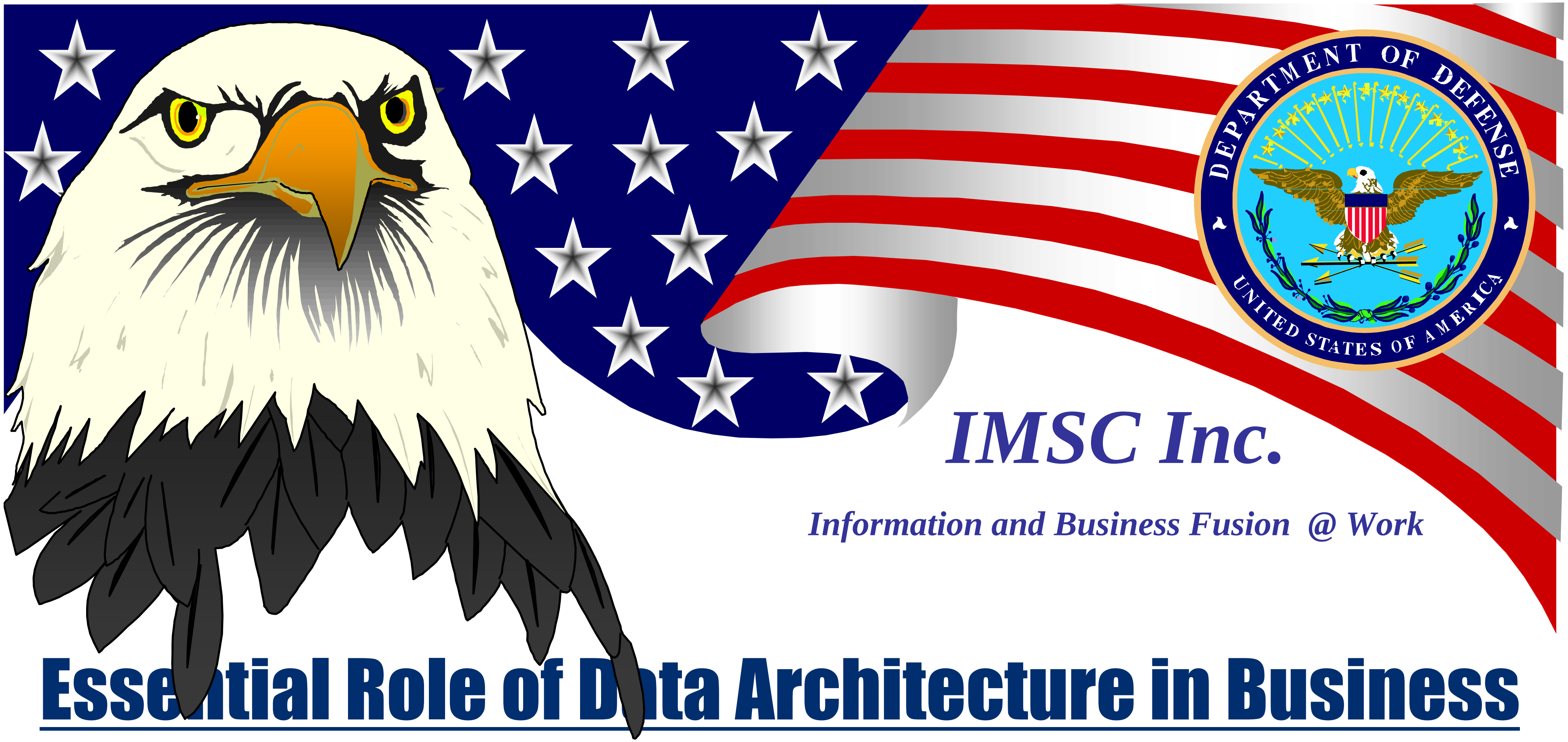


IMSC Inc.

Information and Business Fusion @ Work

Essential Role of Data Architecture in Business Architecture & SOA

William J. Mancuso

President & CTO

Information Management Solutions Consultants *Inc.*

&

SOA Lead BTA, DoD

William J. Mancuso

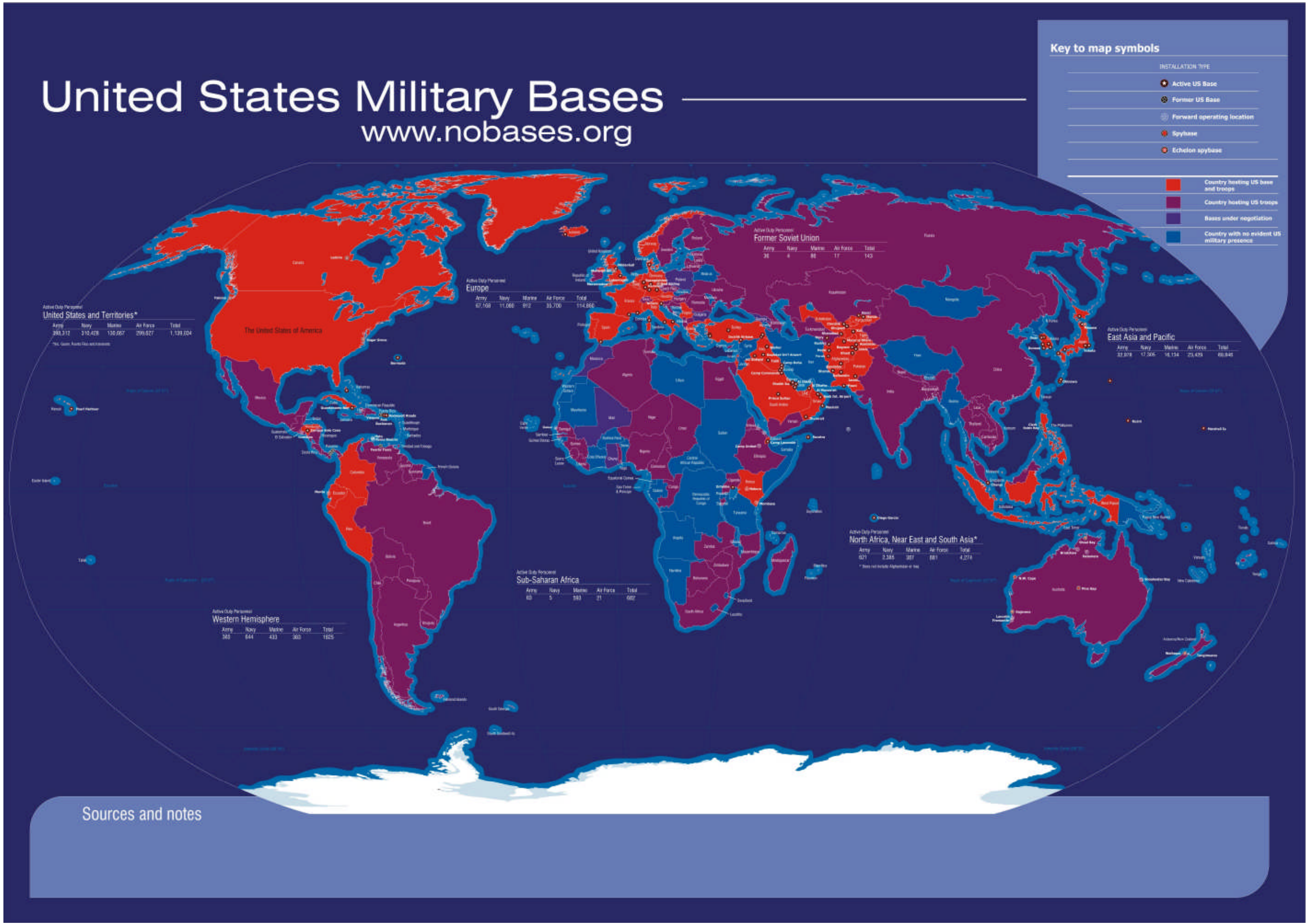
William.Mancuso@IMSC.us
Lead SOA Architect for the BTA in the DoD
President IMSC Inc. 703-635-0930

Mr. Mancuso is the President of Information Management Solutions Consultants Inc. and a Internationally recognized expert in the field of Enterprise Architecture, Data Strategy, SOA and EIM. He is currently one of the Lead SOA architects for the BTA in DoD. He spent five years as the Chief Enterprise Architect for the Office of Deputy under Secretary of Defense. Mr Mancuso architected DoD Integrated Data Environment (IDE) and the RFID architecture for the DoD’s Supply Chain. He spent 20 years plus in industry with a focus on integrating industry and technology to transform the way business processes are implemented and executed. Mr. Mancuso brings a strong commercial perspective to the federal government.

Topic

We will be discussing data architecture as is relates to business and not just IT with a focus on SOA. We will also be discussing why Architecture is important for a communicating between business and IT. Part of the discussion will be around Ontology and semantics as it relates to business. In the process we will look at SOA maturity models and how and where a Data Architecture and Business architecture come together to achieve SOA enterprise.

The “Enterprise”


United States Military Bases
www.nobases.org
Key to map symbols
INSTALLATION TYPE
Active US Base
Former US Base
Forward operating location
Spybase
Echelon spybase
Country hosting US base and troops
Country hosting US troops
Bases under negotiation
Country with no evident US military presence
The United States of America
Sources and notes

Active Duty Personnel
United States and Territories*

Army	Navy	Marine	Air Force	Total
398,312	310,426	130,007	299,627	1,139,034

*Incl. Guam, Puerto Rico and Hawaii

Active Duty Personnel
Europe

Army	Navy	Marine	Air Force	Total
67,108	11,060	912	35,700	114,860

Active Duty Personnel
Former Soviet Union

Army	Navy	Marine	Air Force	Total
36	4	86	17	143

Active Duty Personnel
East Asia and Pacific

Army	Navy	Marine	Air Force	Total
32,978	17,305	16,134	23,429	89,846

Active Duty Personnel
North Africa, Near East and South Asia*

Army	Navy	Marine	Air Force	Total
621	2,385	387	881	4,274

* Does not include Afghanistan or Iraq

Active Duty Personnel
Sub-Saharan Africa

Army	Navy	Marine	Air Force	Total
63	5	593	21	682

Active Duty Personnel
Western Hemisphere

Army	Navy	Marine	Air Force	Total
368	644	433	380	1825

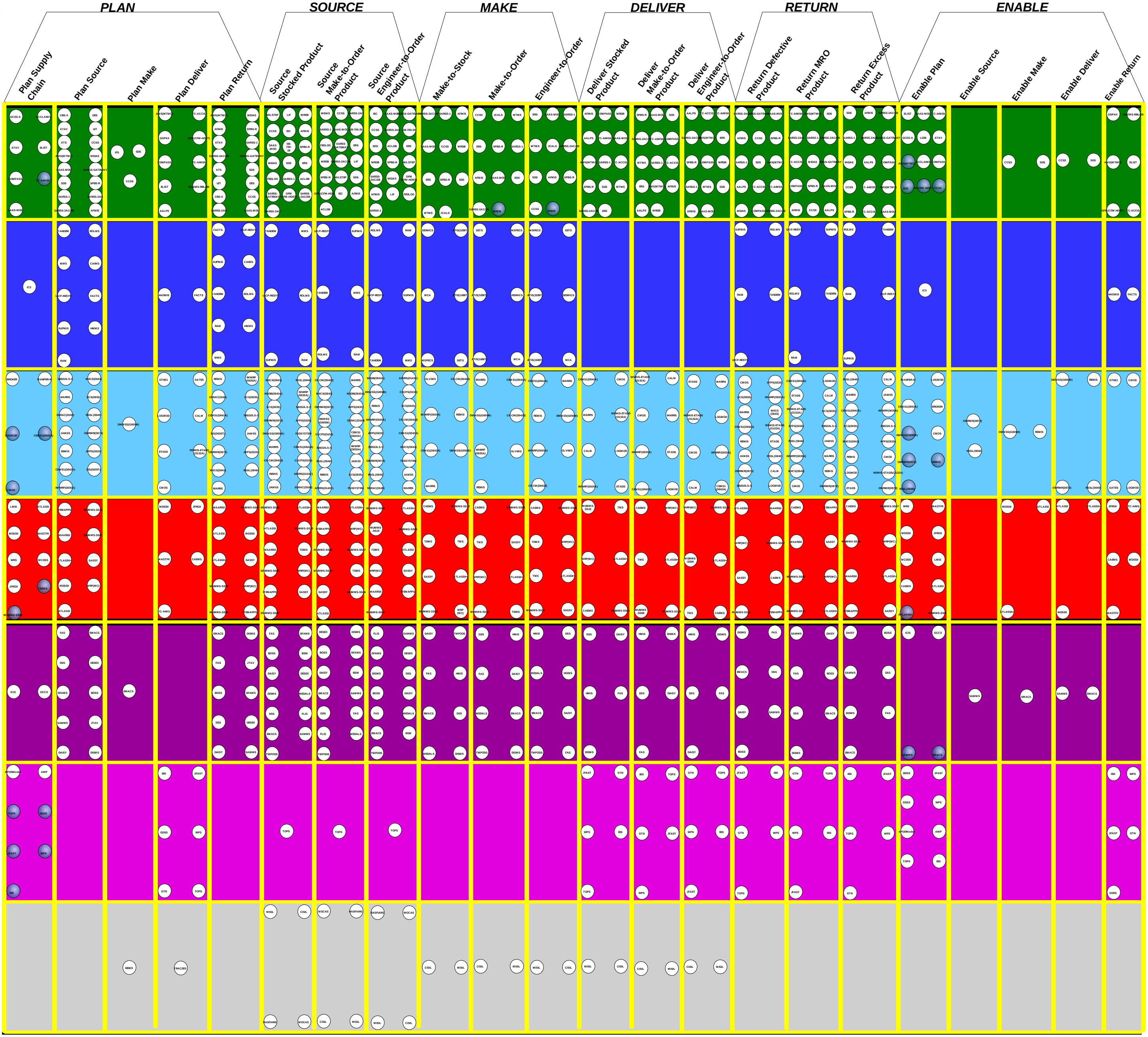
DoD ENTERPRISE LOGISTICS

Operational Activity to System Function Traceability Matrix (SV-5)

