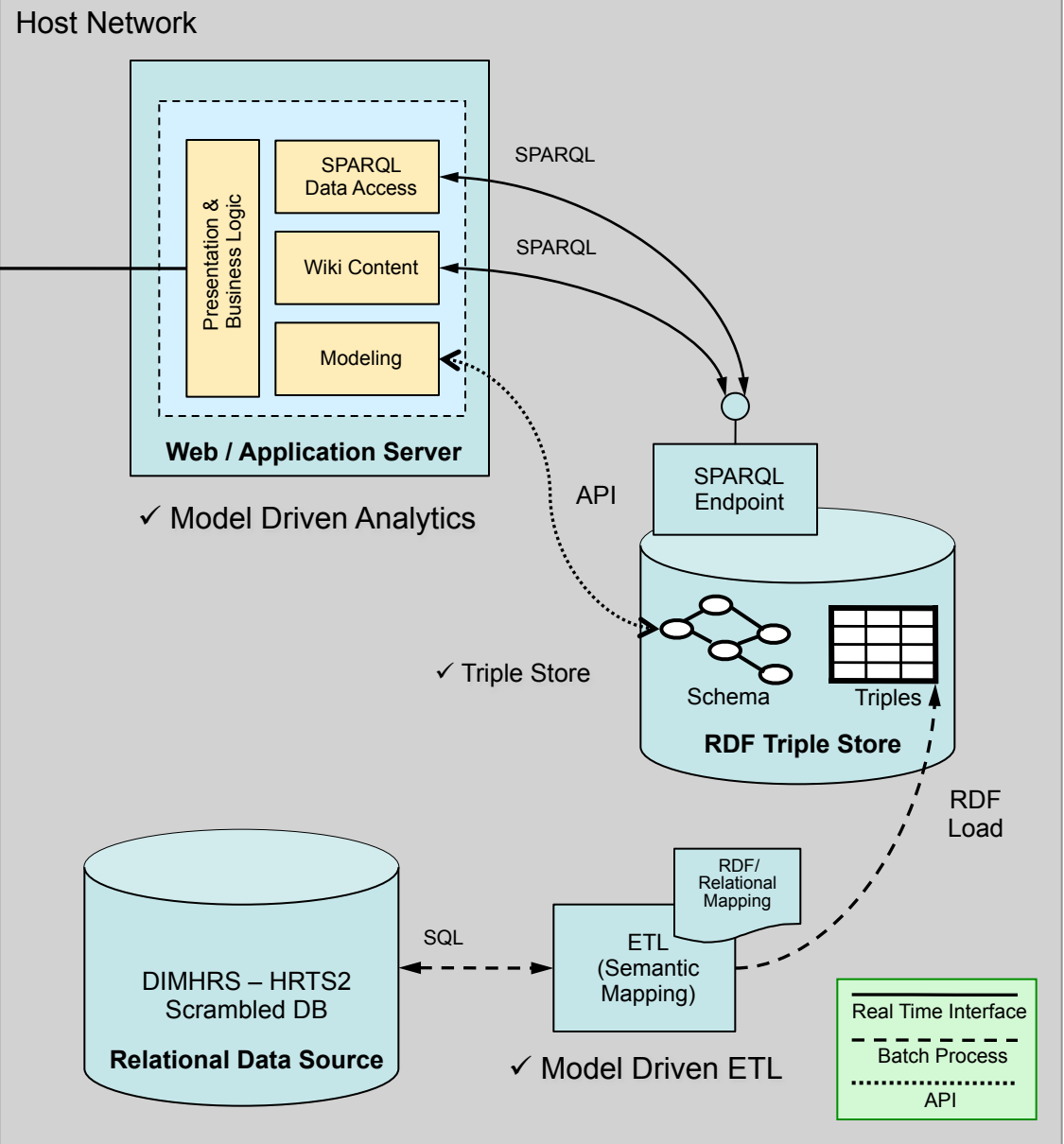
NIPRNet / Internet Host Network

Implementing the capability by deploying business services



HTTPS

User Agent (Web Browser)





RDF Warehouse Architecture (POD2)

