



SEMANTIC WIKIS

STATUS AND PROSPECTS

AUGUST 1, 2006

PRESENTATION TO:
NCOIC SEMANTIC INTEROPERABILITY WORKSHOP
TYSONS CORNER, VA

FOR NET-CENTRIC DATA SERVICES

MILLS DAVIS
MANAGING DIRECTOR
PROJECT10X
CO-CHAIR, SICOP

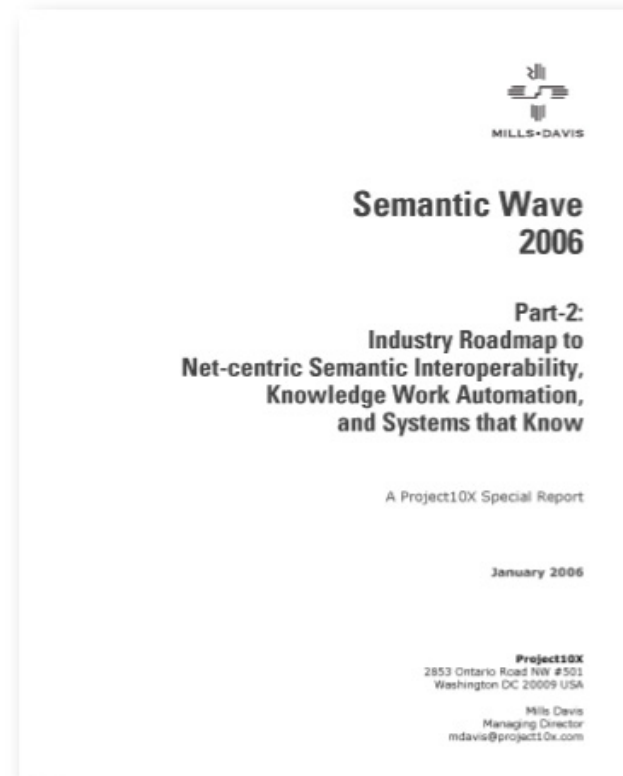
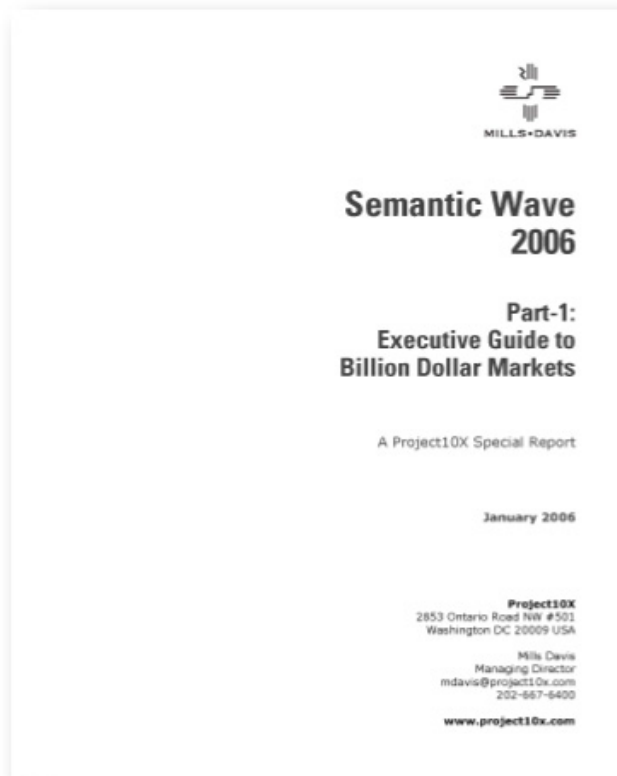
CONOR SHANKEY
CEO
VISUAL KNOWLEDGE
TECHNICAL LEAD,
SICOP/SWIM

SO, WHAT HAPPENS WHEN YOU
HAVE LOTS OF *WEB*, LOTS OF
SEMANTICS, & LOTS OF
SOCIAL INTERACTION WITH IT?



