

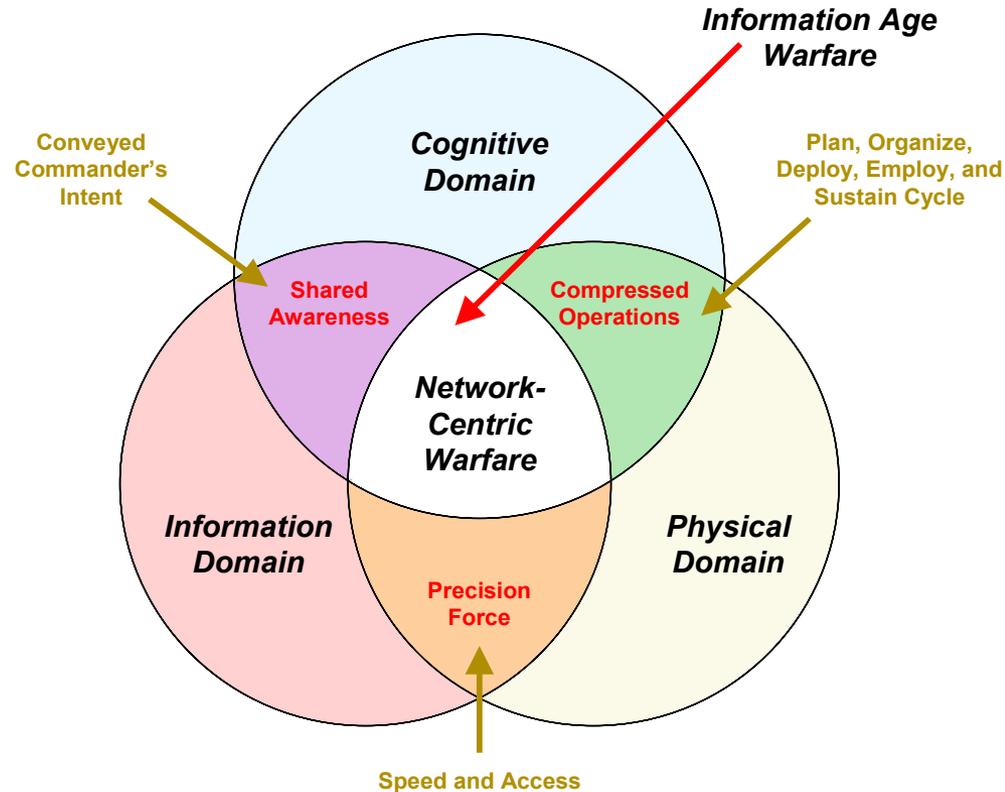


Net-Centric Information Management

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13 June 2005

Net-Centric Warfare

- **Seamless interoperability**
 - The network is only the beginning!
- **Permits sharing of**
 - Information
 - Situational awareness
 - Commander's intent
- **Leading to**
 - Speed of command
 - Self-synchronization
 - Enemy lock-out
- **Producing increased combat power**



NCW: Creating A Decisive Advantage
ASD/NIJ, Office of Force Transformation

Net-Centric Information Management



**The
Net-Centric
Future**

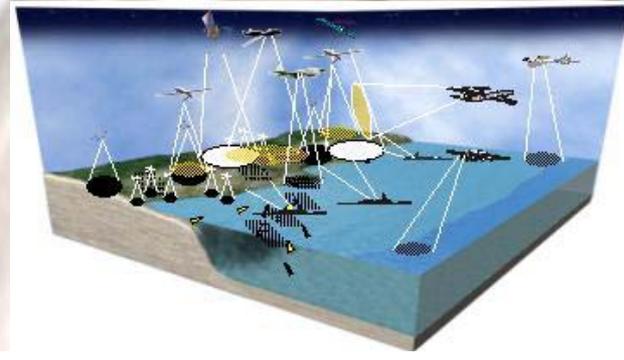
The Fortune Teller's Predictions

① Seamless network connectivity



The Fortune Teller's Predictions

- ① Seamless network connectivity
- ② Very many network participants



Expeditionary Sensor Grid
>10K distributed,
networked sensors

The Fortune Teller's Predictions

- ① Seamless network connectivity
- ② Very many network participants
- ③ **Bandwidth limits at the sharp end**



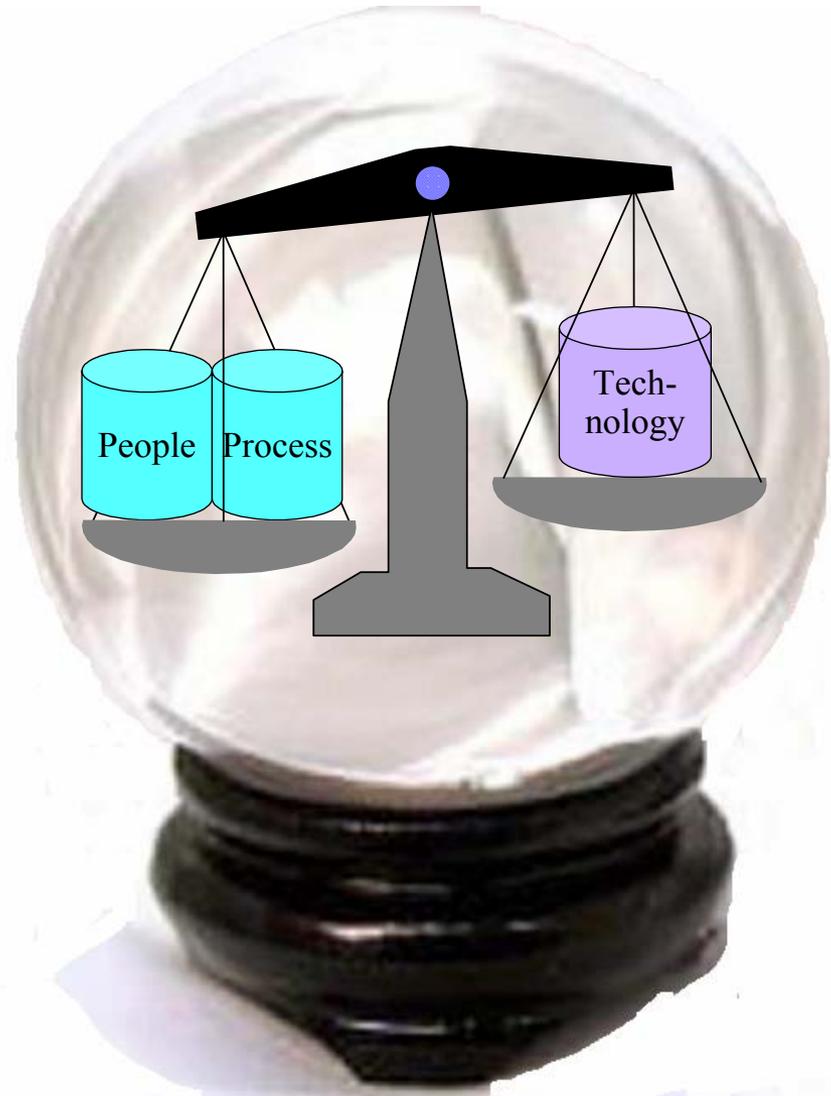
The Fortune Teller's Predictions

- ① Seamless network connectivity
- ② Very many network participants
- ③ Bandwidth limits at the sharp end
- ④ **Information assurance still crucial**