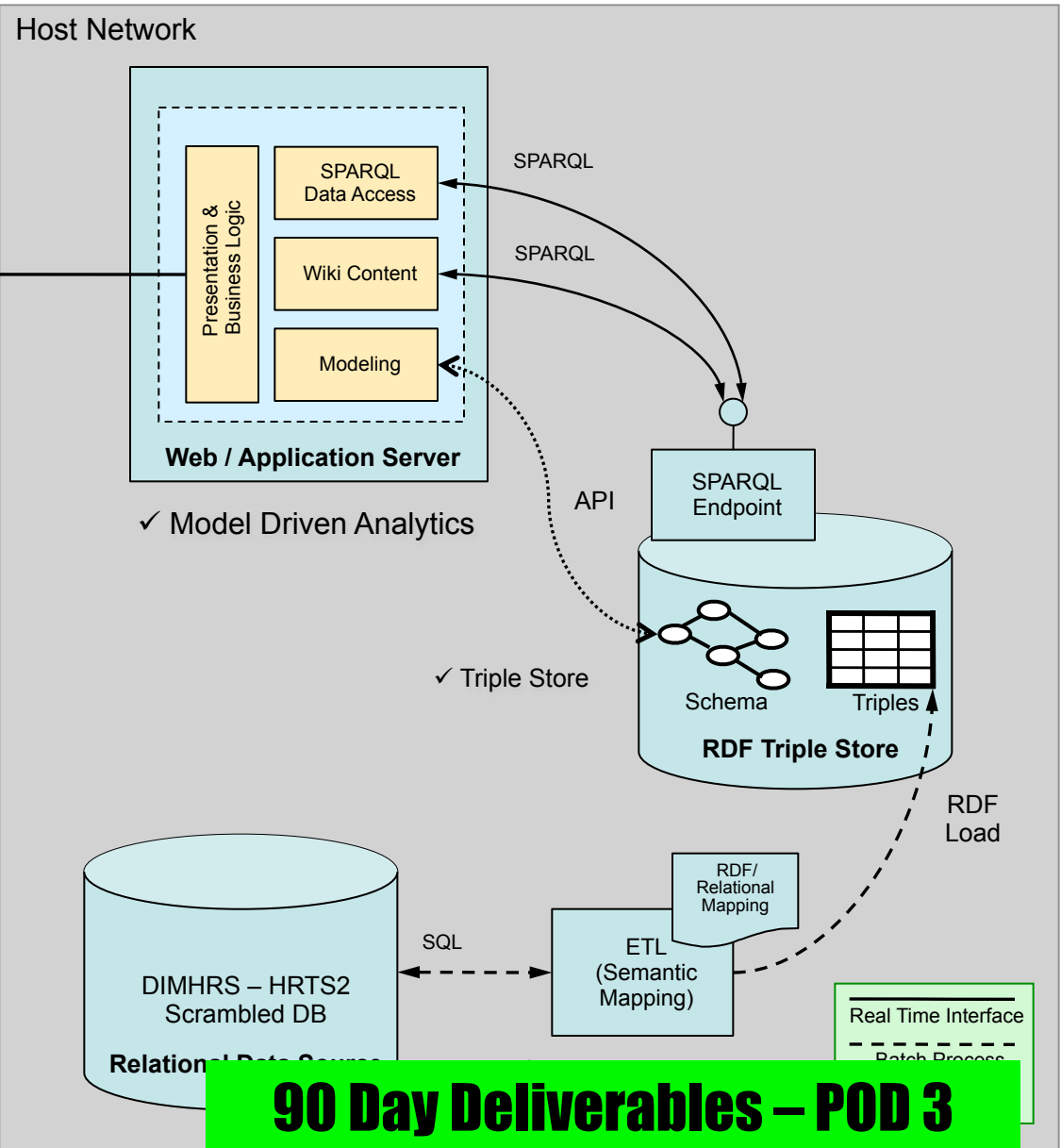
NIPRNet / Internet Host Network

Implementing the capability by deploying business services



HTTPS

User Agent (Web Browser)