SEMANTIC WAVE 2006:

**FIRST COMPREHENSIVE STUDY OF BUSINESS APPLICATIONS
AND MARKETS FOR SEMANTIC TECHNOLOGIES**



([HTTP://WWW.SEMANTIC-CONFERENCE.COM/SEMANTICWAVE.HTML](http://www.semantic-conference.com/semanticwave.html))

MILLS DAVIS

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- MILLS DAVIS IS **PROJECT10X**'S FOUNDER AND MANAGING DIRECTOR FOR INDUSTRY RESEARCH AND STRATEGIC PROGRAMS. HE CONSULTS WITH TECHNOLOGY MANUFACTURERS, GLOBAL 2000 CORPORATIONS, AND GOVERNMENT AGENCIES ON NEXT-WAVE SEMANTIC TECHNOLOGIES AND SOLUTIONS.
- MILLS SERVES AS CO-CHAIR OF THE FEDERAL CIO COUNCIL'S **SEMANTIC INTEROPERABILITY COMMUNITY OF PRACTICE** (SICOP) WHERE HE LEADS RESEARCH INTO THE BUSINESS VALUE OF SEMANTIC TECHNOLOGIES AND THE SEMANTIC WIKIS FOR INFORMATION MANAGEMENT (SWIM) WORKING GROUP. ALSO, MILLS IS A FOUNDING MEMBER OF THE AIIM **INTEROPERABLE ENTERPRISE CONTENT MANAGEMENT** (IECM) WORKING GROUP, AND A FOUNDING MEMBER OF THE NATIONAL CENTER FOR ONTOLOGY RESEARCH (NCOR).
- A NOTED RESEARCHER AND INDUSTRY ANALYST, MILLS HAS AUTHORED MORE THAN 100 REPORTS, WHITEPAPERS, ARTICLES, AND INDUSTRY STUDIES.

CONOR SHAKEY

604-730-0086 CSHANKEY@VISUALKNOWLEDGE.COM

- FOUNDER & CEO OF **VISUAL KNOWLEDGE**, 15 YEARS.
- ARCHITECTED **LARGEST** CORPORATE WAN/LAN OF IT'S KIND OUTSIDE US IN 1990
- ARCHITECTED ENTERPRISE TRANSACTIONAL FRAME SYSTEM TO SUPPLEMENT/REPLACE **MISSION CRITICAL** MAINFRAME SYSTEMS OF LARGE POWER UTILITY
- CTO/CO-FOUNDER OF SEVERAL SPIN-OUT COMPANIES FROM VISUAL KNOWLEDGE
- CO-FOUNDER **CLERA PHARMACEUTICALS**, SMALL ANTI-PSYCHOTIC DRUG DISCOVERY COMPANY
- NCOR TECHNICAL COMMITTEE, CHAIR OF 2006 OWL WORKSHOP (INTL SEMANTIC WEB CONFERENCE)

TOPICS

- FEDERAL INFORMATION SHARING
- SICOP/SWIM
- NCOIC PILOT TEST SCENARIO USING A COMMUNITY OF INTEREST **SEMANTIC WIKI** TO ENABLE INFORMATION SHARING THROUGH NET-CENTRIC DATA SERVICES
- DEMO OF SEMANTIC WIKI CAPABILITIES

**FEDERAL
INFORMATION
SHARING**

CURRENT SITUATION

- ANNUAL SPENDING ON IT BY THE FEDERAL GOVERNMENT IS APPROACHING **\$70 BILLION**. ACROSS GOVERNMENT AGENCIES, THERE EXIST MILLIONS OF WEB PAGES, DATABASES, DOCUMENT REPOSITORIES, FILE SYSTEMS, AND RECORDS ARCHIVES.
- FOR FEDERAL AGENCIES, DISCOVERY, UNDERSTANDING, AND SHARING OF INFORMATION ACROSS ORGANIZATIONAL BOUNDARIES, LINES OF BUSINESS, AND FUNCTIONS PRESENT A **MONUMENTAL CHALLENGE** SINCE INFORMATION SHARING ACTIVITIES ARE **FRAGMENTED**, ACROSS MULTIPLE AGENCIES, INFORMATION AREAS, AND STANDARDS INITIATIVES.
- FEDERAL AGENCIES SPONSOR AND PARTICIPATE IN A **MULTIPLICITY** OF PROGRAMS THAT TARGET SHARING OF INFORMATION INTERNALLY AND EXTERNALLY, E.G.: DOD, INTELLIGENCE COMMUNITY, DHS, HHS, DOC.
- SEVERAL AGENCIES HAVE **CROSS-AGENCY MISSIONS** REQUIRING RECORD, DOCUMENT, AND INFORMATION SHARING, E.G.: OMB, GSA, GPO, NARA.