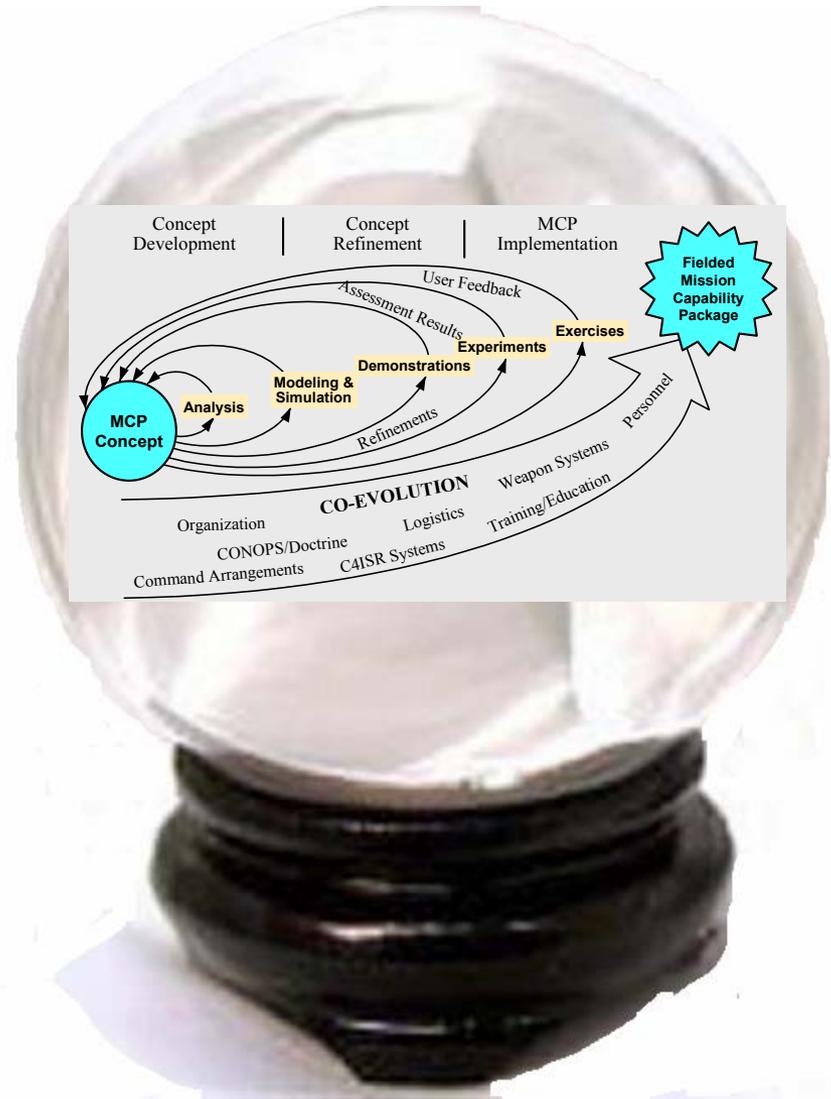
The Fortune Teller's Predictions

- ① Seamless network connectivity
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- ④ Information assurance still crucial
- ⑤ **Advantage comes from best use of IT**



The Fortune Teller's Predictions

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- ⑥ Flexibility essential for quick coevolution



Implications for Net-Centric IM

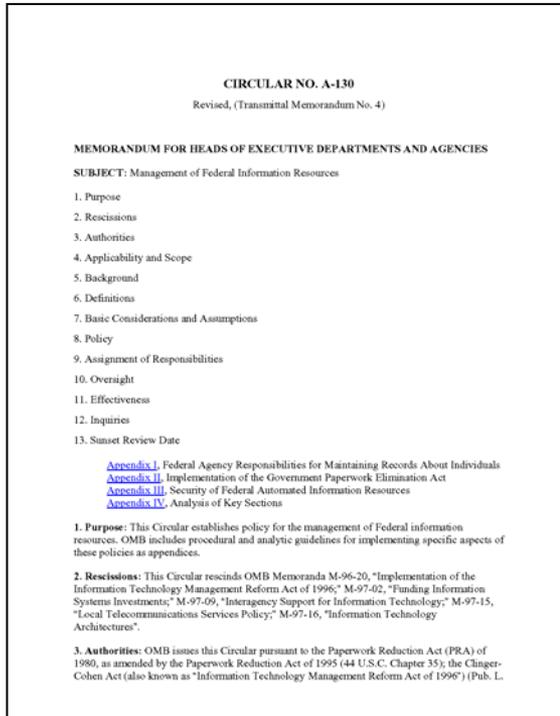
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Implications For Net-Centric IM

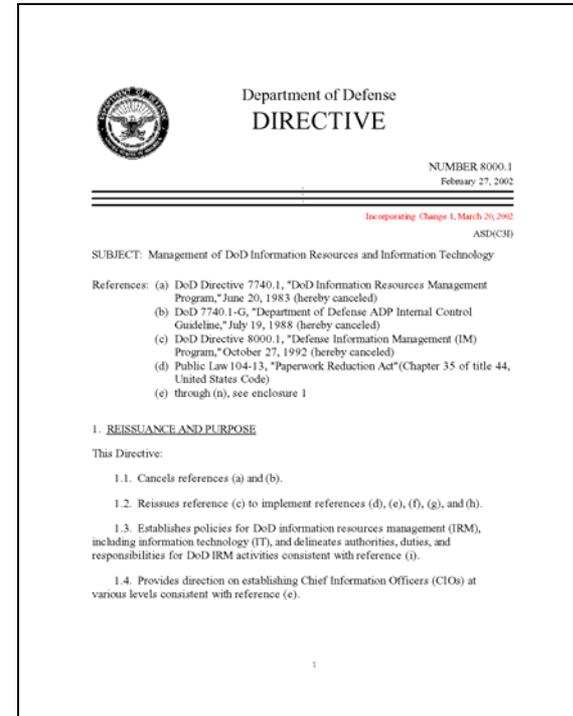
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 - ⑤ Advantage comes from best use of IT
 - ⑥ Flexibility essential for quick coevolution
- End of pairwise arrangements
 - For semantics
 - For information flows
 - For access control
 - Shared semantics
 - Aligned to doctrine, training
 - Not one big data model
 - Not everyone does own thing
 - Pedigree
 - Trust
 - Authoritative source
 - Information preplanning
 - Accountable data owners