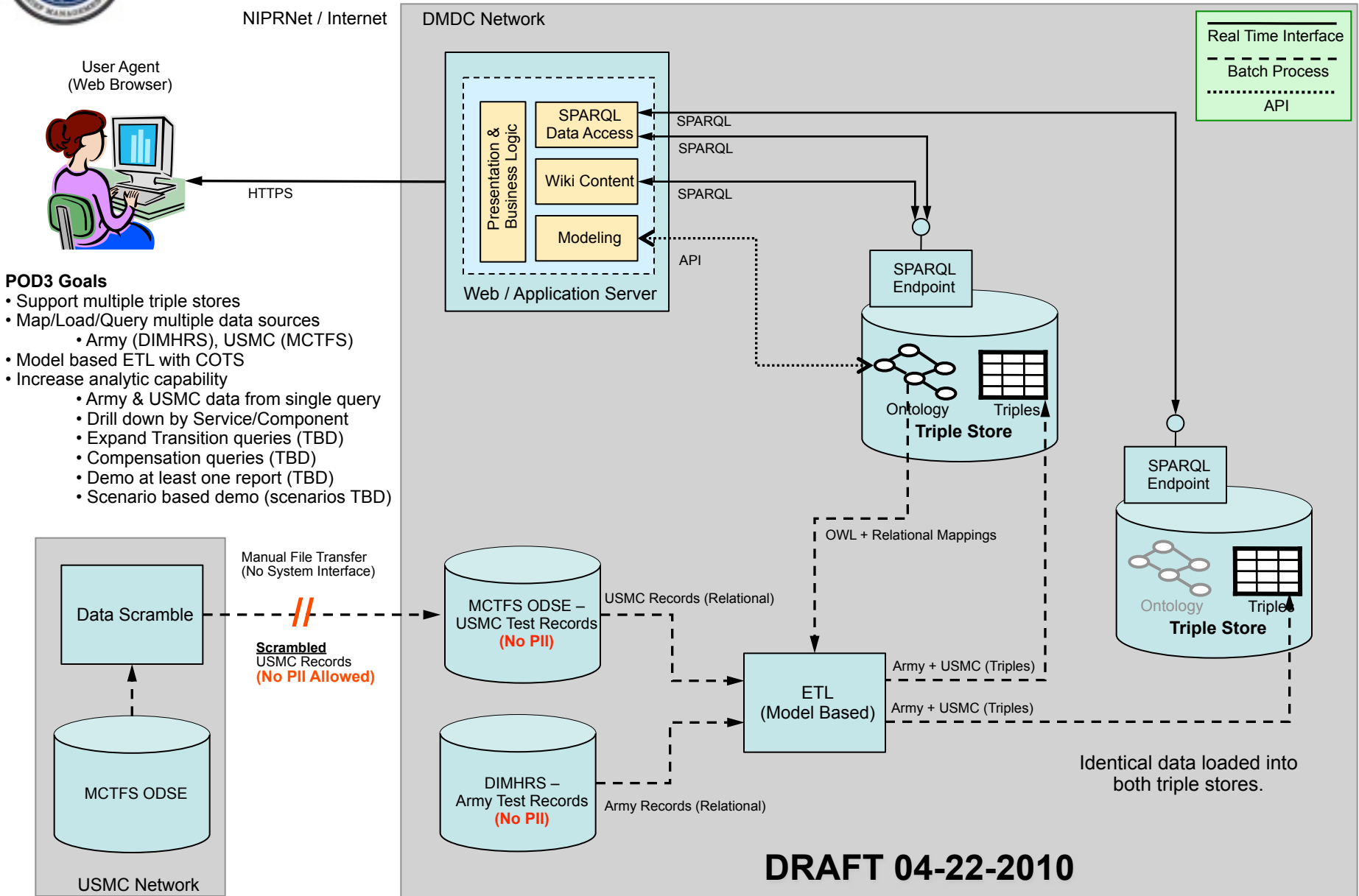
90 Day Deliverables – POD 3

Real Time Interface
Batch Process



Implementing the capability by deploying business services

RDF Web Extensibility (POD3)



- POD3 Goals**
- Support multiple triple stores
 - Map/Load/Query multiple data sources
 - Army (DIMHRS), USMC (MCTFS)
 - Model based ETL with COTS
 - Increase analytic capability
 - Army & USMC data from single query
 - Drill down by Service/Component
 - Expand Transition queries (TBD)
 - Compensation queries (TBD)
 - Demo at least one report (TBD)
 - Scenario based demo (scenarios TBD)

DRAFT 04-22-2010



Implementing the capability by deploying business services

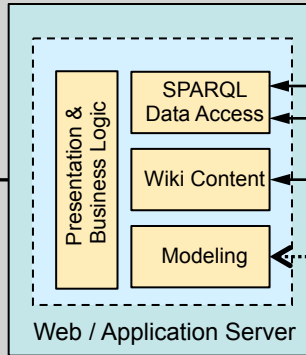
RDF Web Extensibility (POD3)

NIPRNet / Internet

DMDC Network



HTTPS

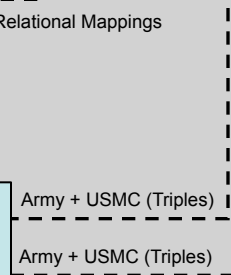
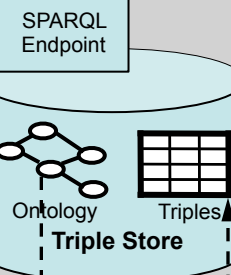