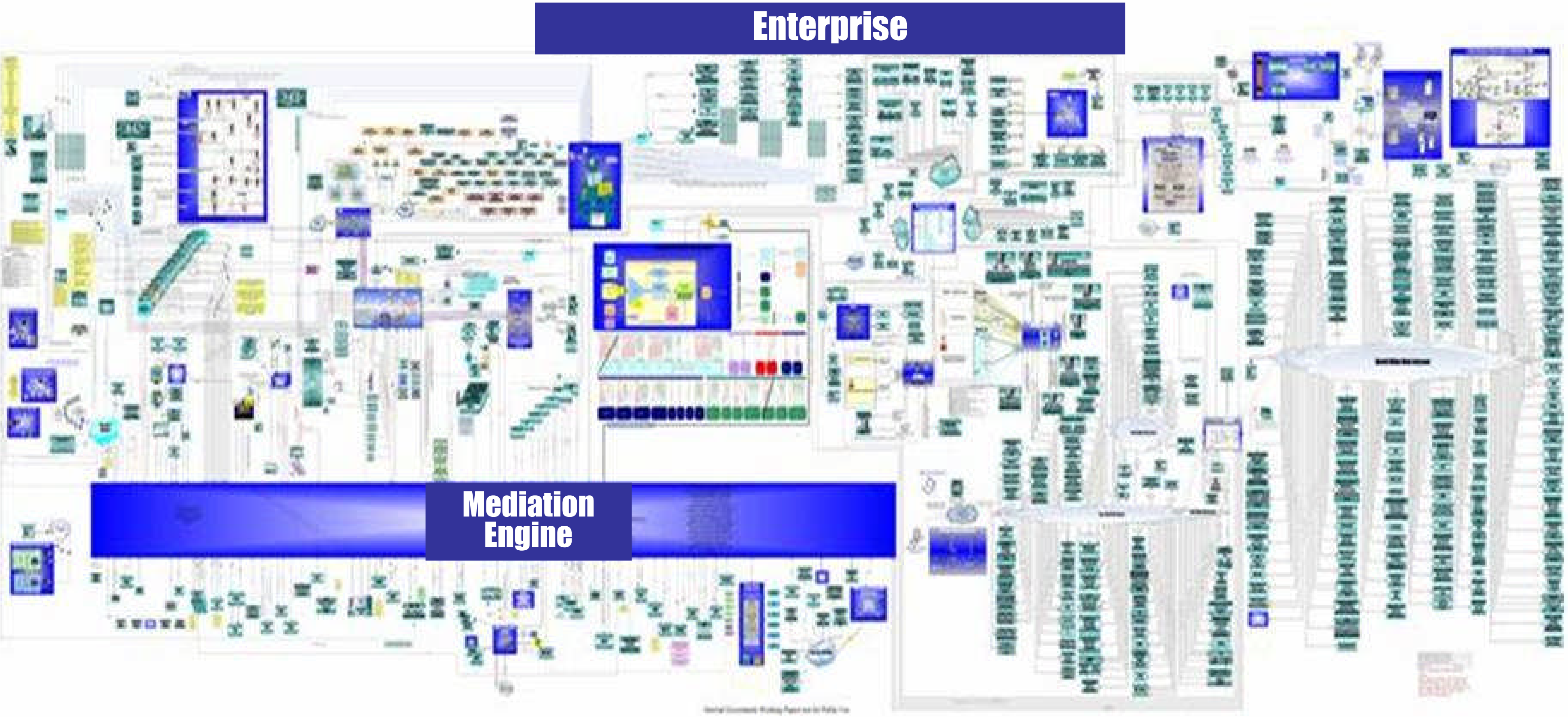
NOTE: The data displayed in this diagram is collected from the LSM's Future Logistics Enterprise OV-5.

○ = System with Operational to System Process Mapping

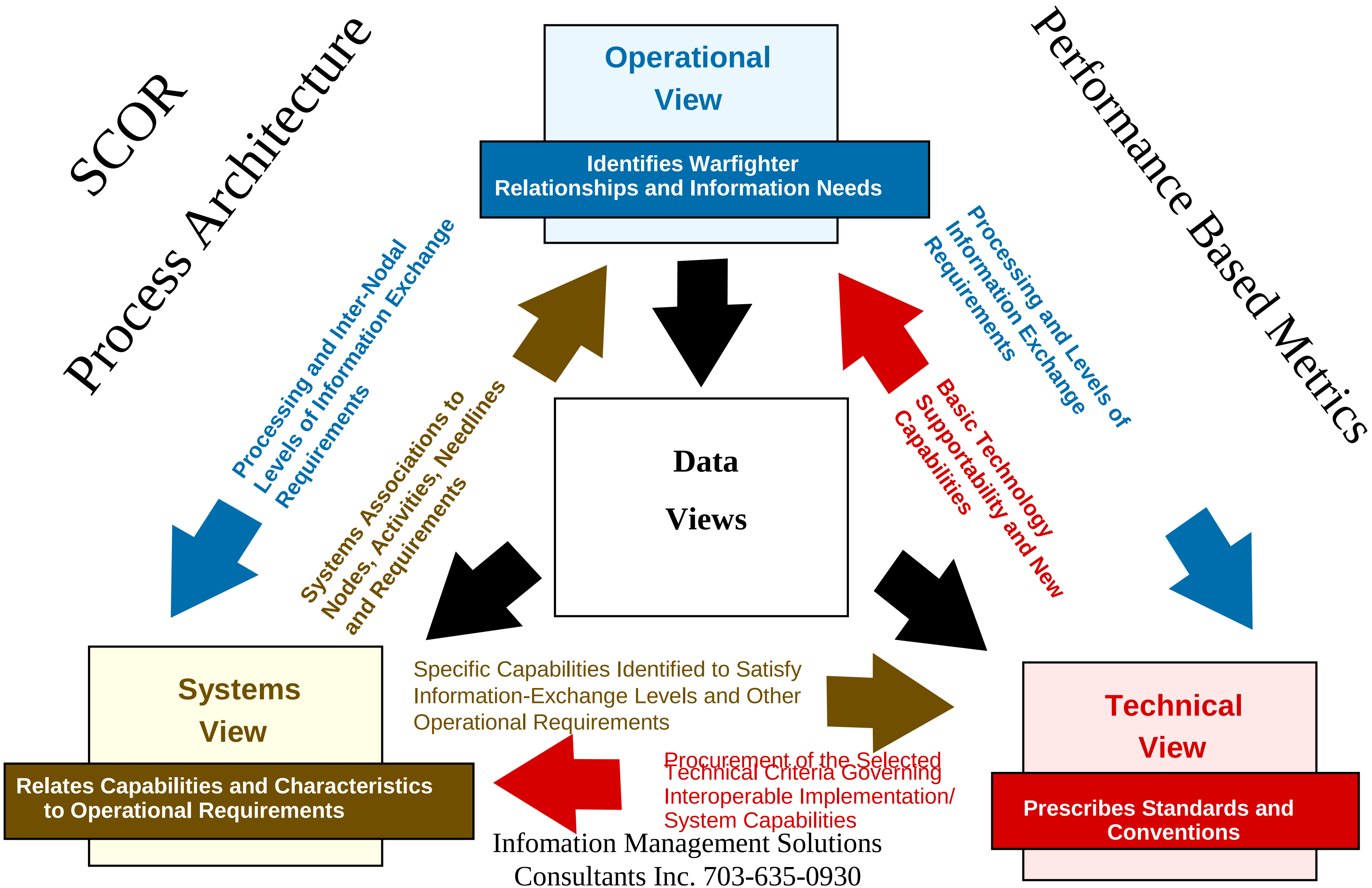
● = System with Operational to System Activity Mapping


PLAN
Plan Supply Chain
Plan Source
Plan Make
Plan Deliver
Plan Return
SOURCE
Source Stocked Product
Source Make-to-Order Product
Source Engineer-to-Order Product
MAKE
Make-to-Stock
Make-to-Order
Engineer-to-Order
DELIVER
Deliver Stocked Product
Deliver Make-to-Order Product
Deliver Engineer-to-Order Product
RETURN
Return Defective Product
Return MRO Product
Return Excess Product
ENABLE
Enable Plan
Enable Source
Enable Make
Enable Deliver
Enable Return
ARMY
NAVY
AIR FORCE (USAF)
MARINE CORPS (USMC)
DLA
TRANSCOM
OTHER

Enterprise Systems Interfaces and Transaction Flows


Enterprise
Mediation Engine

Logistics Enterprise Architecture Blueprint



SCOR

Process Architecture

Performance Based Metrics

Operational View

Identifies Warfighter Relationships and Information Needs

Processing and Inter-Nodal Levels of Information Exchange Requirements

Processing and Levels of Information Exchange Requirements

Systems Associations to Nodes, Activities, Needlines and Requirements

Basic Technology Supportability and New Capabilities

Data Views

Systems View

Relates Capabilities and Characteristics to Operational Requirements

Specific Capabilities Identified to Satisfy Information-Exchange Levels and Other Operational Requirements

Procurement of the Selected Technical Criteria Governing Interoperable Implementation/ System Capabilities

Technical View

Prescribes Standards and Conventions

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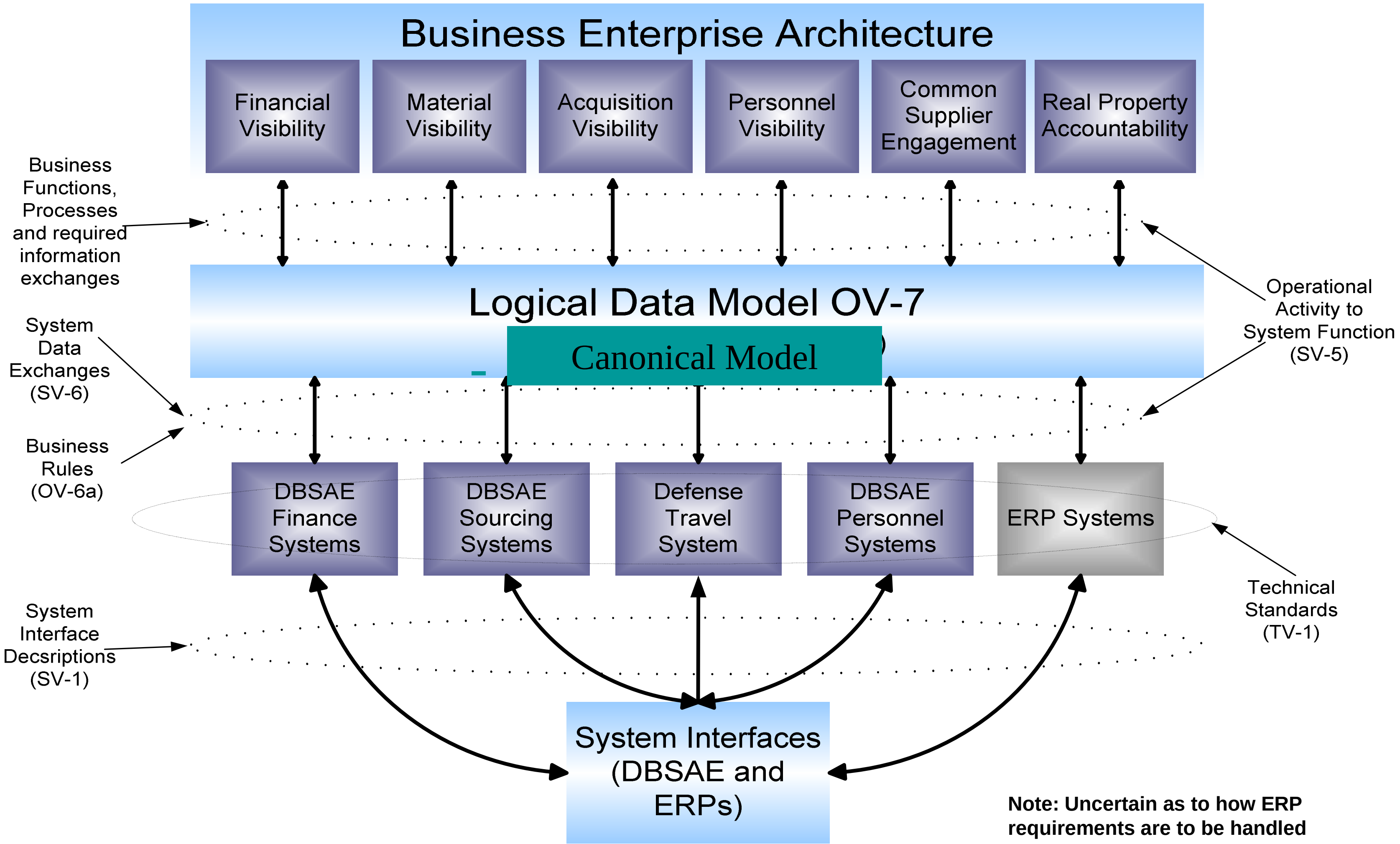
Business Enterprise Architecture