POLICY GUIDANCE

- CONGRESSIONAL LEGISLATION, PRESIDENTIAL POLICIES, AND AGENCY DIRECTIVES ESTABLISH REQUIREMENTS TO CATEGORIZE AND SHARE INFORMATION ACROSS ORGANIZATIONAL BOUNDARIES WITH CITIZENS, BUSINESS ORGANIZATIONS, AND OTHER AGENCIES OF GOVERNMENT **AT ALL LEVELS, BOTH DOMESTIC AND INTERNATIONAL.**
- OFFICE OF MANAGEMENT AND BUDGET (OMB) GUIDANCE REGARDING THE SHARING OF INFORMATION REQUIRES AGENCIES TO: (A) **HARMONIZE** DATA RESOURCES, (B) **CATEGORIZE** THEM FOR DISCOVERY, (C) **EXPOSE** THEM AS SERVICES FOR SHARING, AND (D) **PUBLISH** AUTHORITATIVE INFORMATION THAT WILL ENABLE OTHER AGENCIES, LEVELS OF GOVERNMENT, INDUSTRY, INTERESTED PARTIES, AND THE PUBLIC TO FIND, ACCESS, AND UNDERSTAND THIS INFORMATION.
- AGENCIES ARE INSTRUCTED AND **GRADED** ON HOW WELL THEY IMPLEMENT INFORMATION SHARING THAT IS CONSISTENT WITH THE POLICY GUIDANCE AND DATA REFERENCE MODEL (DRM) SET FORTH IN THE FEDERAL ENTERPRISE ARCHITECTURE.

KEY ROLE OF COMMUNITIES OF INTEREST

- INFORMATION SHARING POLICY GUIDANCE FOR CIVILIAN AND DEFENSE AGENCIES LAYS EMPHASIS ON **COMMUNITIES OF INTEREST** (COIS) AS A MEANS TO **HARMONIZE** RELATED AREAS OF INFORMATION ACROSS ORGANIZATIONAL BOUNDARIES AND TO STAND UP COMMON SERVICES FOR INFORMATION SHARING.
- A COMMUNITY OF INTEREST IS A CROSS-ORGANIZATION, CROSS-BUSINESS LINE, AND CROSS-FUNCTION GROUP OF **INFORMATION PRODUCERS AND CONSUMERS** THAT NEEDS TO SHARE INFORMATION TO ACCOMPLISH SOME MISSION, BUSINESS, OR SOCIAL PURPOSE. AN EXAMPLE WOULD BE A COMMUNITY OF INTEREST RELATING TO GEO-SPATIAL INFORMATION.
- BY DEFINITION, MEMBERS OF COMMUNITIES OF INTEREST ARE **COLLABORATIVE BODIES** THAT DO NOT REPORT THROUGH A COMMON MANAGEMENT AND ADMINISTRATIVE STRUCTURE. FOCUSING ON COMMUNITIES OF INTEREST RECOGNIZES THE IMPORTANCE **SOCIAL AGREEMENTS** AND SHARED MEANINGS (SEMANTICS) FOR EFFECTIVE INFORMATION SHARING.

KEY CHALLENGES

- HOW DO WE DEAL WITH THE NEED FOR SEMANTIC **INTEROPERABILITY** OF SYSTEMS AND INFORMATION?
- HOW DO WE **EMPOWER** COMMUNITIES OF INTEREST WITH COST-EFFECTIVE COLLABORATION ENVIRONMENTS, GOVERNANCE PROCESSES, AND LIFECYCLE KNOWLEDGE MANAGEMENT TO ENABLE THEIR WORK?
- HOW DO WE **KNIT TOGETHER** THE WORK OF VARIOUS COMMUNITIES TO ENABLE A LARGER FABRIC OF **COST-EFFECTIVE** FEDERAL INFORMATION SHARING AND ACCESS TO EMERGE?