SPARQL

SPARQL

SPARQL

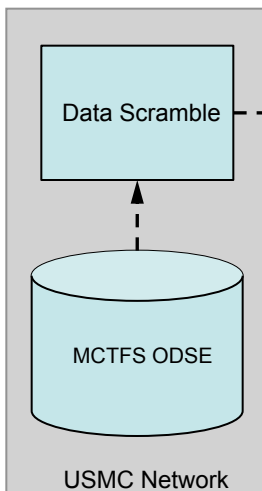
API



Real Time Interface

 Batch Process
 - - -
 API

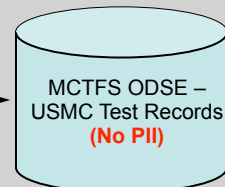
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Manual File Transfer (No System Interface)

//

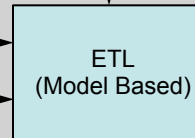
Scrambled USMC Records (No PII Allowed)



USMC Records (Relational)



Army Records (Relational)



Army + USMC (Triples)

Army + USMC (Triples)

OWL + Relational Mappings

Identical data loaded into both triple stores.

Use Case!

DRAFT 04-22-20



Operations – Country View: User Defined Query

Pod 3 Dashboard

Map | Compensation | Separation | **MOC 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

SON	First Name	Last Name	Loc.	Rank	Primary MOS	Unit
664887701	CukyoGht1	FajouJest	51	RAJ	W05190	NORTHCOM
1040794003	qptpouL2	ciWsm00s	06	1750T	W058999	NORTHCOM
286014898	TjyRhc1rv	FskTdsG20s	06	5CT	W05321	NORTHCOM
2886402741	Wxzu1K32g	cfWsm70ss	08	LTCOL	W05202	NORTHCOM
240226098	KcVv5Fhqt1	ksWMCeTpi	51	5CT	W052821	NORTHCOM
2764415340	VfyahPtyC	WsmcLQph	95	5CT	W052671	PACOM
2295227019	qitDnc4K0p	lPGBhvGv	51	CPL	W054641	NORTHCOM
2213602753	SichCydHr	sdhonzFvr	95	5CT	W05341	PACOM
350157891	TbqghWsk	W05hs2P0k	51	5CT	W05431	NORTHCOM
613173406	XDpndElyp	qzDpshMy	12	LTCOL	W05302	CENTCOM
2802128436	saTKGmsb	SPkqumrF	51	0150T	W056276	NORTHCOM
				Total		Members:30

Dialog

About



Operations – Country View: User Defined Query

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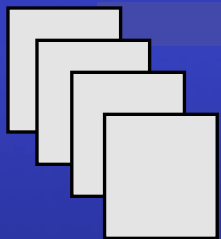
SON	First Name	Last Name	Loc.	Rank	Primary MOS	Unit
444887701	CukyoGht1	FajouJest	51	MAJ	W05190	NORTHCOM
1040794003	qptpou2	ciWsm07s	06	1STGT	W058999	NORTHCOM
286014826	TjyRd1rv	FskTds20s	06	SGT	W05031	NORTHCOM
288602741	XiazuX32g	cfWsm70s	08	LTCOL	W05022	NORTHCOM
240226708	KcVvSpht1	kbWmCst1p	51	SGT	W052831	NORTHCOM
276445340	VfyRht1c	MhwrCJq6	85	SGT	W052671	PACOM
2295227019	qptDsc4K0p	lPGBsvq2	51	CPL	W054841	NORTHCOM
221362753	SichuCy4H	sdhonzF1r	85	SGT	W05041	PACOM
350157891	TbqRht4k	W05hs2P0k	51	SGT	W05431	NORTHCOM
412173404	XDpndE1p	qptDsc4K0p	12	LTCOL	W05002	CENTCOM
280212843	saTKGms	SPkqum1F	51	O1SGT	W05627s	NORTHCOM
				Total		Members:20

**Interoperability through:
Model – Data – Implement!**



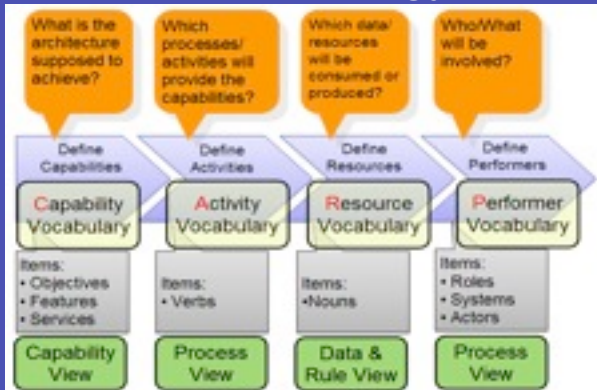
Interoperability through "Model-Data-Implement"