Business Enterprise Architecture

Financial Visibility

Material Visibility

Acquisition Visibility

Personnel Visibility

Common Supplier Engagement

Real Property Accountability

Business Functions, Processes and required information exchanges

Operational Activity to System Function (SV-5)

Logical Data Model OV-7

Canonical Model

System Data Exchanges (SV-6)

Business Rules (OV-6a)

DBSAE Finance Systems

DBSAE Sourcing Systems

Defense Travel System

DBSAE Personnel Systems

ERP Systems

Technical Standards (TV-1)

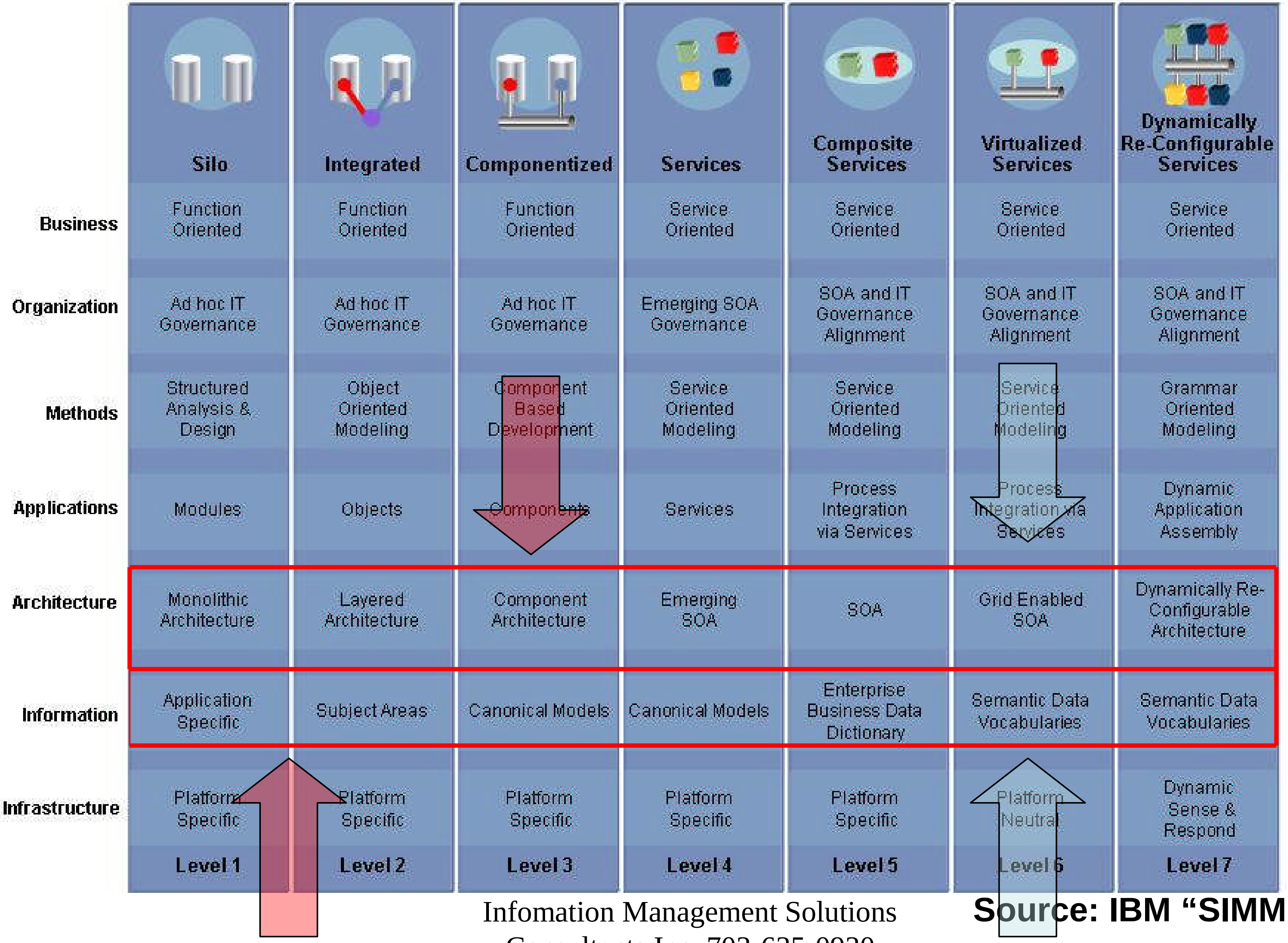
System Interface Decsriptions (SV-1)

System Interfaces (DBSAE and ERPs)

Note: Uncertain as to how ERP requirements are to be handled within the process

SOA Maturity Models and Business Architecture

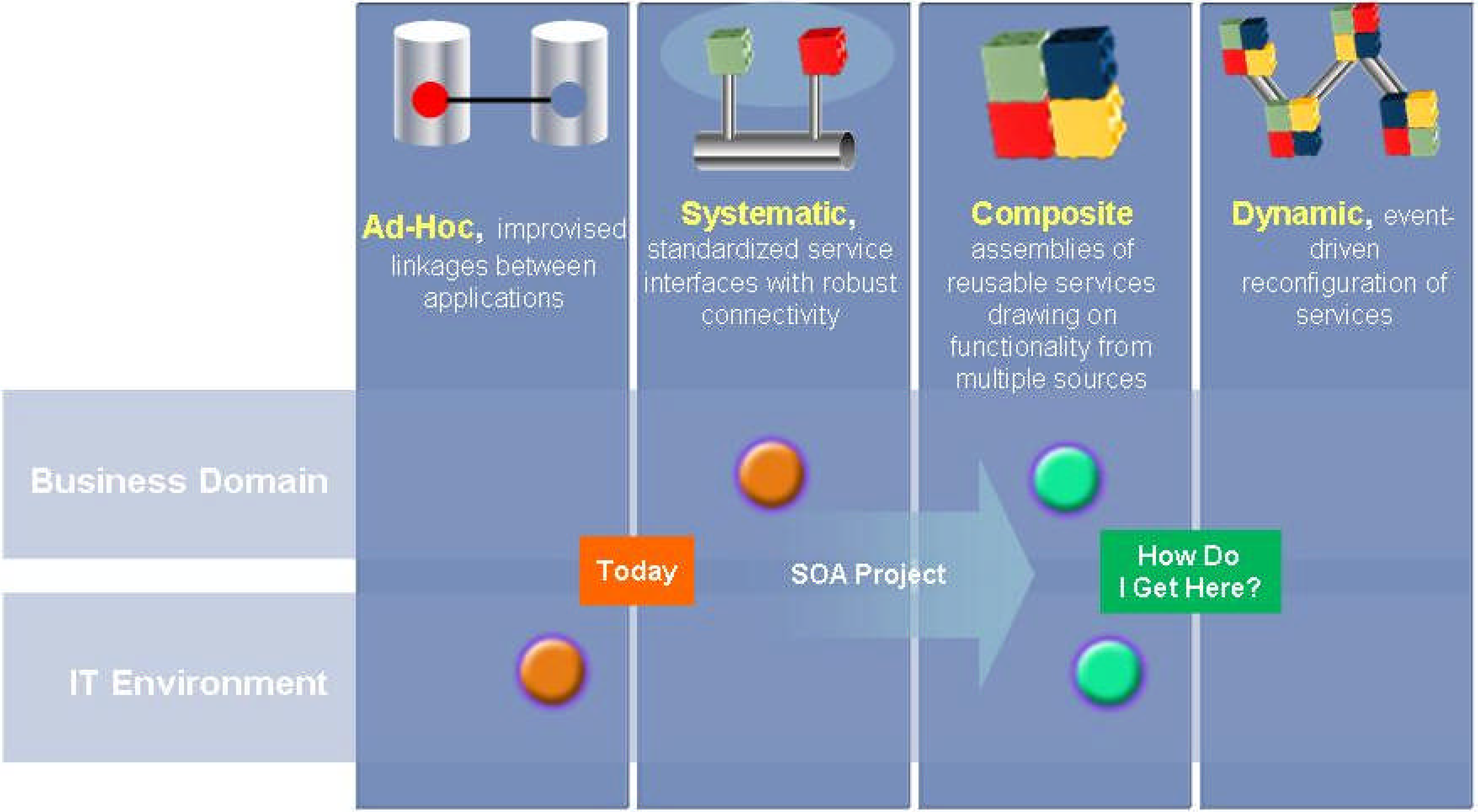
Service Integration Maturity Model



	Silo	Integrated	Componentized	Services	Composite Services	Virtualized Services	Dynamically Re-Configurable Services
Business	Function Oriented	Function Oriented	Function Oriented	Service Oriented	Service Oriented	Service Oriented	Service Oriented
Organization	Ad hoc IT Governance	Ad hoc IT Governance	Ad hoc IT Governance	Emerging SOA Governance	SOA and IT Governance Alignment	SOA and IT Governance Alignment	SOA and IT Governance Alignment
Methods	Structured Analysis & Design	Object Oriented Modeling	Component Based Development	Service Oriented Modeling	Service Oriented Modeling	Service Oriented Modeling	Grammar Oriented Modeling
Applications	Modules	Objects	Components	Services	Process Integration via Services	Process Integration via Services	Dynamic Application Assembly
Architecture	Monolithic Architecture	Layered Architecture	Component Architecture	Emerging SOA	SOA	Grid Enabled SOA	Dynamically Re-Configurable Architecture
Information	Application Specific	Subject Areas	Canonical Models	Canonical Models	Enterprise Business Data Dictionary	Semantic Data Vocabularies	Semantic Data Vocabularies
Infrastructure	Platform Specific	Platform Specific	Platform Specific	Platform Specific	Platform Specific	Platform Neutral	Dynamic Sense & Respond
	Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**	**Level 7**

Source: IBM “SIMM”

Where We are in BMA SOA and Where We Want to Go



Ad-Hoc, improvised linkages between applications

Systematic, standardized service interfaces with robust connectivity

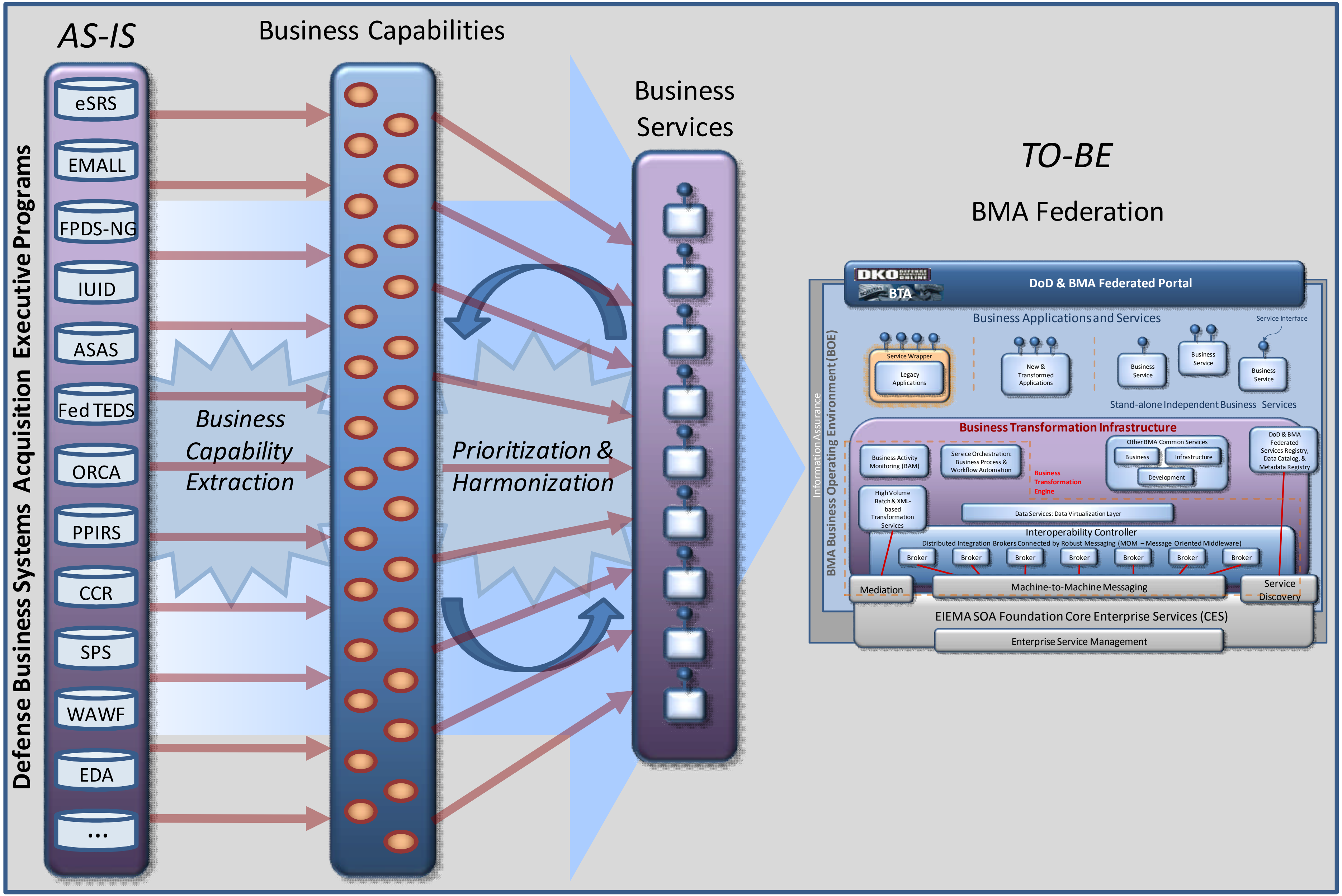
Composite assemblies of reusable services drawing on functionality from multiple sources