SICOP/SWIM

SEMANTIC INTEROPERABILITY
COMMUNITY OF PRACTICE/*SEMANTIC WIKI*
FOR INFORMATION MANAGEMENT
WORKING GROUP

SICOP/SWIM POINT OF DEPARTURE

- INFORMATION SHARING IS A **TECHNO-SOCIAL** PROCESS.
- SHARED UNDERSTANDING (SEMANTIC INTEROPERABILITY) EMERGES **ORGANICALLY** AND IS SUSTAINED THROUGH ACTIVE INVOLVEMENT OF INTERESTED COMMUNITIES.
- APPROACHES TO INFORMATION SHARING DIRECTED TOP-DOWN HAVE BEEN TRIED REPEATEDLY **AND HAVE FAILED TO ACHIEVE THE DESIRED RESULT.**
- GOAL OF SICOP/SWIM IS TO **EMPOWER** COMMUNITIES OF INTEREST WITH COLLABORATIVE TOOLING AND BEST PRACTICES TO: (A) BUILD **TRUSTED** REFERENCE KNOWLEDGE, (B) STAND-UP SERVICES THAT **ENABLE** INFORMATION SHARING ACROSS ORGANIZATIONAL BOUNDARIES, AND (C) **MANAGE** THE ENTIRE LIFECYCLE OF THIS ACTIVITY.

SICOP/SWIM STRATEGY

- **SUPPORT COMMUNITY OF INTEREST INFORMATION SHARING INITIATIVES.**
- **PILOT TEST** SEMANTIC WIKIS AS A LIGHT-WEIGHT, EASILY USED, AND EXTENSIBLE ENVIRONMENT FOR CROSS-ORGANIZATIONAL AND COMMUNITY OF INTEREST COLLABORATION, INFORMATION SHARING, KNOWLEDGE MANAGEMENT, AND SHARED SERVICE DEVELOPMENT.
- HELP **DEVELOP SEMANTIC MODELS** AND **MODELS-OF-MODELS** TO BETTER INTERRELATE, ALIGN AND HARMONIZE STANDARDS EFFORTS BEING DEVELOPED AND USED BY DIFFERENT COMMUNITIES.

NCOIC

PILOT TEST SCENARIO

COMMUNITY OF INTEREST
SEMANTIC WIKI FOR
INFORMATION SHARING
THROUGH NET-CENTRIC
DATA SERVICES

DOD NET-CENTRIC DATA STRATEGY

Government Executive Panel
NDIA Net-Centric Operations Conference
March 13-16, 2006

Transforming the Way the DoD Manages Data

An Army Officer recently observed,
"The Global Information Grid (GIG) exists to connect people with information"

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Director, Information Management
OASD(NII) DoD CIO
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March 14, 2006

Barriers to Identifying, Accessing and Understanding Data

Defining The Data Problem

End-User Consumer

"What data exists?"
"How do I access the data?"
"How do I know this data is what I need?"
"How can I tell someone what data I need?"

End-User Producer

"How do I share my data with others?"
"How do I describe my data so others can understand it?"

BARRIER BARRIER BARRIER BARRIER

Organization "A"

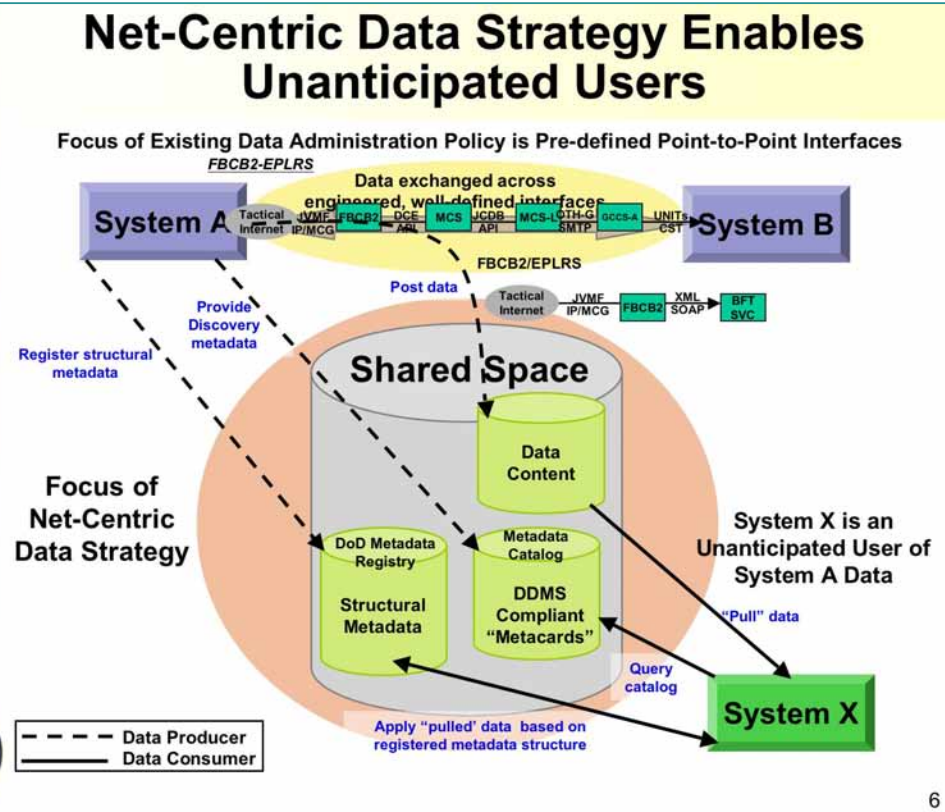
Data Strategy Approach: Discovery Metadata