Information Management, Officially Defined



OMB Circular A-130 Management of Federal Information Resources

*Requires Federal agencies to
develop enterprise architectures*



DoD Directive 8000.1 Management of DoD Information Resources

*Establishes the DoD and
Component CIOs*

Information Management, Officially Defined

OMB Circular A-130 and DoD Directive 8000.1
boil down to the same definitions

- **Information = data**
- **Information management :**

Planning, budgeting, manipulating, controlling of information throughout its lifecycle: creation / collection, processing, dissemination, use, storage, and disposition

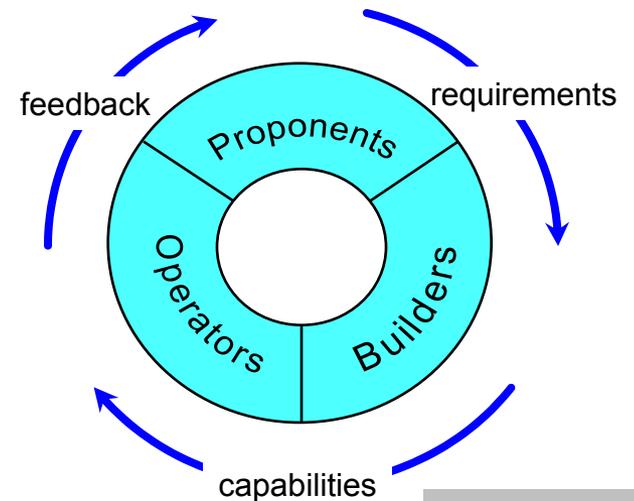
- **These IM tasks apply to all information / data**
 - **Combat operations, combat support, and business data**
 - **Data for machine processing and human presentation**
 - **Not just records, documents, content**

Information Management, Officially Defined

Information Management:

Planning, budgeting, manipulating, controlling of information throughout its lifecycle: creation / collection, processing, dissemination, use, storage, and disposition

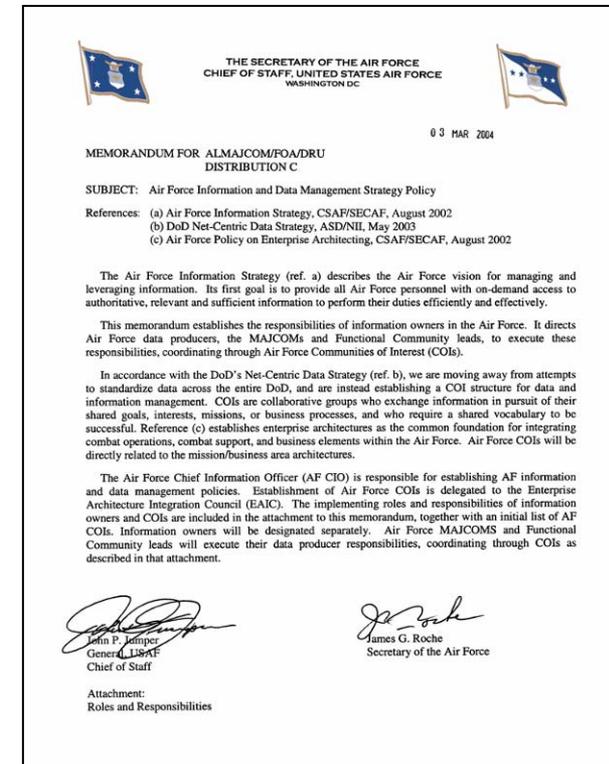
- Note that proponents, builders, users all have a role in IM
 - Proponents: define the processes to be supported
 - Builders: construct systems to support process
 - Operators / users: employ system to conduct process