Dynamic, event-driven reconfiguration of services

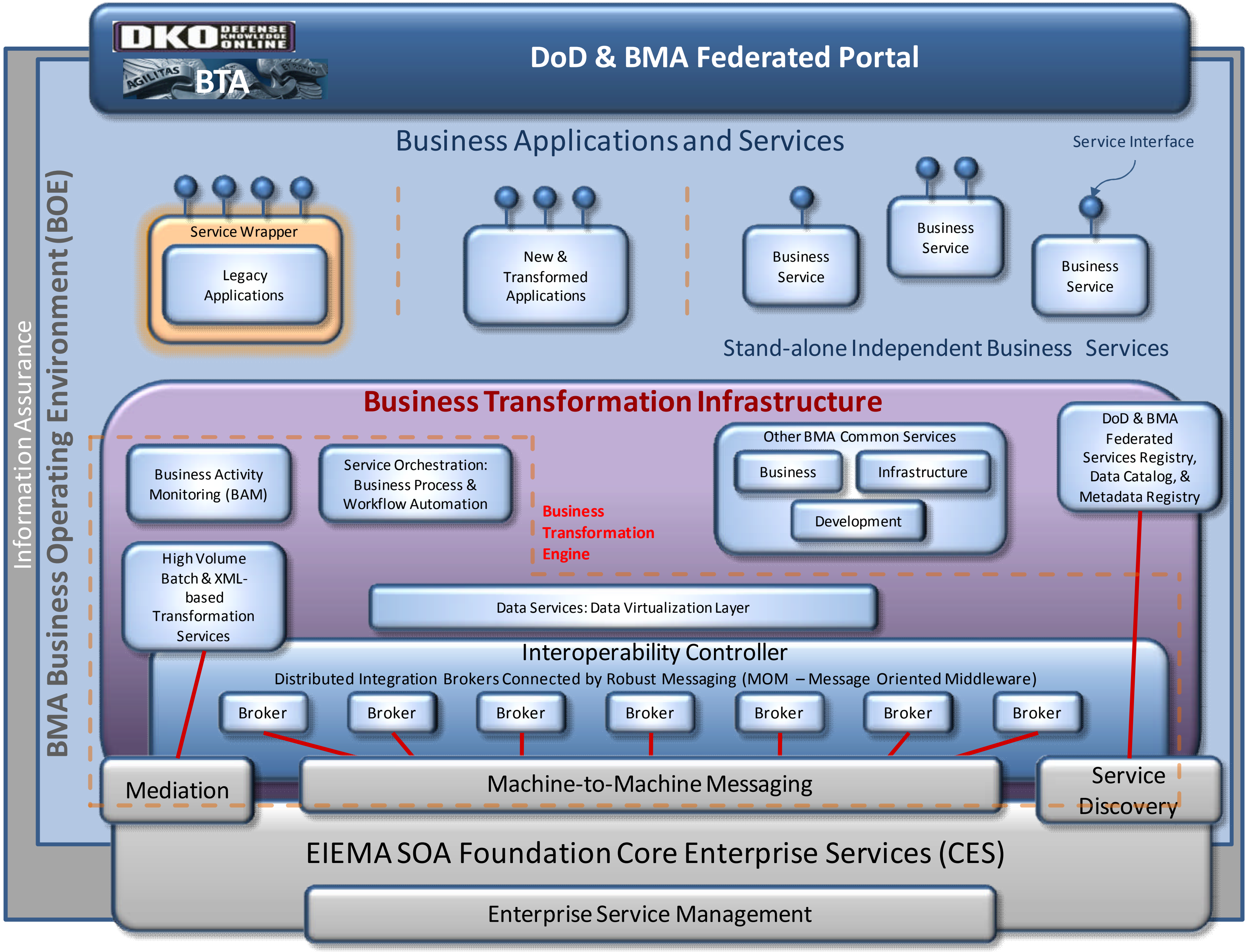
Business Domain
IT Environment
Today
SOA Project
How Do
I Get Here?

Source: What's New!
IBM SOA Maturity Model

BMA Roadmap to SOA, Top-down approach


AS-IS
Business Capabilities
Defense Business Systems Acquisition Executive Programs
eSRS
EMALL
FPDS-NG
IUID
ASAS
Fed TEDS
ORCA
PPIRS
CCR
SPS
WAWF
EDA
...
Business Capability Extraction
Prioritization & Harmonization
Business Services
TO-BE
BMA Federation
DKO
BTA
DoD & BMA Federated Portal
Business Applications and Services
Service Interface
Service Wrapper
Legacy Applications
New & Transformed Applications
Business Service
Business Service
Business Service
Stand-alone Independent Business Services
Information Assurance
BMA Business Operating Environment (BOE)
Business Transformation Infrastructure
Business Activity Monitoring (BAM)
Service Orchestration: Business Process & Workflow Automation
Business Transformation Engine
Other BMA Common Services
Business
Infrastructure
Development
DoD & BMA Federated Services Registry, Data Catalog, & Metadata Registry
High Volume Batch & XML-based Transformation Services
Data Services: Data Virtualization Layer
Interoperability Controller
Distributed Integration Brokers Connected by Robust Messaging (MOM – Message Oriented Middleware)
Broker
Broker
Broker
Broker
Broker
Broker
Broker
Mediation
Machine-to-Machine Messaging
Service Discovery
EIEMA SOA Foundation Core Enterprise Services (CES)
Enterprise Service Management

Systems Federation Via the Business Transformation Engine Within the BOE



DKO DEFENSE KNOWLEDGE ONLINE

BTA

DoD & BMA Federated Portal

Information Assurance

BMA Business Operating Environment (BOE)

Business Applications and Services

Service Interface

Service Wrapper

Legacy Applications

New & Transformed Applications

Business Service

Business Service

Business Service

Stand-alone Independent Business Services

Business Transformation Infrastructure

Business Activity Monitoring (BAM)

Service Orchestration: Business Process & Workflow Automation

Business Transformation Engine

Other BMA Common Services

Business

Infrastructure

Development

DoD & BMA Federated Services Registry, Data Catalog, & Metadata Registry

High Volume Batch & XML-based Transformation Services

Data Services: Data Virtualization Layer

Interoperability Controller

Distributed Integration Brokers Connected by Robust Messaging (MOM – Message Oriented Middleware)

Broker

Broker

Broker

Broker

Broker

Broker

Broker

Mediation

Machine-to-Machine Messaging

Service Discovery

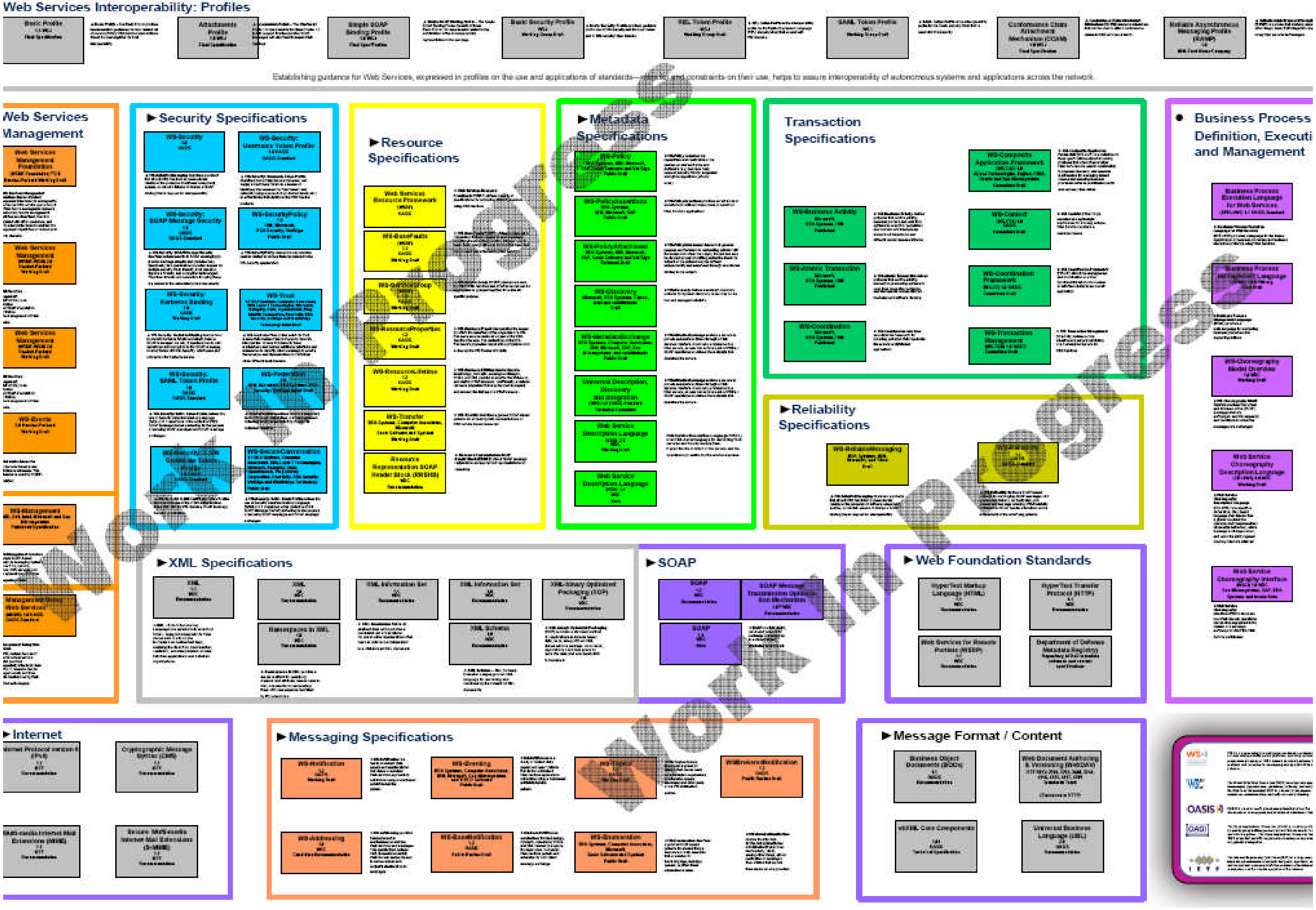
EIEMA SOA Foundation Core Enterprise Services (CES)

Enterprise Service Management

Business
Transformation

SOA Platform Challenge

Dennis E. Wisnosky
BMA – CTO


Web Services Interoperability: Profiles
Basic Profile
Attachments Profile
Simple SOAP Binding Profile
Basic Security Profile
REL Token Profile
SAML Token Profile
Conformance Claim Attachment Mechanism (CCAM)
Reliable Asynchronous Messaging Profile (RAMP)
Establishing guidance for Web Services, expressed in profiles on the use and applications of standards—and constraints on their use, helps to assure interoperability of autonomous systems and applications across the network.
Web Services Management
Web Services Management Foundation
Web Services Management
Web Services Management
WS-Events
WS-Management
Management Using Web Services
Security Specifications
WS-Security
WS-Security: Username Token Profile
WS-Security: SOAP Message Security
WS-SecurityPolicy
WS-Security: Kerberos Binding
WS-Trust
WS-Security: SAML Token Profile
WS-Federation
WS-SecureConversation
Resource Specifications
Web Services Resource Framework (WSRF)
WS-BaseFaults
WS-ServiceGroup
WS-ResourceProperties
WS-ResourceLifetime
WS-Transfer
Resource Representation SOAP Header Block (RRSHB)
Metadata Specifications
WS-Policy
WS-PolicyAssertions
WS-PolicyAttachment
WS-Discovery
WS-MetadataExchange
Universal Description, Discovery and Integration
Web Service Description Language
Web Service Description Language
Transaction Specifications
WS-Composite Application Framework
WS-Business Activity
WS-Context
WS-Atomic Transaction
WS-Coordination Framework
WS-Coordination
WS-Transaction Management
Reliability Specifications
WS-ReliableMessaging
WS-Reliability
Business Process Definition, Executi
and Management
Business Process Execution Language for Web Services
Business Process Management Language
WS-Choreography Model Overview
Web Service Choreography Description Language
Web Service Choreography Interface
XML Specifications
XML
XML
XML Information Set
XML Information Set
XML-binary Optimized Packaging (XOP)
Namespaces in XML
XML Schema
SOAP
SOAP
SOAP Message Transmission Optimization Mechanism
SOAP
Web Foundation Standards
HyperText Markup Language (HTML)
HyperText Transfer Protocol (HTTP)
Web Services for Remote Portlets (WSRP)
Department of Defense Metadata Registry
Internet
Internet Protocol version 6 (IPv6)
Cryptographic Message Syntax (CMS)
Multi-media Internet Mail Extensions (MIME)
Secure Multi-media Internet Mail Extensions (S-MIME)
Messaging Specifications
WS-Notification
WS-Eventing
WS-Topics
WS-BrokeredNotification
WS-Addressing
WS-BaseNotification
WS-Enumeration
Message Format / Content
Business Object Documents (BODs)
Web Document Authoring & Versioning (WebDAV)
ebXML Core Components
Universal Business Language (UBL)
WS-I
W3C
OASIS
IETF
Work In Progress
Work In Progress

Strategic and Tactical Data Modeling

What is a Vocabulary?