Governance



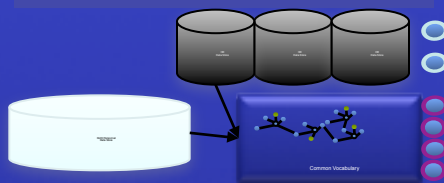
Policy, Processes & Tiered Accountability

Common Architecture Methodology



Common Vocabulary

Authoritative Data Sources



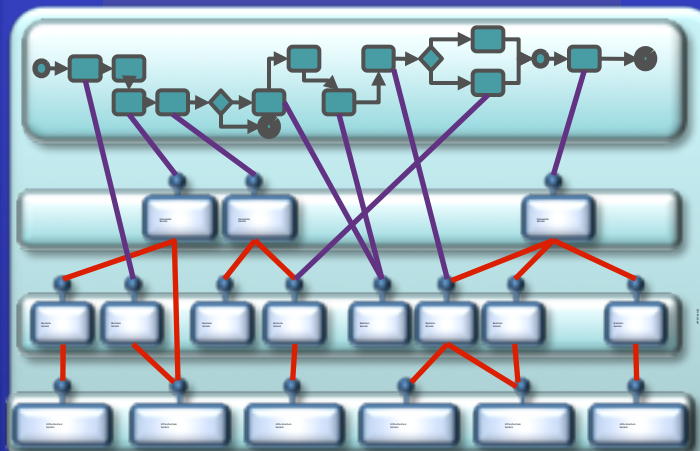
Component Data Stores



External Data Services

Semantic Technologies

Phased Implementations



End-to-End Processes

Agile Business Services Delivery

Standard Representation and Composition