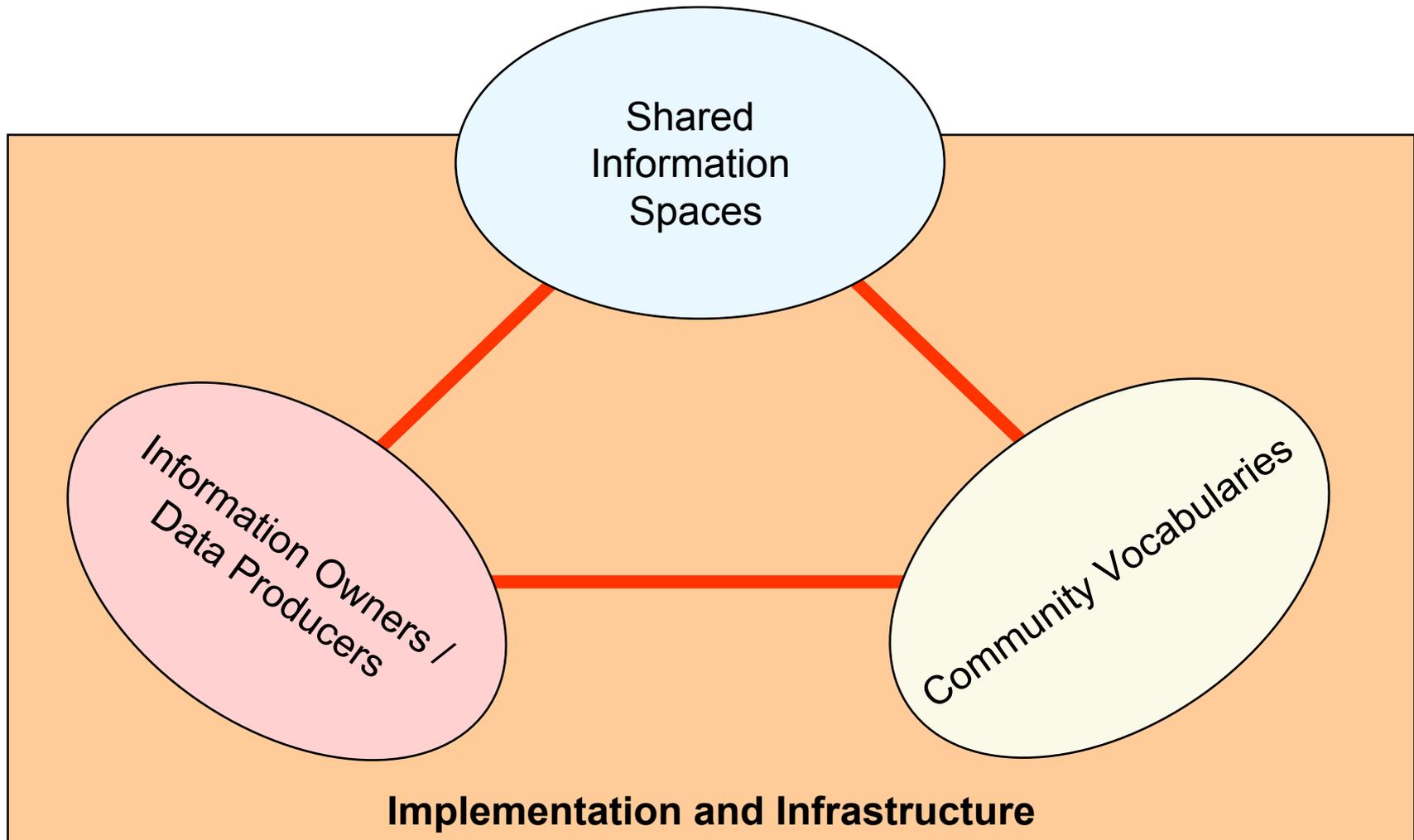
Require,
Build, Operate
(RBO) Loop

AF Information and Data Management Strategy

- Purpose of the strategy is to provide people the right data at the right time and place so that they can make the right decisions
- Goals: Make sure the right data
 - Exists
 - Can be discovered
 - Can be understood
 - Is accessible
- Policy memo defines roles and responsibilities
 - Information owners
 - Communities of Interest (COIs)



AF Information & Data Mgt. Strategy: The “Triangle Foundation”



Shared Information Spaces

Shared Information Space

Consumers and the information they need

Validated info needs, driven by CONOPS and TTP

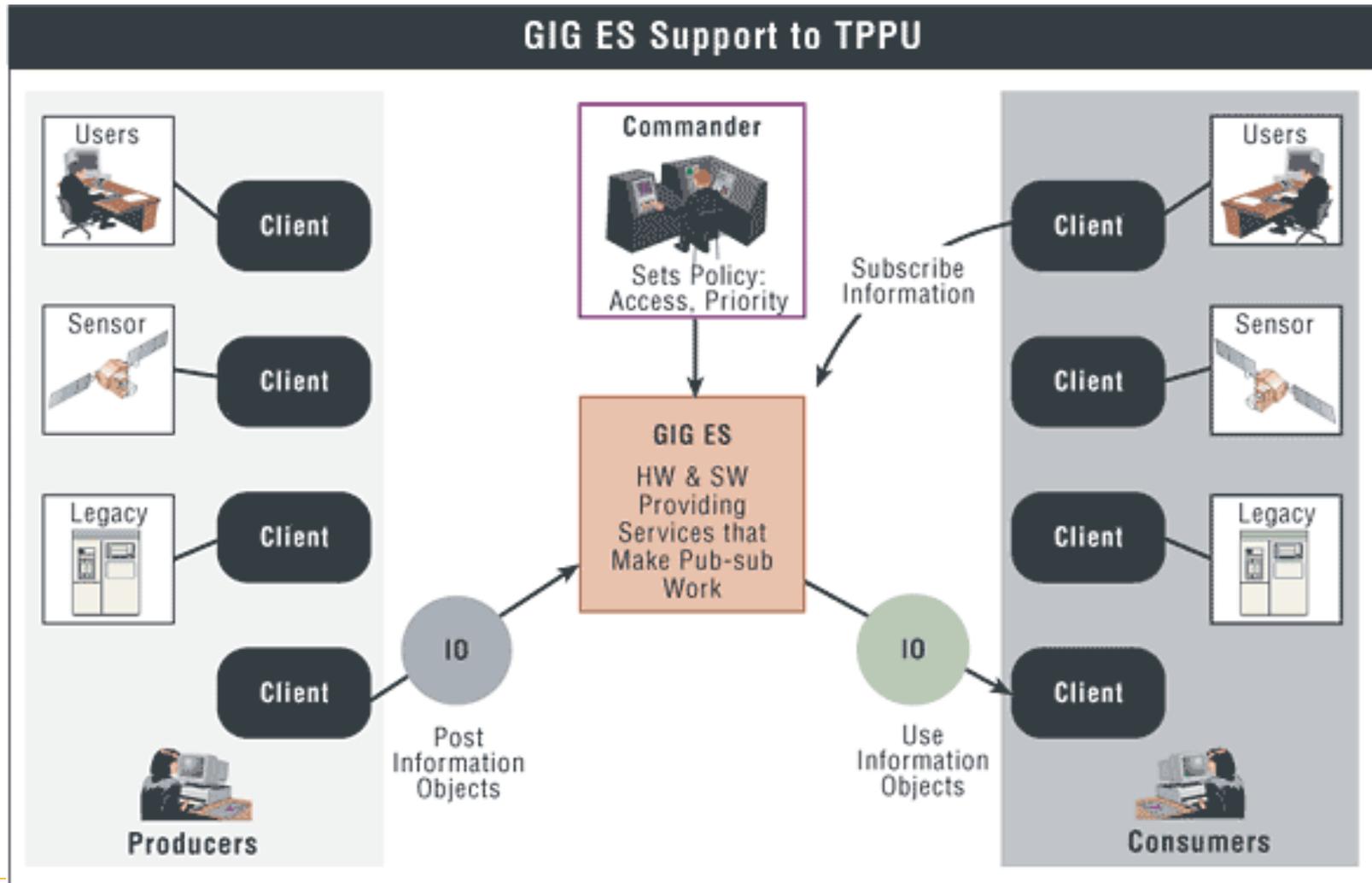
Designated authoritative sources meeting requirements

Access control (users, roles, permissions)