- **All terms used, developed, or understood by, a particular person or group for a particular domain or purpose.**
- **Domain lexicons, glossaries, subject headings, metadata element sets, topic maps, taxonomies, thesauri, and ontologies are all types of vocabularies.**
- **Vocabularies are often specific to domains and communities of interest**

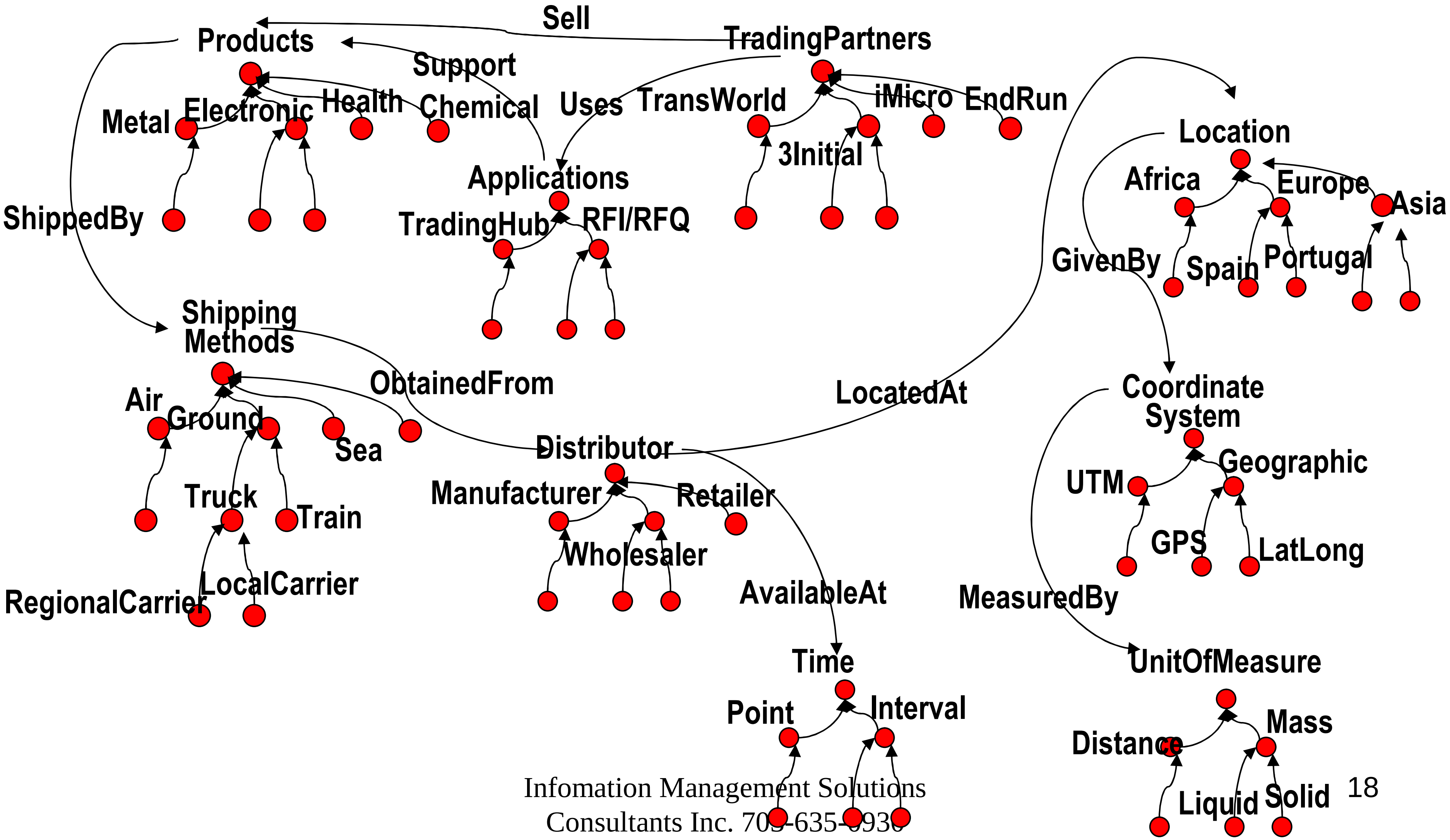
More fancifully called a canonical data model based on an Ontology

Canonical Data Model

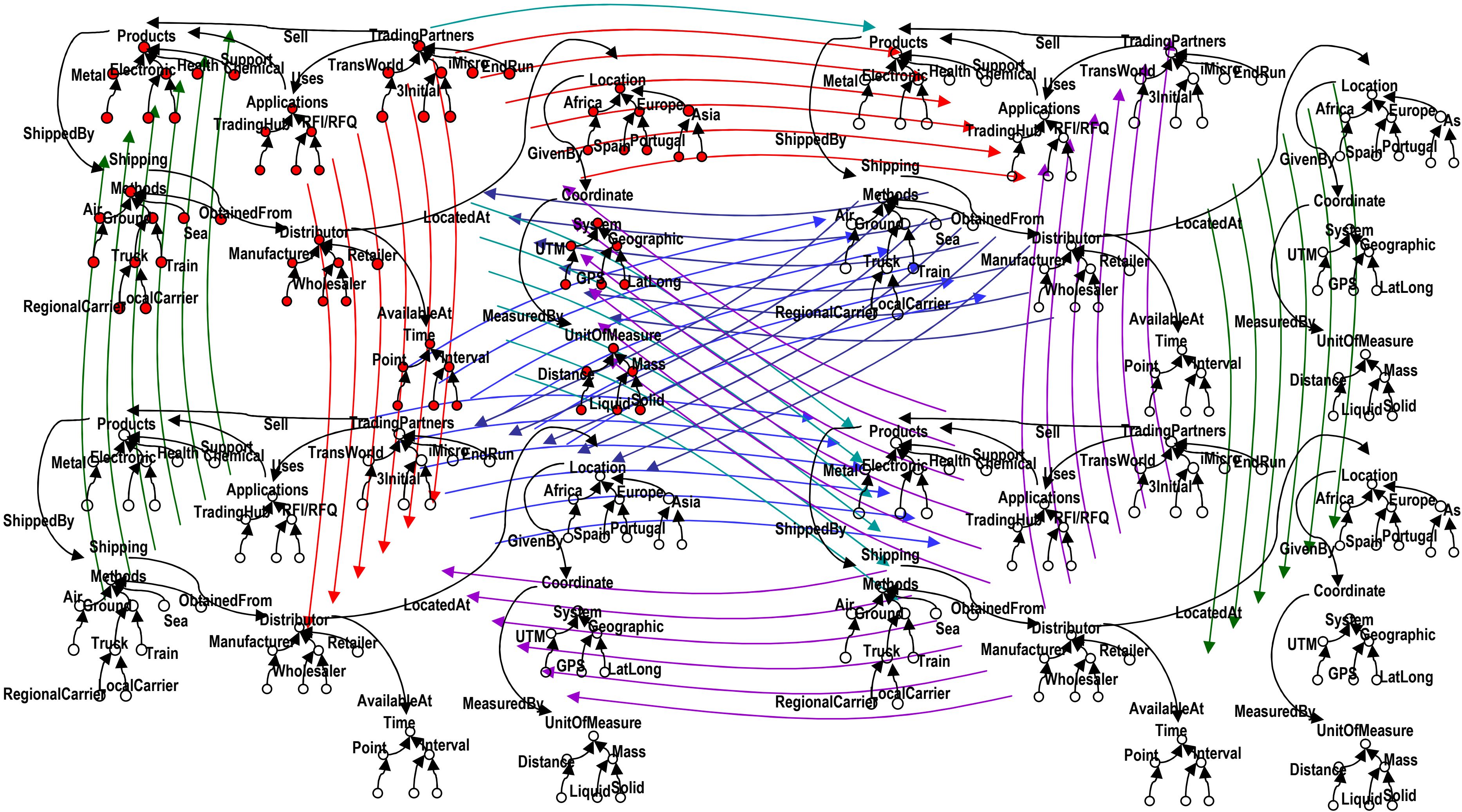
"A Canonical Data Model defines message formats that are independent from any specific application so that all applications can communicate with each other in this common format. If the internal format of an application changes, only the *message translator* between the affected application and the common *message channel* has to change, while all other applications and *message translators* remain unaffected." – ***Enterprise Integration Patterns, Gregor Hohpe, Bobby Woolf***

"A data model that represents the inherent structure of data without regard to either individual use or hardware or software implementation." – ***Vertaasis Inc.***

Generic Electronic Commerce Example:


Sell
Products
TradingPartners
Support
Uses
Metal
Electronic
Health
Chemical
TransWorld
iMicro
EndRun
3Initial
Applications
TradingHub
RFI/RFQ
ShippedBy
Location
Africa
Europe
Asia
Spain
Portugal
GivenBy
Shipping Methods
Air
Ground
Sea
ObtainedFrom
LocatedAt
Distributor
Manufacturer
Retailer
Wholesaler
Truck
Train
RegionalCarrier
LocalCarrier
AvailableAt
Coordinate System
UTM
Geographic
GPS
LatLong
MeasuredBy
Time
Point
Interval
UnitOfMeasure
Distance
Mass
Liquid
Solid

Now Assume Each Company Has Separate Enterprise Semantics, Multiply by the Number of Companies, & Have Them Interoperate and Preserve Semantics – Look Familiar?


Products
Sell
TradingPartners
Metal
Electronic
Health
Support
Chemical
Uses
TransWorld
iMicro
EndRun
3Initial
Applications
TradingHub
RFI/RFQ
ShippedBy
Shipping
Methods
Air
Ground
Sea
ObtainedFrom
Truck
Train
RegionalCarrier
LocalCarrier
Distributor
Manufacturer
Retailer
Wholesaler
LocatedAt
AvailableAt
Time
Point
Interval
Location
Africa
Europe
Asia
Spain
Portugal
GivenBy
Coordinate
System
Geographic
UTM
GPS
LatLong
MeasuredBy
UnitOfMeasure
Distance
Mass
Liquid
Solid

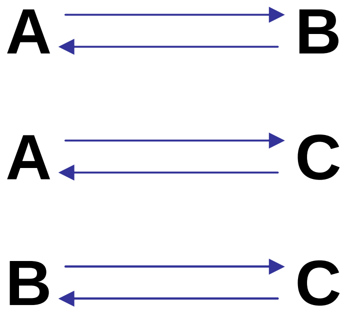
Try doing this without Ontologies! You can, but it's a Nightmare, and it COSTS: Now & Later!

Semantic Issues: Complexity

- **An ontology allows for near linear semantic integration actually 2n-2 rather than n^2 - n integration**
  - Each application/database maps to the "lingua franca" of the ontology, rather than to each other

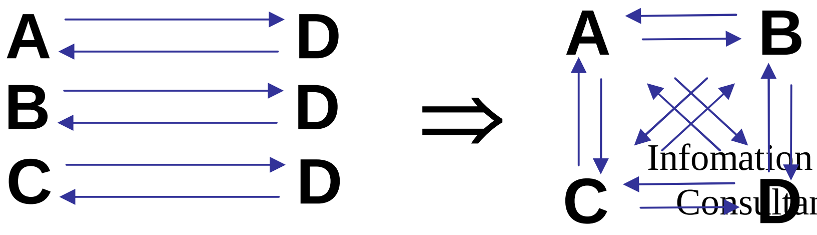
Dr. Leo Obrst

Ordinary Integration

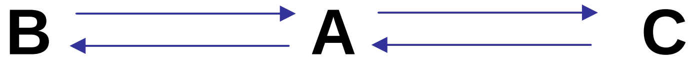


2 Nodes	2 Edges
3 Nodes	6 Edges
4 Nodes	12 Edges
5 Nodes	20 Edges

Add D:

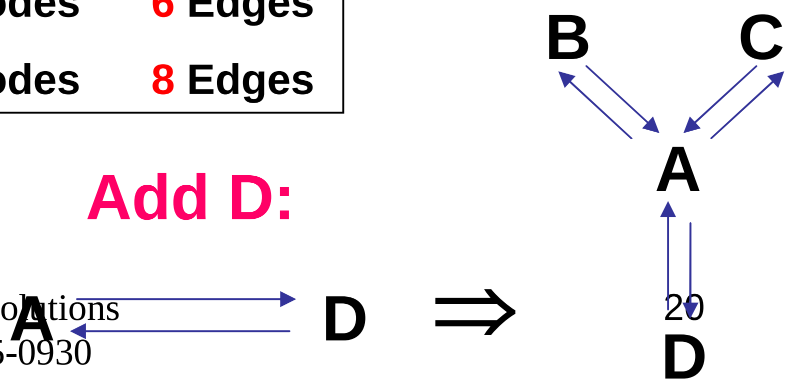


Ontology Integration



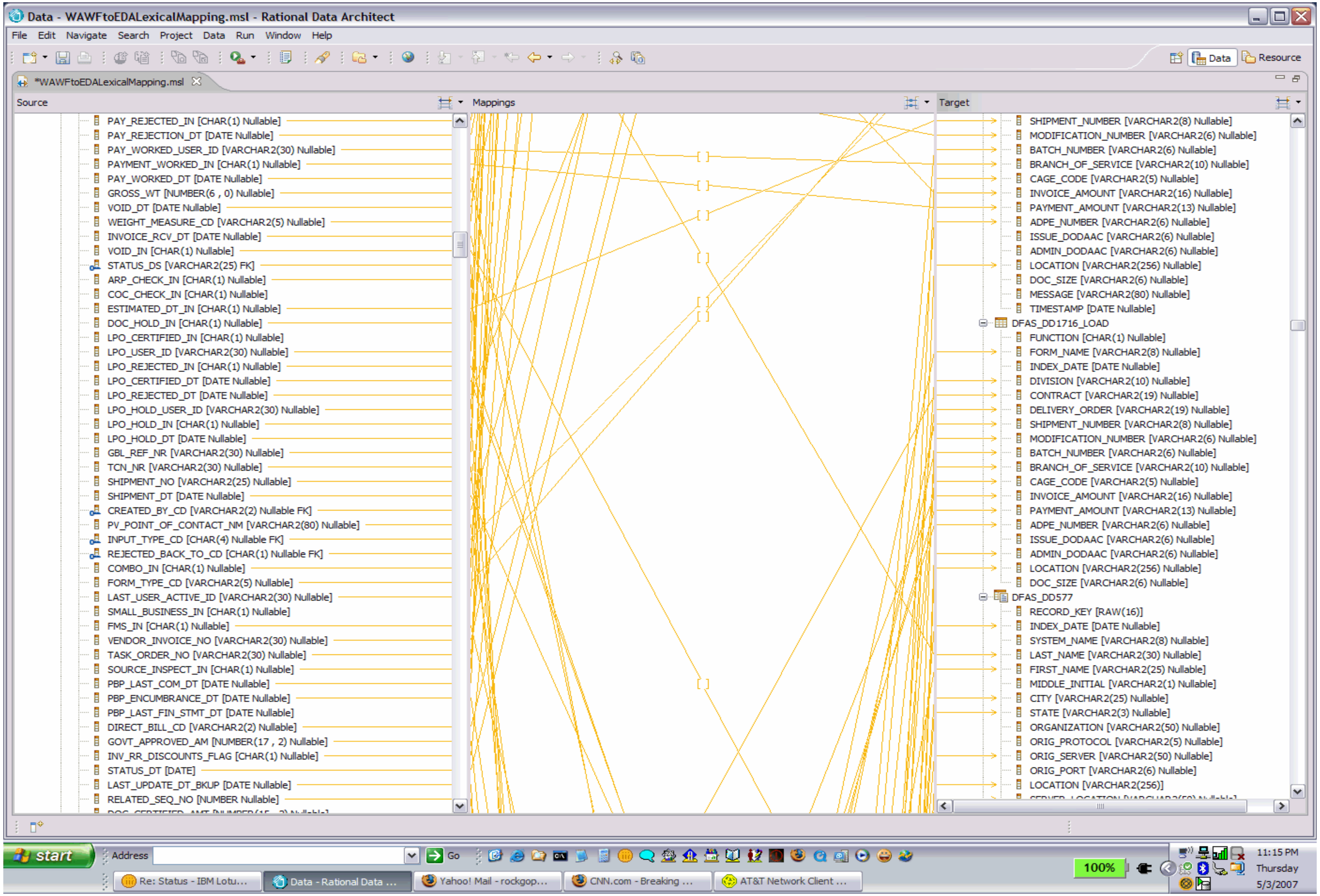
2 Nodes	2 Edges
3 Nodes	4 Edges
4 Nodes	6 Edges
5 Nodes	8 Edges

Add D:



Canonical Data Model Life-cycle

Bootstrapping



Source

PAY_REJECTED_IN [CHAR(1) Nullable]
PAY_REJECTION_DT [DATE Nullable]
PAY_WORKED_USER_ID [VARCHAR2(30) Nullable]
PAYMENT_WORKED_IN [CHAR(1) Nullable]
PAY_WORKED_DT [DATE Nullable]
GROSS_WT [NUMBER(6 , 0) Nullable]
VOID_DT [DATE Nullable]
WEIGHT_MEASURE_CD [VARCHAR2(5) Nullable]
INVOICE_RCV_DT [DATE Nullable]
VOID_IN [CHAR(1) Nullable]
STATUS_DS [VARCHAR2(25) FK]
ARP_CHECK_IN [CHAR(1) Nullable]
COC_CHECK_IN [CHAR(1) Nullable]
ESTIMATED_DT_IN [CHAR(1) Nullable]
DOC_HOLD_IN [CHAR(1) Nullable]
LPO_CERTIFIED_IN [CHAR(1) Nullable]
LPO_USER_ID [VARCHAR2(30) Nullable]
LPO_REJECTED_IN [CHAR(1) Nullable]
LPO_CERTIFIED_DT [DATE Nullable]
LPO_REJECTED_DT [DATE Nullable]
LPO_HOLD_USER_ID [VARCHAR2(30) Nullable]
LPO_HOLD_IN [CHAR(1) Nullable]
LPO_HOLD_DT [DATE Nullable]
GBL_REF_NR [VARCHAR2(30) Nullable]
TCN_NR [VARCHAR2(30) Nullable]
SHIPMENT_NO [VARCHAR2(25) Nullable]
SHIPMENT_DT [DATE Nullable]
CREATED_BY_CD [VARCHAR2(2) Nullable FK]
PV_POINT_OF_CONTACT_NM [VARCHAR2(80) Nullable]
INPUT_TYPE_CD [CHAR(4) Nullable FK]
REJECTED_BACK_TO_CD [CHAR(1) Nullable FK]
COMBO_IN [CHAR(1) Nullable]
FORM_TYPE_CD [VARCHAR2(5) Nullable]
LAST_USER_ACTIVE_ID [VARCHAR2(30) Nullable]
SMALL_BUSINESS_IN [CHAR(1) Nullable]
FMS_IN [CHAR(1) Nullable]
VENDOR_INVOICE_NO [VARCHAR2(30) Nullable]
TASK_ORDER_NO [VARCHAR2(30) Nullable]
SOURCE_INSPECT_IN [CHAR(1) Nullable]
PBP_LAST_COM_DT [DATE Nullable]
PBP_ENCUMBRANCE_DT [DATE Nullable]
PBP_LAST_FIN_STMT_DT [DATE Nullable]
DIRECT_BILL_CD [VARCHAR2(2) Nullable]
GOVT_APPROVED_AM [NUMBER(17 , 2) Nullable]
INV_RR_DISCOUNTS_FLAG [CHAR(1) Nullable]
STATUS_DT [DATE]
LAST_UPDATE_DT_BKUP [DATE Nullable]
RELATED_SEQ_NO [NUMBER Nullable]

Target

SHIPMENT_NUMBER [VARCHAR2(8) Nullable]
MODIFICATION_NUMBER [VARCHAR2(6) Nullable]
BATCH_NUMBER [VARCHAR2(6) Nullable]
BRANCH_OF_SERVICE [VARCHAR2(10) Nullable]
CAGE_CODE [VARCHAR2(5) Nullable]
INVOICE_AMOUNT [VARCHAR2(16) Nullable]
PAYMENT_AMOUNT [VARCHAR2(13) Nullable]
ADPE_NUMBER [VARCHAR2(6) Nullable]
ISSUE_DODAAC [VARCHAR2(6) Nullable]
ADMIN_DODAAC [VARCHAR2(6) Nullable]
LOCATION [VARCHAR2(256) Nullable]
DOC_SIZE [VARCHAR2(6) Nullable]
MESSAGE [VARCHAR2(80) Nullable]
TIMESTAMP [DATE Nullable]

DFAS_DD1716_LOAD
- FUNCTION [CHAR(1) Nullable]
- FORM_NAME [VARCHAR2(8) Nullable]
- INDEX_DATE [DATE Nullable]
- DIVISION [VARCHAR2(10) Nullable]
- CONTRACT [VARCHAR2(19) Nullable]
- DELIVERY_ORDER [VARCHAR2(19) Nullable]
- SHIPMENT_NUMBER [VARCHAR2(8) Nullable]
- MODIFICATION_NUMBER [VARCHAR2(6) Nullable]
- BATCH_NUMBER [VARCHAR2(6) Nullable]
- BRANCH_OF_SERVICE [VARCHAR2(10) Nullable]
- CAGE_CODE [VARCHAR2(5) Nullable]
- INVOICE_AMOUNT [VARCHAR2(16) Nullable]
- PAYMENT_AMOUNT [VARCHAR2(13) Nullable]
- ADPE_NUMBER [VARCHAR2(6) Nullable]
- ISSUE_DODAAC [VARCHAR2(6) Nullable]
- ADMIN_DODAAC [VARCHAR2(6) Nullable]
- LOCATION [VARCHAR2(256) Nullable]
- DOC_SIZE [VARCHAR2(6) Nullable]

DFAS_DD577
- RECORD_KEY [RAW(16)]
- INDEX_DATE [DATE Nullable]
- SYSTEM_NAME [VARCHAR2(8) Nullable]
- LAST_NAME [VARCHAR2(30) Nullable]
- FIRST_NAME [VARCHAR2(25) Nullable]
- MIDDLE_INITIAL [VARCHAR2(1) Nullable]
- CITY [VARCHAR2(25) Nullable]
- STATE [VARCHAR2(3) Nullable]
- ORGANIZATION [VARCHAR2(50) Nullable]
- ORIG_PROTOCOL [VARCHAR2(5) Nullable]
- ORIG_SERVER [VARCHAR2(50) Nullable]
- ORIG_PORT [VARCHAR2(6) Nullable]
- LOCATION [VARCHAR2(256)]

Bootstrapping Ontologies

- Step 1: Start at the bottom
  - Build vocabularies from existing physical systems
  - Finds and uses the terminology that’s important
- Step 2: Collaborate
  - The community can document, review, discuss and change
  - Human-readable documentation ***and*** formal vocabulary definition
- Step 3: Share and Use
  - People access the vocabularies through web browsers to view the natural language documentation and navigate formal relationships
  - Machines can download vocabularies and use

Step 1: Start at the Bottom

- Databases and message structures don’t keep semantics
  - What information do we have?
  - What does it mean to the enterprise?
  - How does all this information align?
- Find and use the semantics!
  - Combine the terms used with knowledge bases to discover and assign semantics to information
  - Store the terms, definitions and semantics in vocabularies
  - Use semantics to align (match) information

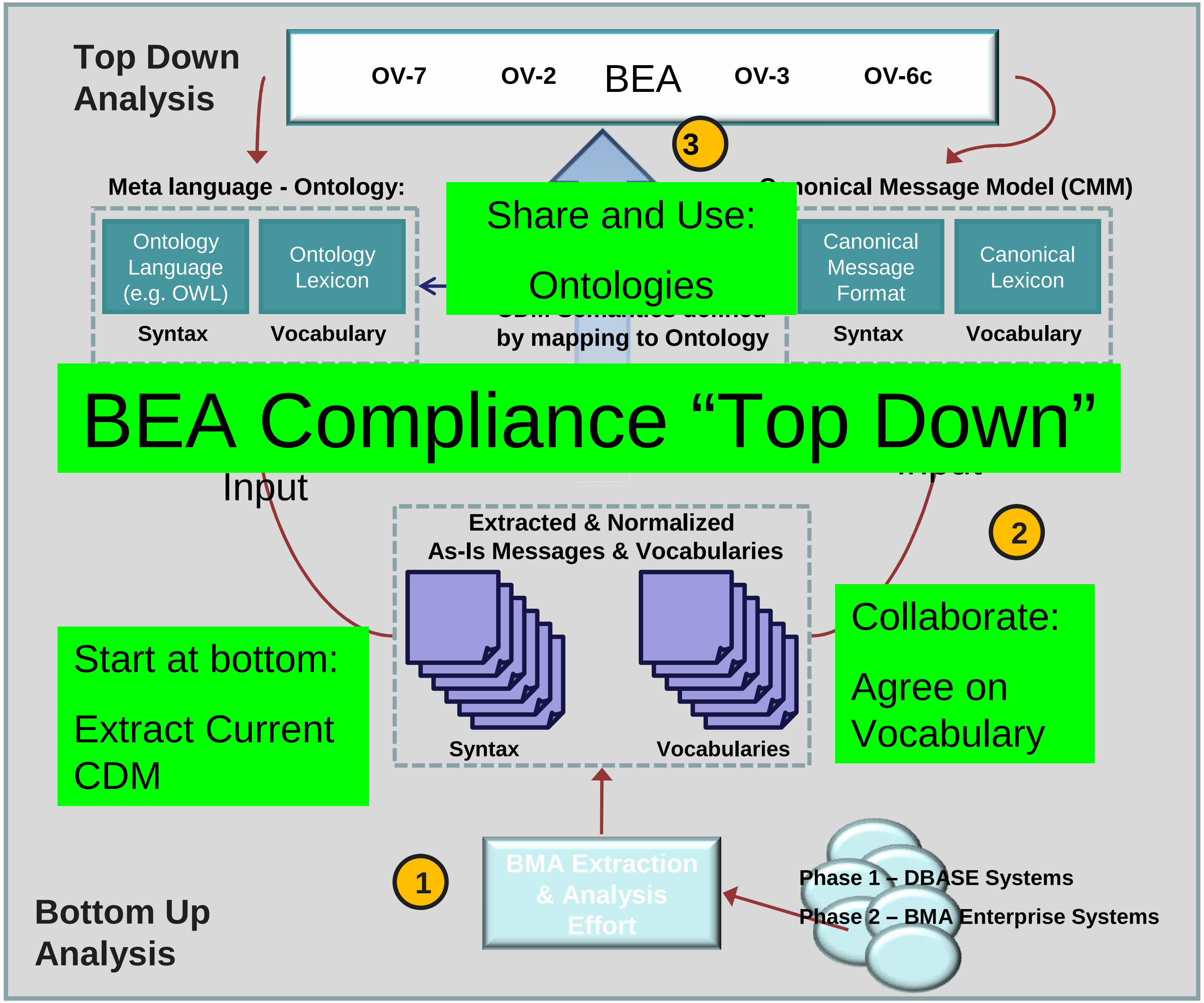
Step 2: Collaborate

- **Creating vocabularies is naturally collaborative**
  - **Tasks: harvest, identify, define, disambiguate, document, standardize, edit, visualize, review, audit and publish**
  - **Involve the right people**
  - **Reuse other vocabularies: benefit from the experts**
- **Community-oriented**
  - **A community consists of members that share experience, expertise and interest in a particular domain**
  - **Communities manage memberships, content, and access privileges**
- **Semantic Wiki**
  - **A wiki is a website that can be edited by users through their browsers**
  - **Captures the efforts of many over time**
  - **Adds semantic richness to wiki markup language**