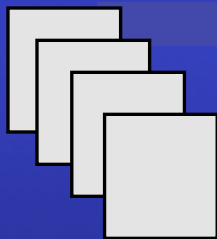
Primitives & Design Patterns





Interoperability through "Model-Data-Implement"

Governance



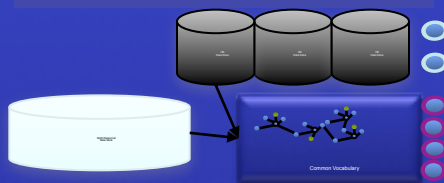
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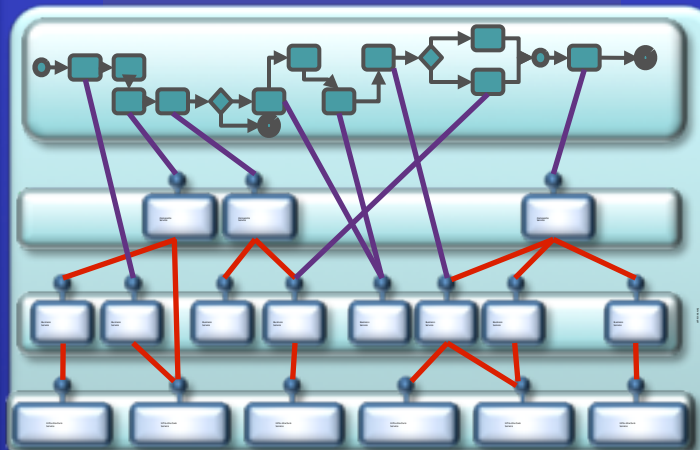
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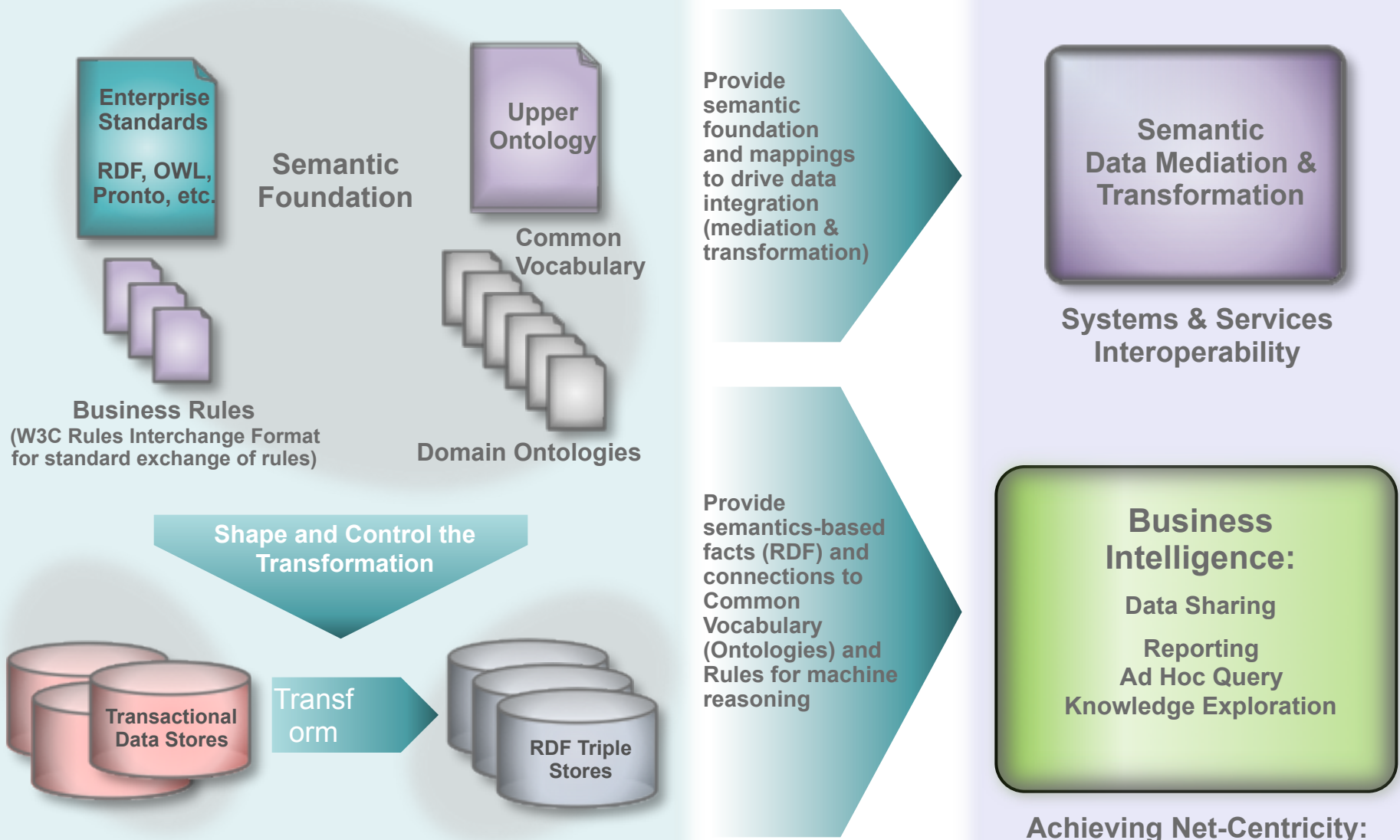
Primitives & Design Patterns