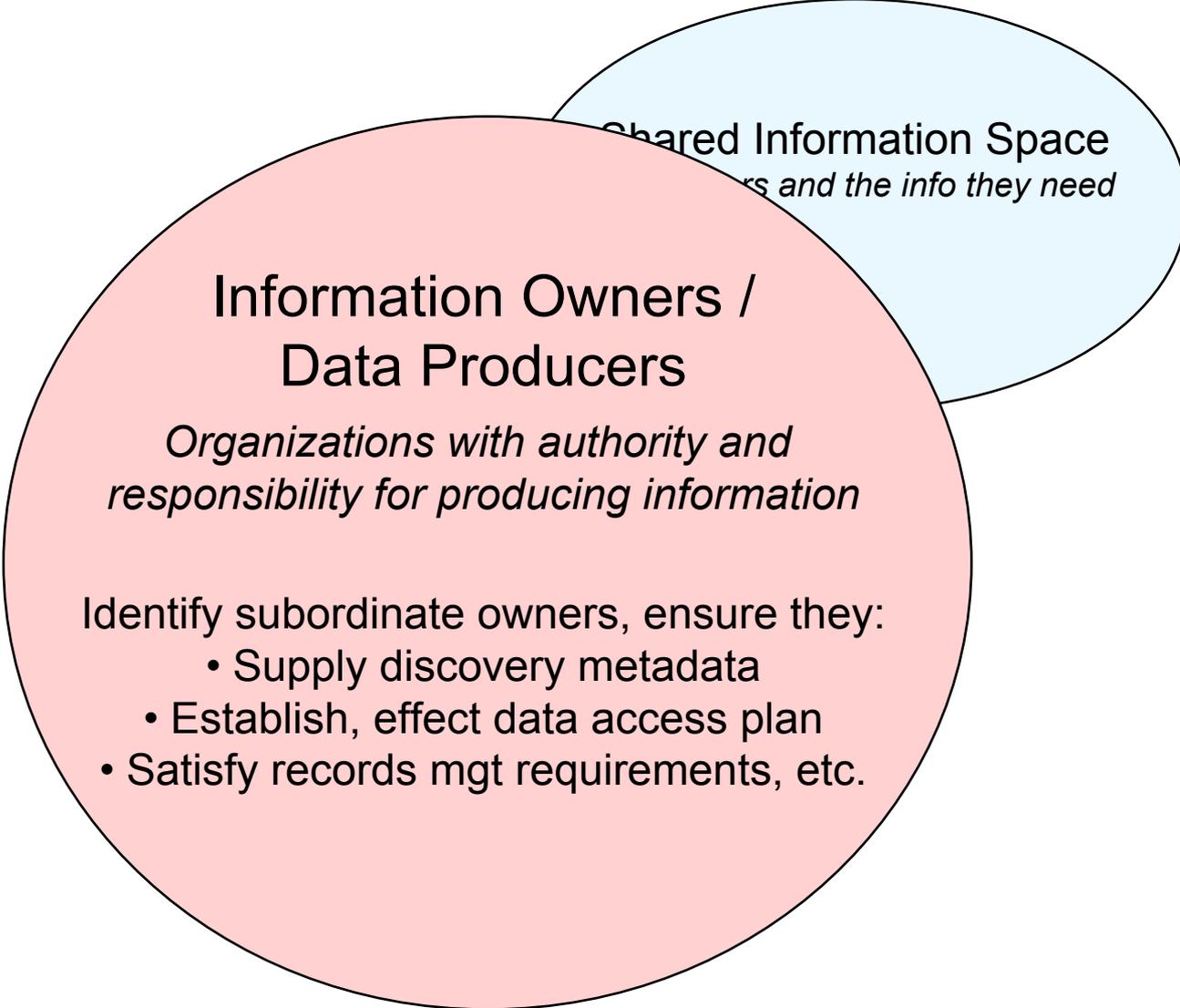
Priority and Quality of Service

Controlling authority

Task, Post, Process, Use (TPPU): An Infospace and Controlling Authority



Information Owners



The diagram consists of two overlapping circles. The left circle is pink and contains the text 'Information Owners / Data Producers' and a list of responsibilities. The right circle is light blue and contains the text 'Shared Information Space' and 'Users and the info they need'. The intersection of the two circles is the area where the two sets of text meet.

Information Owners / Data Producers

*Organizations with authority and
responsibility for producing information*

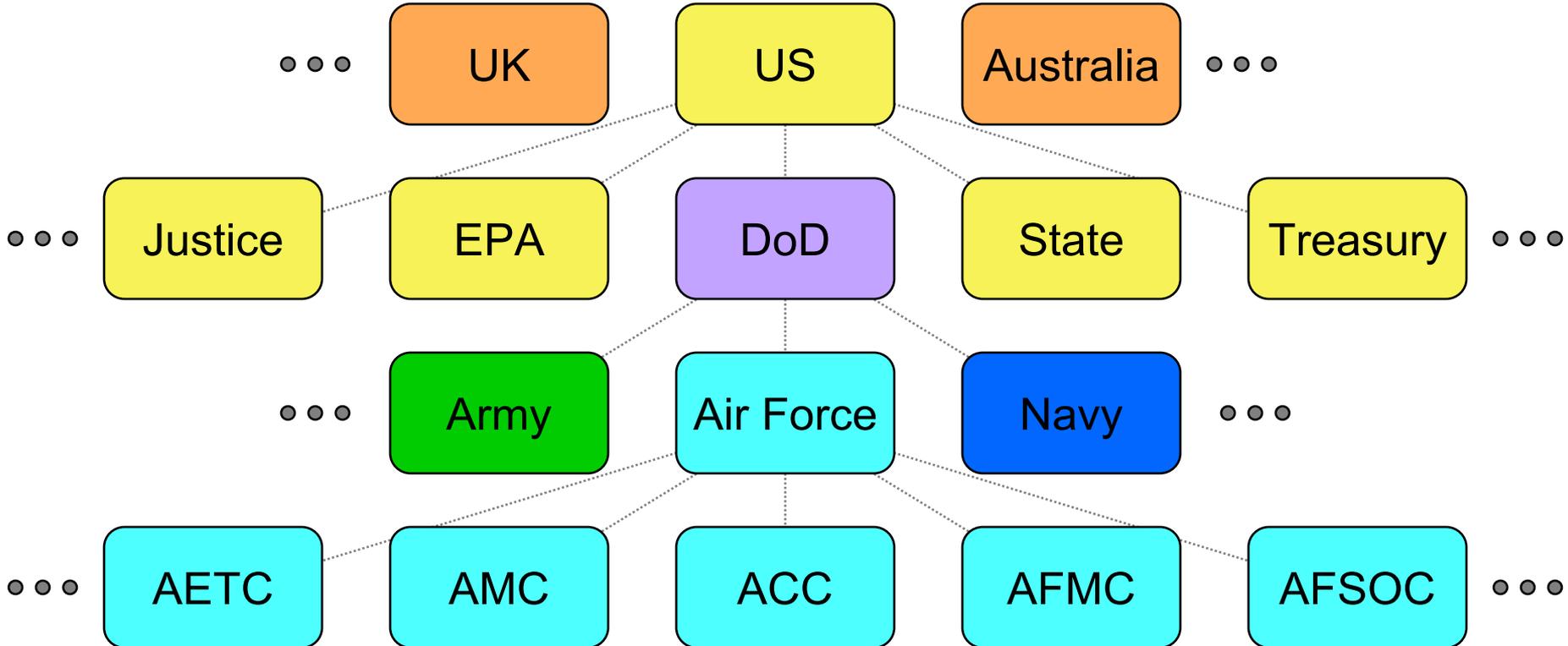
Identify subordinate owners, ensure they:

- Supply discovery metadata
- Establish, effect data access plan
- Satisfy records mgt requirements, etc.