Step 3: Share and Use

- Machines use ontologies
  - The vocabularies are represented with formalism that are rich and precise enough for software
  - Vocabularies can be downloaded as OWL ontologies
- People use natural language
  - (Most) People don’t understand XML, OWL, RDF, or even HTML
  - People understand text, images, tables, charts, links
  - Follow existing web paradigms that people are comfortable with (browsers, links, pages, addresses, search, discussions, etc.)
- Keep the two parts together
  - People have to understand the vocabulary to maintain and use it
  - If parts are kept separate, more difficult to diverge
  - It’s simply easier this way! (Manually aligning documentation with models is too much work)

Interoperability through Canonical Data Model



Top Down Analysis

OV-7 OV-2 BEA OV-3 OV-6c

③

Meta language - Ontology:

Ontology Language (e.g. OWL)

Ontology Lexicon

Syntax

Vocabulary

Share and Use:

Ontologies

by mapping to Ontology

nonical Message Model (CMM)

Canonical Message Format

Canonical Lexicon

Syntax

Vocabulary

BEA Compliance “Top Down”

Input

②

Extracted & Normalized As-Is Messages & Vocabularies

Syntax

Vocabularies

Start at bottom:

Extract Current CDM

Collaborate:

Agree on Vocabulary

①

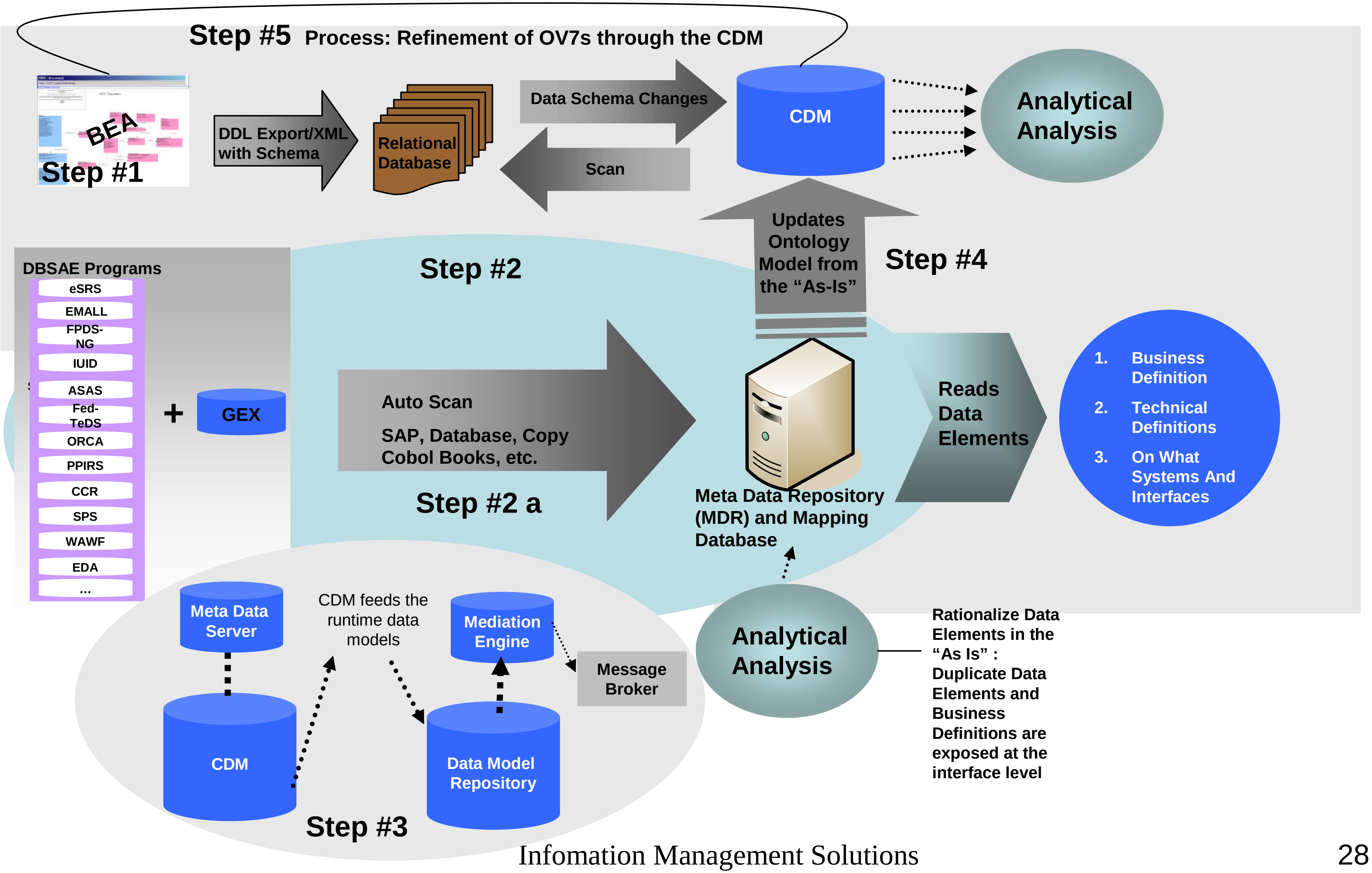
BMA Extraction & Analysis Effort

Phase 1 – DBASE Systems

Phase 2 – BMA Enterprise Systems

Bottom Up Analysis

“To-Be” Architecture Meets “As-Is”



Step #5 Process: Refinement of OV7s through the CDM

BEA

Step #1

DDL Export/XML with Schema

Relational Database

Data Schema Changes

Scan

CDM

Analytical Analysis

Updates Ontology Model from the “As-Is”

Step #4

Step #2

DBSAE Programs
- eSRS
- EMALL
- FPDS-NG
- IUID
- ASAS
- Fed-TeDS
- ORCA
- PPIRS
- CCR
- SPS
- WAWF
- EDA
- ...

+ GEX

Auto Scan

SAP, Database, Copy Cobol Books, etc.

Step #2 a

Meta Data Repository (MDR) and Mapping Database

Reads Data Elements

1. Business Definition
2. Technical Definitions
3. On What Systems And Interfaces

Meta Data Server

CDM feeds the runtime data models

Mediation Engine

Message Broker

CDM

Data Model Repository

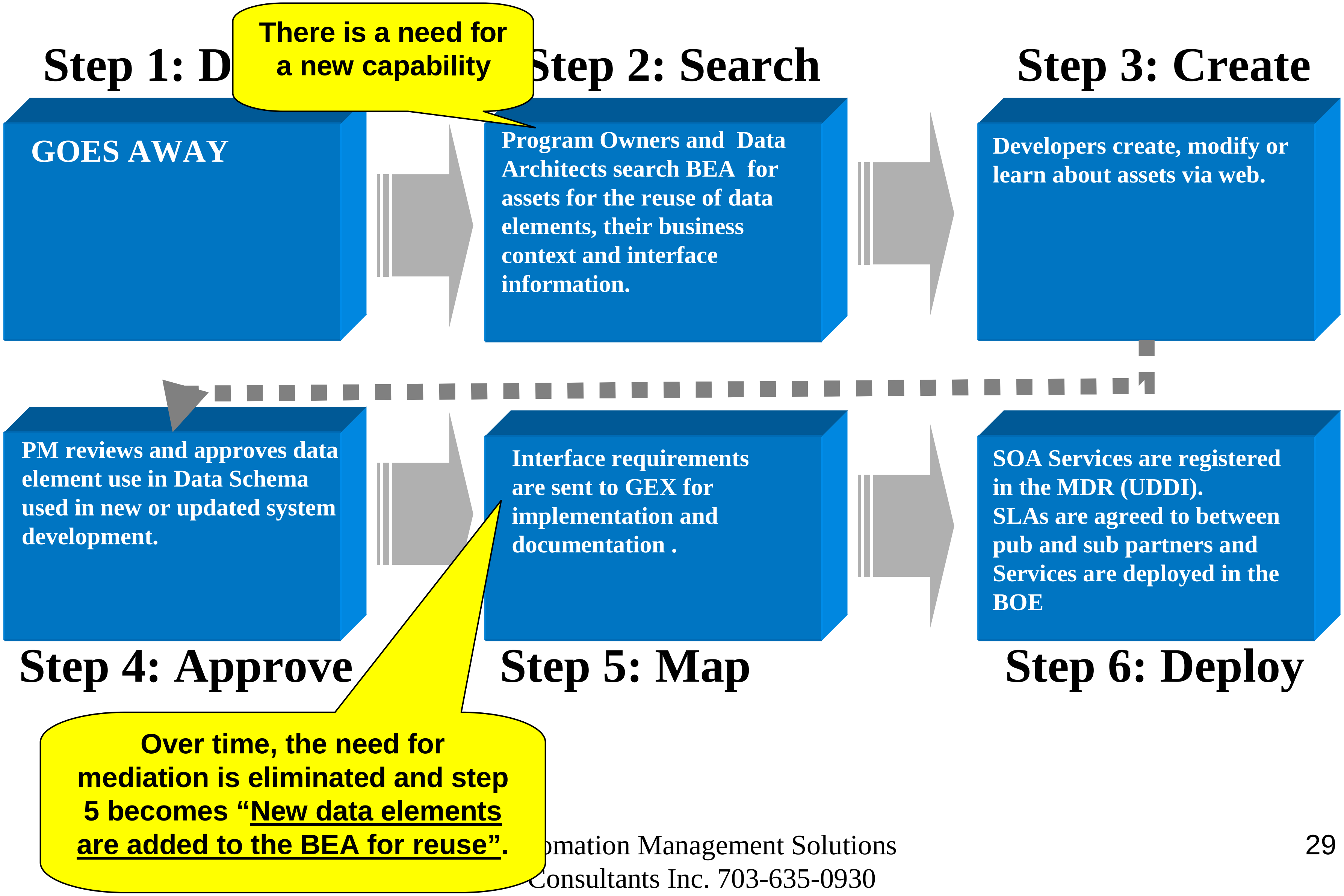
Step #3

Analytical Analysis

Rationalize Data Elements in the “As Is” : Duplicate Data Elements and Business Definitions are exposed at the interface level

Canonical Data Element – Use Process

Search > Create > Approve > Map > Deploy



There is a need for a new capability

Step 1: D

GOES AWAY

Step 2: Search

Program Owners and Data Architects search BEA for assets for the reuse of data elements, their business context and interface information.

Step 3: Create

Developers create, modify or learn about assets via web.

Step 4: Approve

PM reviews and approves data element use in Data Schema used in new or updated system development.

Step 5: Map

Interface requirements are sent to GEX for implementation and documentation .