Organization "B"

Data Strategy Approach: Web Enabling, Web-service Enabling

Organization "C"

Data Strategy Approach: COIs, Metadata Registry

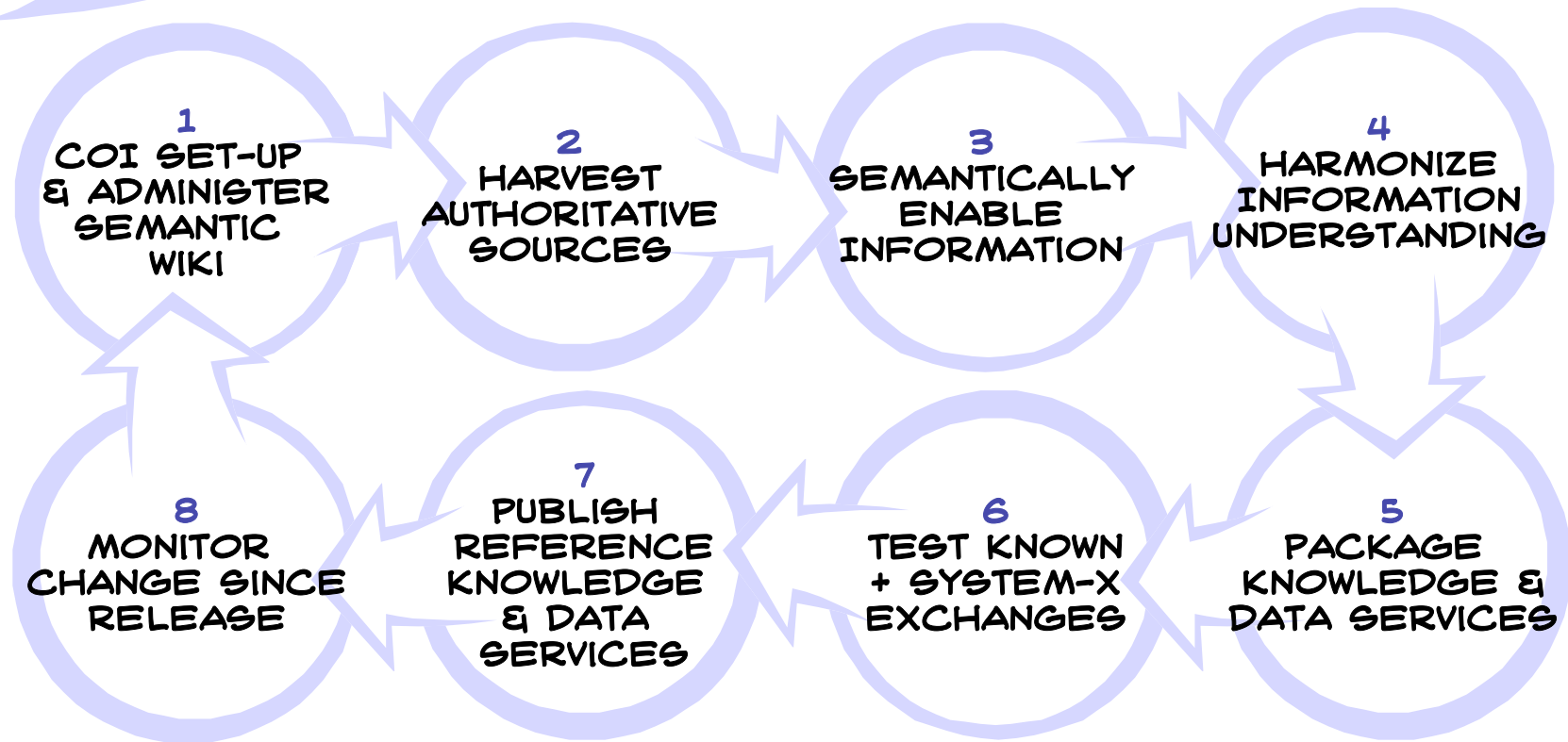


DOD NET-CENTRIC DATA STRATEGY

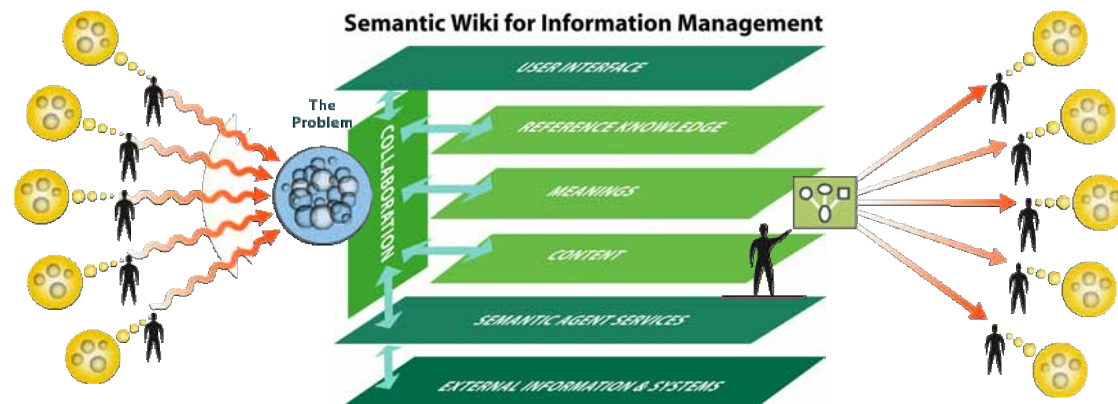
<p>What is a COI?</p> <ul style="list-style-type: none"> COIs are described in the DoD Net-Centric Data Strategy A COI is ... <ul style="list-style-type: none"> a <i>Community</i> Of people who are all interested in something and need to share information What does a COI do? <ul style="list-style-type: none"> Work together to resolve the issues that affect their community Establish community standards on how information will be exchanged within the COI What can't a COI do? <ul style="list-style-type: none"> COIs do not operate systems or provide services COIs do not submit POMs COIs do not direct changes to ICIDs, ORDs, CDDs, or CPDs <p><i>However, members of COIs do!</i></p>	<p>Pilot Scope</p> <p>Scope:</p> <ol style="list-style-type: none"> What programs of records or other sources will advertise data as a web-service IAW the agreed COI vocabulary? What value-added services will be demonstrated? What network(s) will be used to demonstrate net-centric capabilities? What joint exercise(s) will be used to demonstrate net-centric capabilities? What organizations are participating? 	<p>COI Pilot Systems Architecture</p> <p>GS COI Blue Force Current + 18 Hours Service UDOP (DRAFT)</p>
<p>Sample COI Organization Chart</p> <p>FOR DISCUSSION PURPOSES ONLY</p>	<p>COI Pilot POA&M</p> <p>High-level Graphic with dependencies, decision points, and final demonstrated illustrated.</p>	<p>COI Pilot Metrics</p> <p>Metrics to assess the return on investment (ROI) (resources as well as net-centric capabilities and agility) of the pilot.</p> <p>Start-point:</p> <ol style="list-style-type: none"> Changes and impact to Programs of Record (POR) involved in the COI Pilot Initial and incremental costs of web service interfaces to advertise Program of Record (POR) data User assessment of demonstrated net-centric capabilities Feedback on ease of use and adoption of CES pilot services Level of effort to agree on initial COI vocabulary

SEMANTIC WIKI SCENARIO:

**COI DEVELOPS & PUBLISHES REFERENCE KNOWLEDGE
AND DATA SERVICES FOR NET-CENTRIC
INFORMATION SHARING**



1. SET-UP AND ADMINISTER THE SEMANTIC WIKI



COLLABORATION

IDENTITIES
ROLES
CAPABILITIES
PROCESSES
APPEARANCE
SECURITY
GOVERNANCE

COI GOVERNANCE

EXECUTIVE IN CHARGE
STEERING GROUP
CORE TEAM
GOVERNANCE
DECISION PROCESS,
CRITERIA
PLAN + SCHEDULE

COI PARTICIPANTS

INVITE TO JOIN
SIGN-UP + PROFILE
ROLE
SECURITY

2. HARVEST AUTHORITATIVE SOURCES

HARVEST

POLICY GUIDANCE

STANDARDS

SCHEMAS + MODELS

DOCUMENTATION

SYSTEM, DATA, AND
KNOWLEDGE

ARTIFACTS

AUTHOR + EDIT

WIKI PAGES

EMAIL

DOCUMENTS

PRESENTATIONS

3. SEMANTICALLY ENABLE INFORMATION

SEMANTIC

CONCEPTS

RELATIONSHIPS

BEHAVIORS

RULES

ENABLEMENT

DISCOVER

EXTRACT

SELECT

ANNOTATE

ENHANCE

SEARCH

NAVIGATE

CAPABILITY

MANUAL

SEMI-AUTOMATIC
(ITERATIVE)

AUTOMATIC

4. HARMONIZE INFORMATION UNDERSTANDING

ANALYZE

IDENTIFY, MAP, &
CHARACTERIZE DATA,
INFORMATION, AND
KNOWLEDGE ELEMENTS

ANALYZE SYNTACTICAL,
STRUCTURAL, AND SEMANTIC
RELATIONS

IDENTIFY CONFLICTS,
OVERLAPS, SIMILARITIES,
ACROSS INFORMATION
SOURCES

HARMONIZE

ALIGN AND INTERLINK TERMS
AND MODELS

PROPOSE RECONCILED TERMS,
RELATIONSHIPS, AND SEMANTIC
MODELS.

REVIEW, VET DIFFERENCES,
REACH AGREEMENTS

5. PACKAGE KNOWLEDGE & DATA SERVICES

DEFINE

DISCOVERY METADATA

ACCESS SERVICES

SEMANTICS FOR
UNDERSTANDING DATA ASSETS

MODELS AND DIRECTORY
FORMATS

NET-CENTRIC DATA SERVICES

REVIEW

VERIFY REQUIREMENTS MET
FOR NET-CENTRIC DATA
SERVICES PACKAGE

6. TEST KNOWN & SYSTEM-X EXCHANGES

PILOT TEST KNOWN EXCHANGE

PUBLISH REFERENCE KNOWLEDGE AND DATA SERVICES TO TEST ENVIRONMENT

TEST EXCHANGES INVOLVING KNOWN PRODUCERS AND CONSUMERS OF INFORMATION

EVALUATE AND REVISE AS NEEDED

PILOT TEST SYSTEM-X EXCHANGE

PUBLISH REFERENCE KNOWLEDGE AND DATA SERVICES TO TEST ENVIRONMENT

TEST SCENARIO(S) FOR INFORMATION SHARING WITH AUTHORIZED BUT UNANTICIPATED USER WHERE SYSTEM-X DISCOVERS, ACCESSES, UNDERSTANDS, AND CAN UTILIZE EXPOSED INFORMATION IN THE CONTEXT OF ITS OWN COMPOSITE APPLICATION

EVALUATE AND REVISE AS NEEDED

7. PUBLISH APPROVED REFERENCE KNOWLEDGE & DATA SERVICES

REVIEW & APPROVE

**SUBMIT REFERENCE
KNOWLEDGE, DATA
SERVICES, AND TESTING
RESULTS FOR REVIEW
AND APPROVAL**

FINALIZATION

AUTHORIZATION

DEPLOY

**PUBLISH LATEST VERSION OF
REFERENCE KNOWLEDGE
AND DATA SERVICES TO NET-
CENTRIC DIRECTORIES AND
TO WIKI.**

8. MONITOR CHANGE SINCE RELEASE

MONITOR

MONITOR SOURCES

**AUTO-DETECT CHANGES
TO REFERENCE
KNOWLEDGE AND
INFORMATION SOURCES**

INITIATE ACTION

**ASSESS SCOPE AND
IMPACT OF CHANGE**

**INITIATE CHANGE
MANAGEMENT PROCESS**

SEMANTIC WIKI SCENARIO: REVIEW CHECKLIST



SEMANTIC WIKI

DEMO

REFERENCES

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