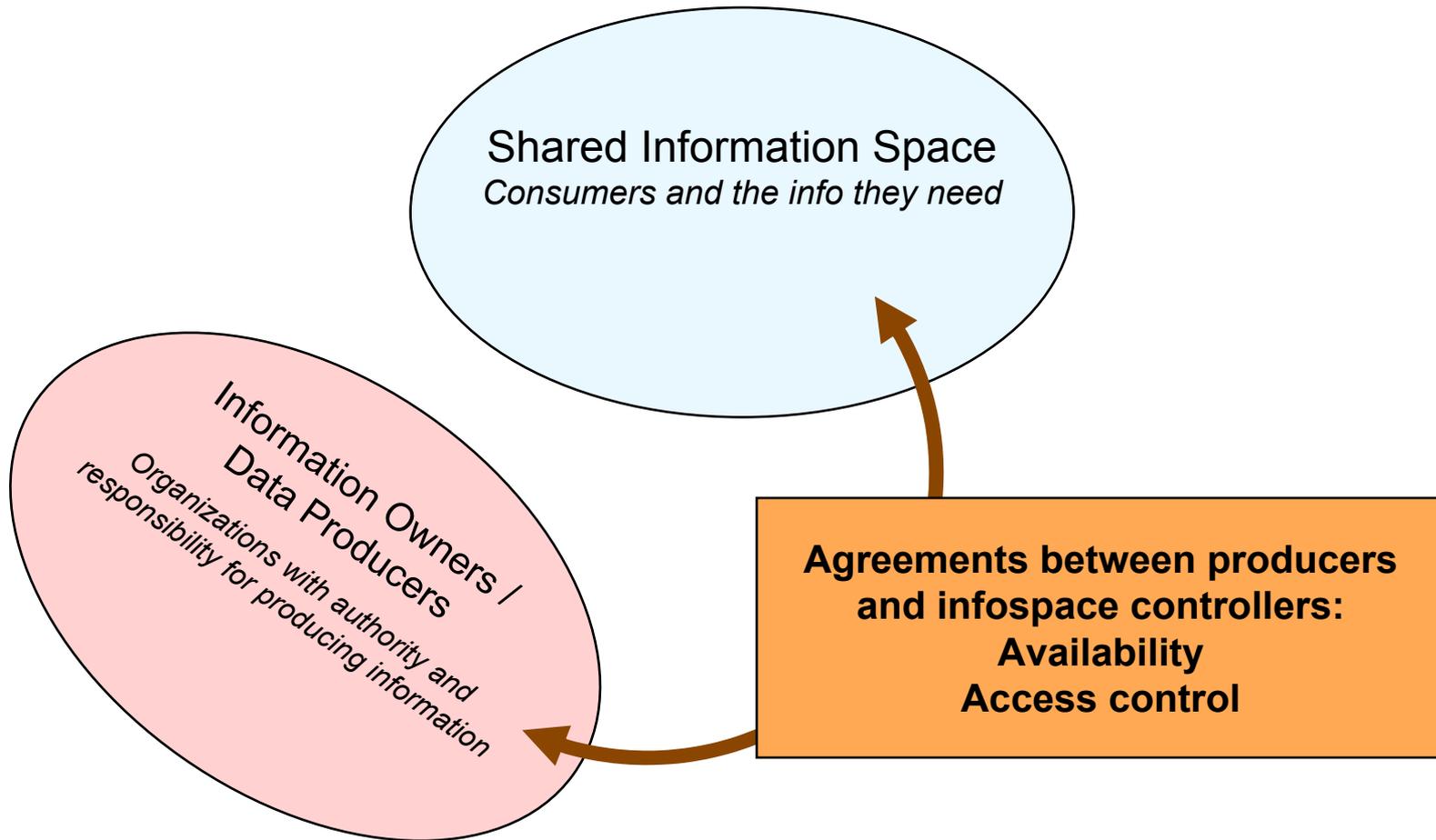
Shared Information Space
Users and the info they need