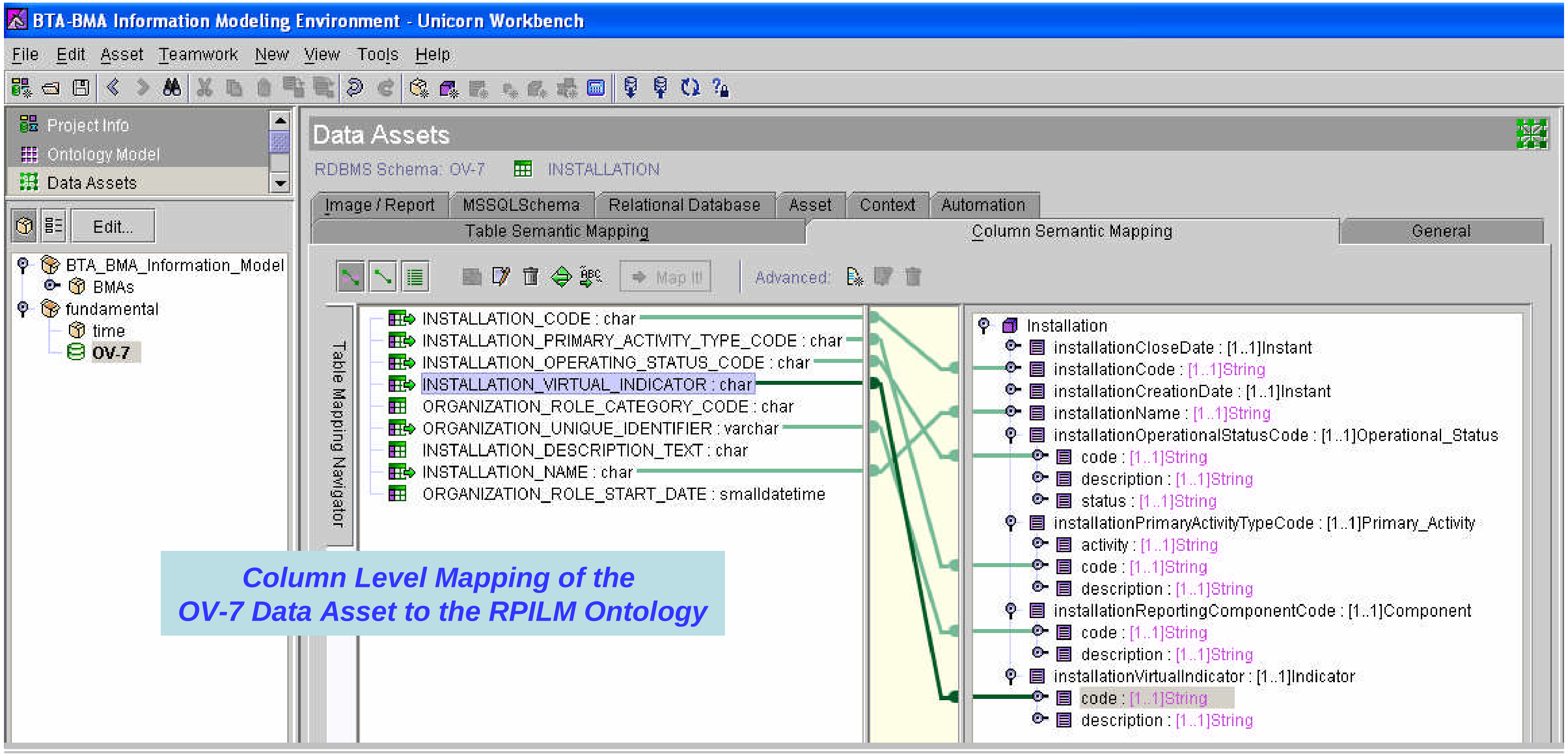
Step 6: Deploy

SOA Services are registered in the MDR (UDDI).
SLAs are agreed to between pub and sub partners and Services are deployed in the BOE

Over time, the need for mediation is eliminated and step 5 becomes "New data elements are added to the BEA for reuse".

Real Life Examples

Mapping COI to the OV-7


BTA-BMA Information Modeling Environment - Unicorn Workbench
File
Edit
Asset
Teamwork
New
View
Tools
Help
Project Info
Ontology Model
Data Assets
Edit...
Data Assets
RDBMS Schema: OV-7
INSTALLATION
Image / Report
MSSQLSchema
Relational Database
Asset
Context
Automation
Table Semantic Mapping
Column Semantic Mapping
General
Map It!
Advanced:
Table Mapping Navigator

BTA_BMA_Information_Model
BMAs
fundamental
time
OV-7

INSTALLATION_CODE : char
INSTALLATION_PRIMARY_ACTIVITY_TYPE_CODE : char
INSTALLATION_OPERATING_STATUS_CODE : char
INSTALLATION_VIRTUAL_INDICATOR : char
ORGANIZATION_ROLE_CATEGORY_CODE : char
ORGANIZATION_UNIQUE_IDENTIFIER : varchar
INSTALLATION_DESCRIPTION_TEXT : char
INSTALLATION_NAME : char
ORGANIZATION_ROLE_START_DATE : smalldatetime

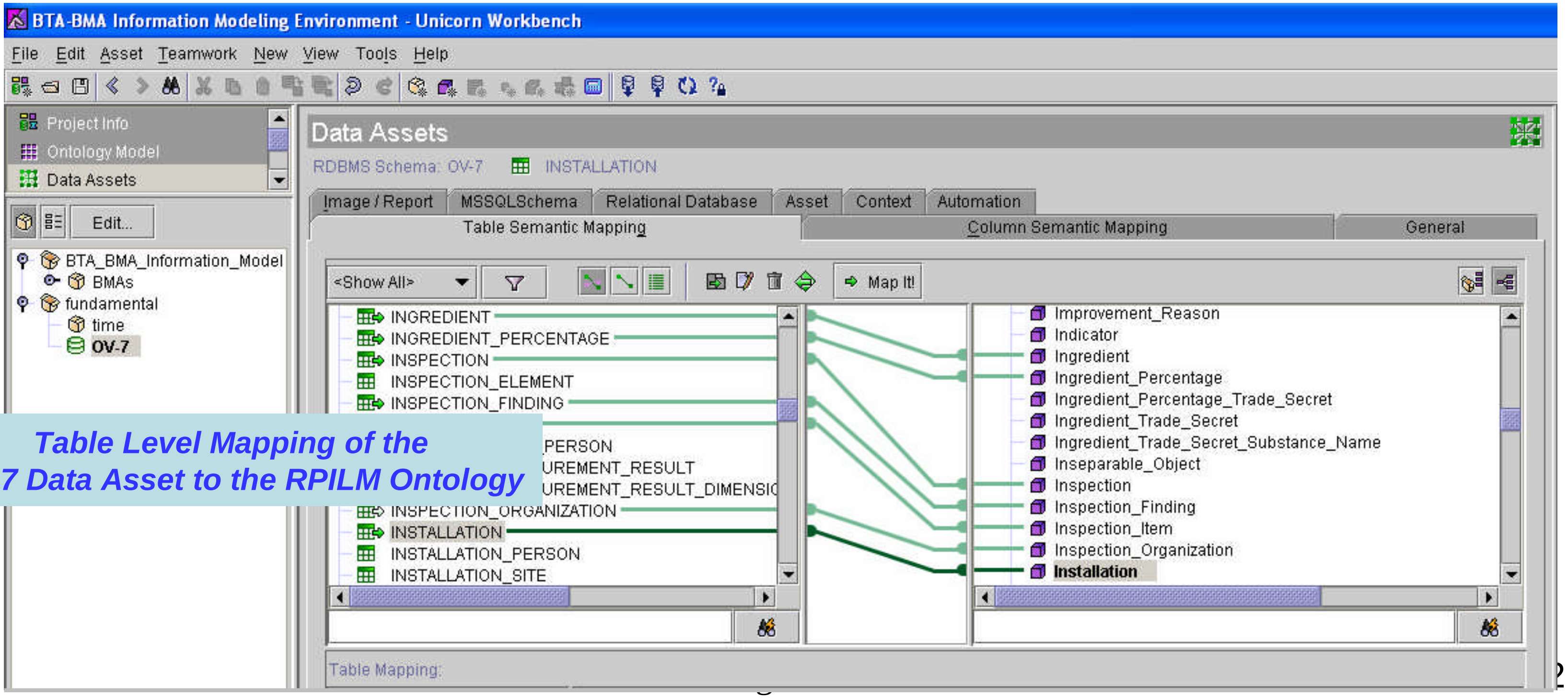
Installation
- installationCloseDate : [1..1]Instant
- installationCode : [1..1]String
- installationCreationDate : [1..1]Instant
- installationName : [1..1]String
- installationOperationalStatusCode : [1..1]Operational_Status
  - code : [1..1]String
  - description : [1..1]String
  - status : [1..1]String
- installationPrimaryActivityTypeCode : [1..1]Primary_Activity
  - activity : [1..1]String
  - code : [1..1]String
  - description : [1..1]String
- installationReportingComponentCode : [1..1]Component
  - code : [1..1]String
  - description : [1..1]String
- installationVirtualIndicator : [1..1]Indicator
  - code : [1..1]String
  - description : [1..1]String

Column Level Mapping of the OV-7 Data Asset to the RPILM Ontology

Using Ontology for Compliance

Using a COTS, map the OV-7 Data Asset to the Real Property and Installations Lifecycle Management Model and determine compliance with the OV-7 Data Asset and completeness of the Model.

➢ The OV-7 Data Asset was mapped to the Ontology at both the Table and Column level to the corresponding Ontology Model Class and Attribute.


BTA-BMA Information Modeling Environment - Unicorn Workbench
File Edit Asset Teamwork New View Tools Help
Project Info
Ontology Model
Data Assets
Edit...
BTA_BMA_Information_Model
BMAs
fundamental
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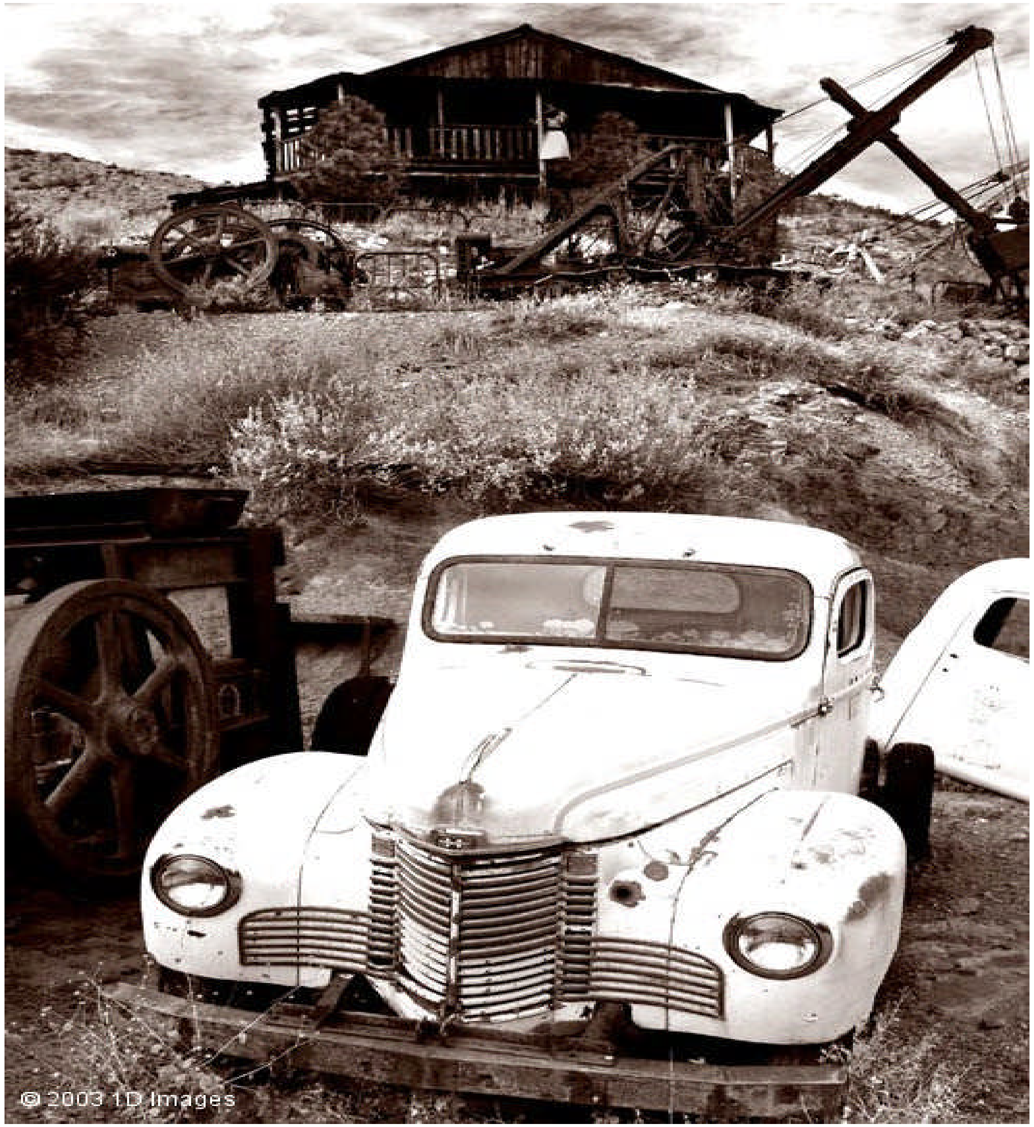
OV-7
Data Assets
RDBMS Schema: OV-7
INSTALLATION
Image / Report
MSSQLSchema
Relational Database
Asset
Context
Automation
Table Semantic Mapping
Column Semantic Mapping
General
<Show All>
Map It!
Table Mapping:

INGREDIENT
INGREDIENT_PERCENTAGE
INSPECTION
INSPECTION_ELEMENT
INSPECTION_FINDING
PERSON
UREMENT_RESULT
UREMENT_RESULT_DIMENSIO
INSPECTION_ORGANIZATION
INSTALLATION
INSTALLATION_PERSON
INSTALLATION_SITE

Improvement_Reason
Indicator
Ingredient
Ingredient_Percentage
Ingredient_Percentage_Trade_Secret
Ingredient_Trade_Secret
Ingredient_Trade_Secret_Substance_Name
Inseparable_Object
Inspection
Inspection_Finding
Inspection_Item
Inspection_Organization
Installation

Table Level Mapping of the OV-7 Data Asset to the RPILM Ontology

"Breaking up is hard to do"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703-635-0930