DoD Semantic Landscape





DoD Business Operations Semantic Landscape

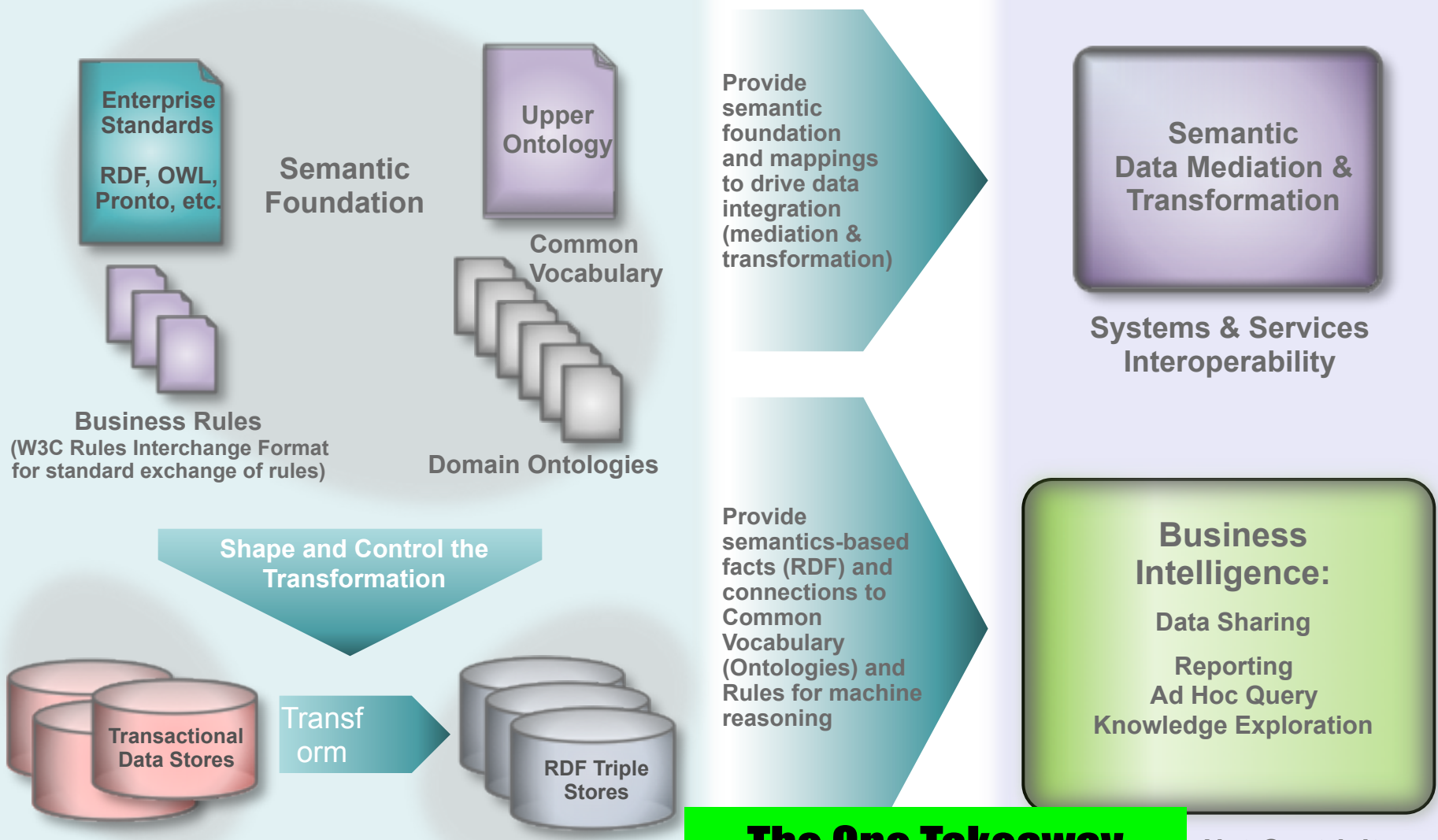


EIW is first BI realization of this

Achieving Net-Centricity:
Data Sharing



DoD Business Operations Semantic Landscape



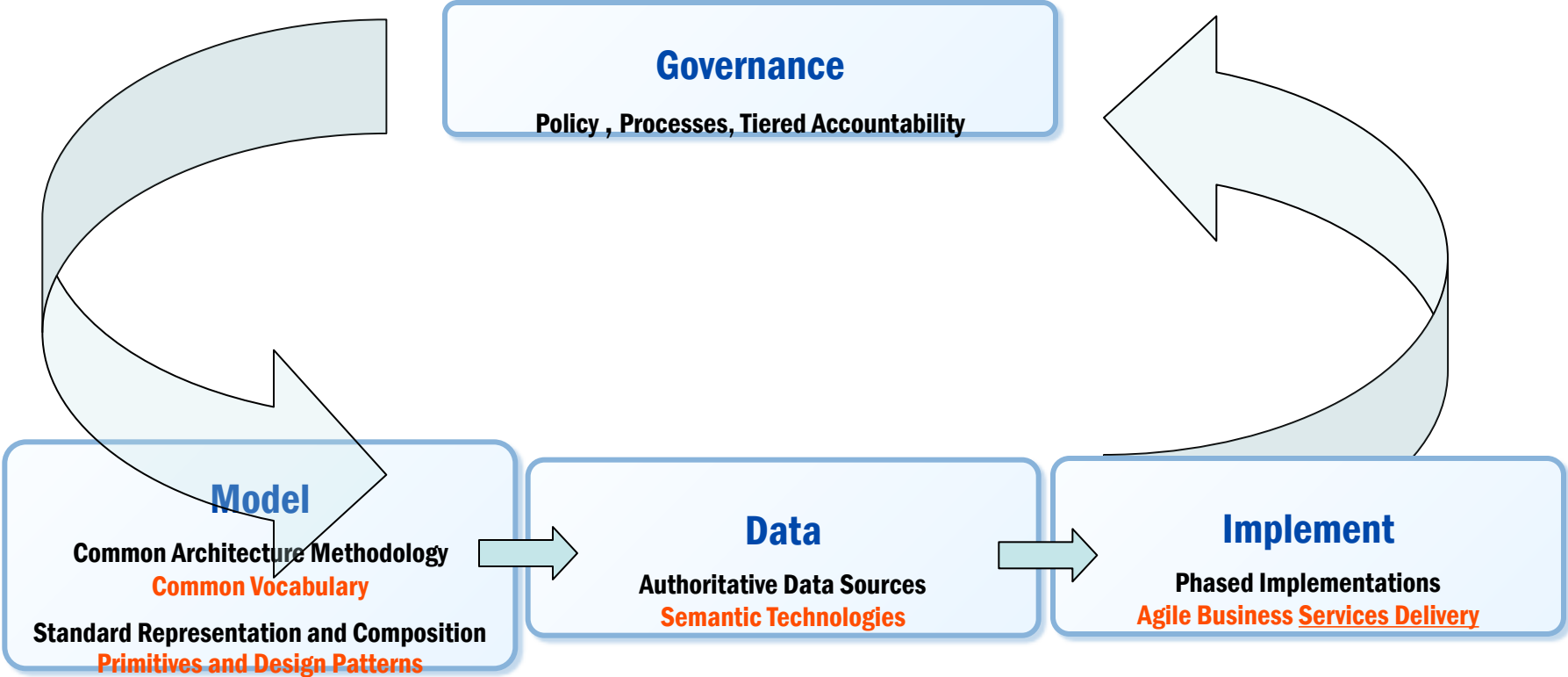
The One Takeaway

EIW is first BI realization of this