The Enterprise: Subordinates and Partners

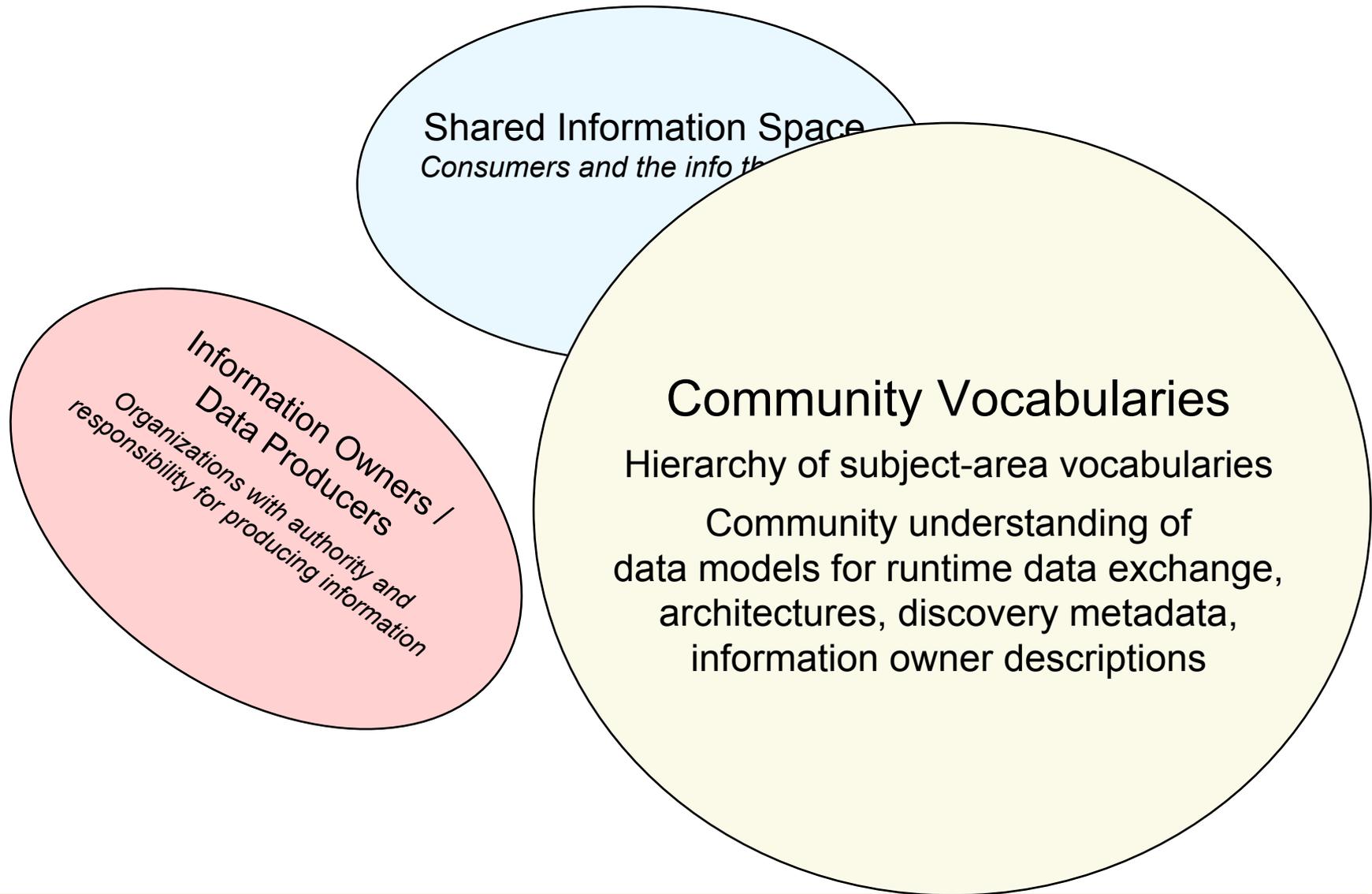
You can't just say "all information is owned by the enterprise"



Data Service Agreements Are Required



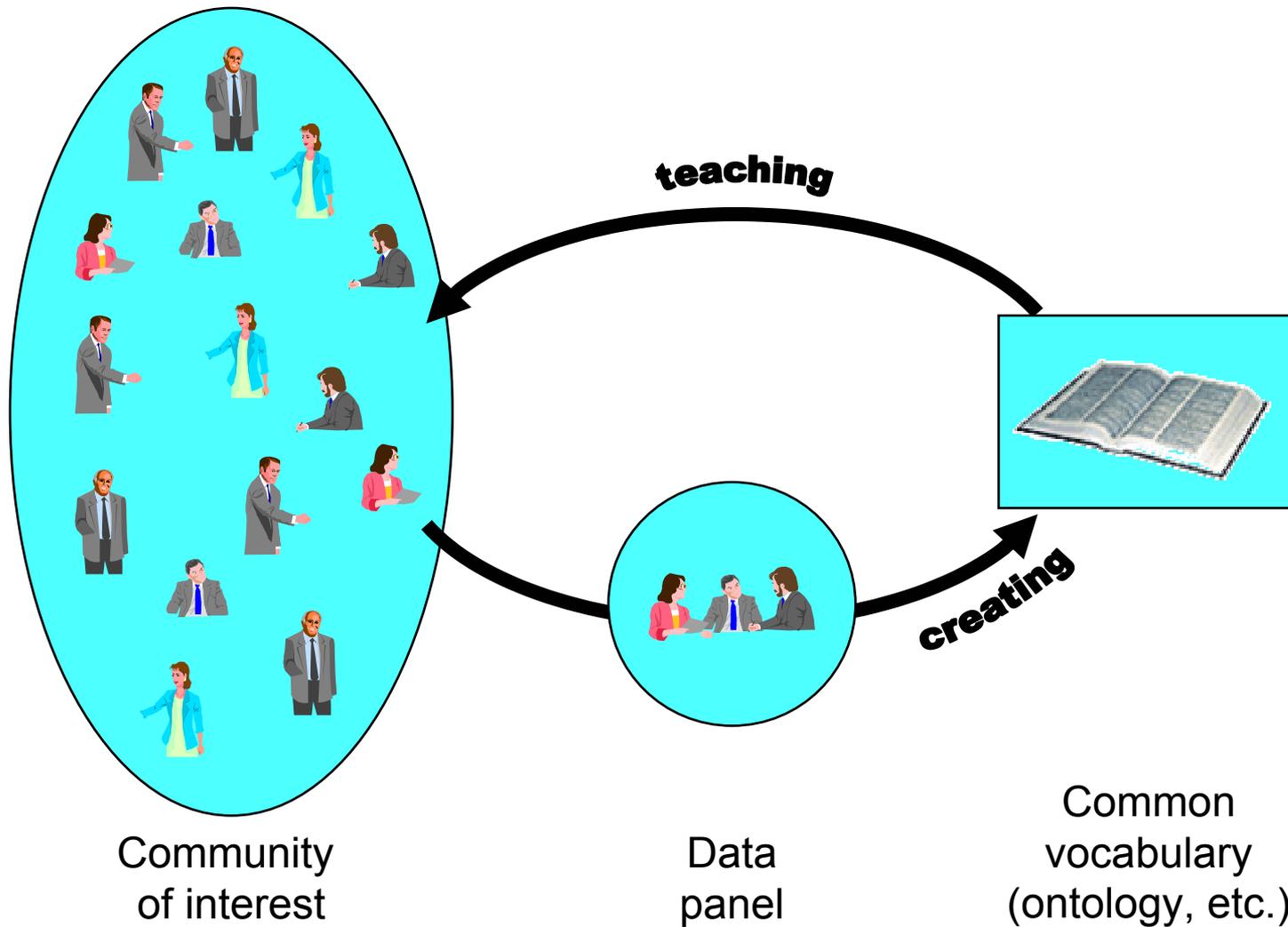
Community Vocabularies



Community Vocabularies

- **Why “community vocabularies”? Why not talk about**
 - Data models
 - Data elements
 - Schemas
 - Taxonomies
 - Ontologies
 - Other formal methods to capture / share semantics
- **We need shared semantics for several purposes**
 - Data definitions for programmers and users
 - Metadata “tags” for discovery
 - Information description in architecture products
- **We use “vocabulary” to subsume all of those formalisms for all of those purposes**