Net-Centricity:
Data Sharing

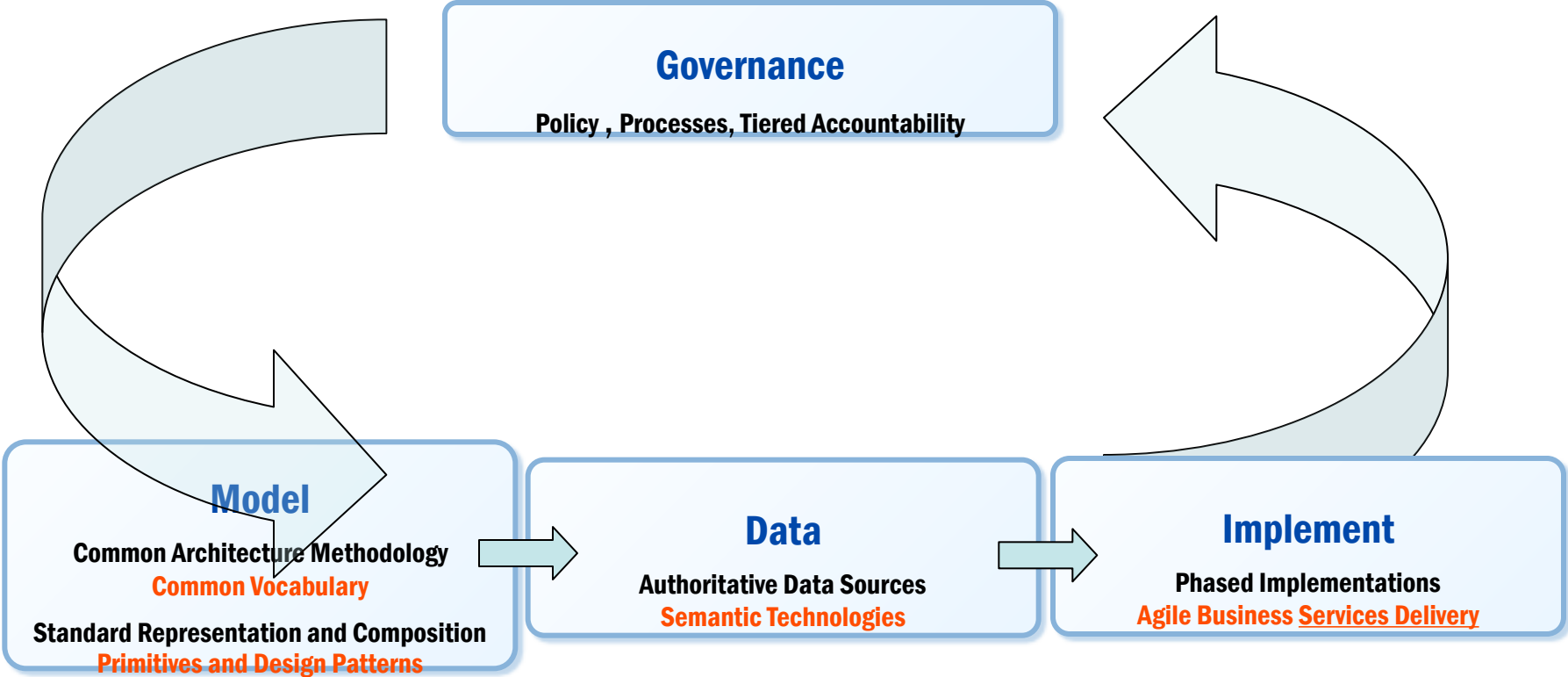


Agile, Architecture-Driven, DoD Business Capability Delivery





Agile, Architecture-Driven, DoD Business Capability Delivery



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



Thank you!

Questions?
Dennis.Wisnosky@osd.mil