Vocabulary Is Knowledge

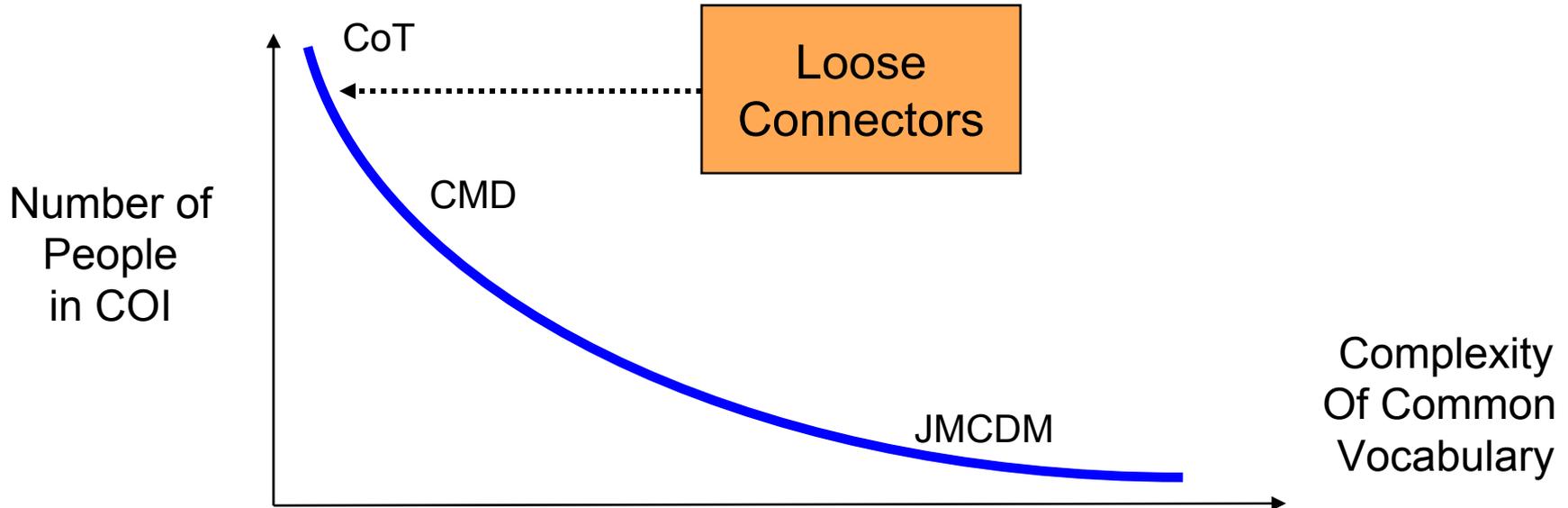


The Power Law of Common Vocabularies

- We should expect a range between:
 - A small number of broad, shallow vocabularies: few definitions, understood by many people
 - A larger number of narrow, deep vocabularies: many definitions, understood by few people

CoT

JMCDM
Joint METOC
Conceptual
Data Model



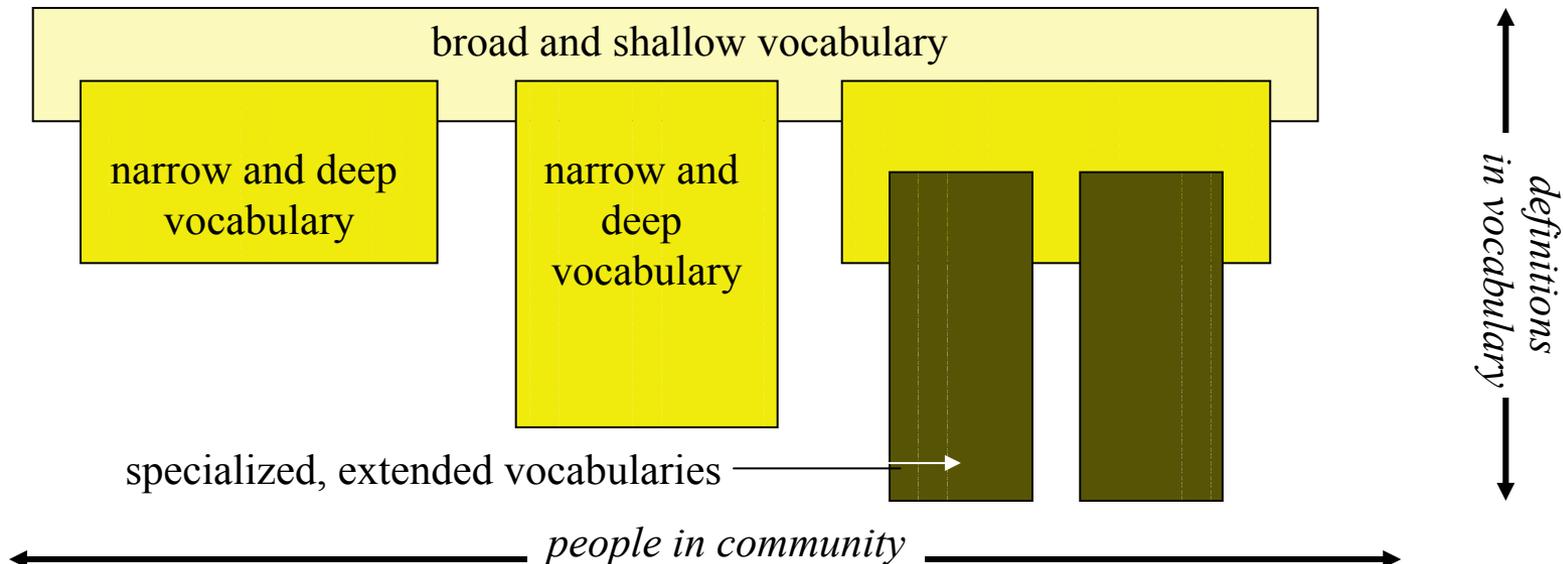
The Power Law of Common Vocabularies

■ We should expect a range between:

- A small number of broad, shallow vocabularies: few definitions, understood by many people
- A larger number of narrow, deep vocabularies: many definitions, understood by few people
- Eventually, deep vocabularies will extend and specialize the shallow vocabularies

CoT

JMCDM
Joint METOC
Conceptual
Data Model



Implementation Infrastructure

Shared Information Space
Consumers and the info they need

Information Owners /
Data Producers
*Organizations with authority
responsibility for producing*

Community Vocabularies
*Subject-area vocabularies
models for data exchange,
discovery metadata*

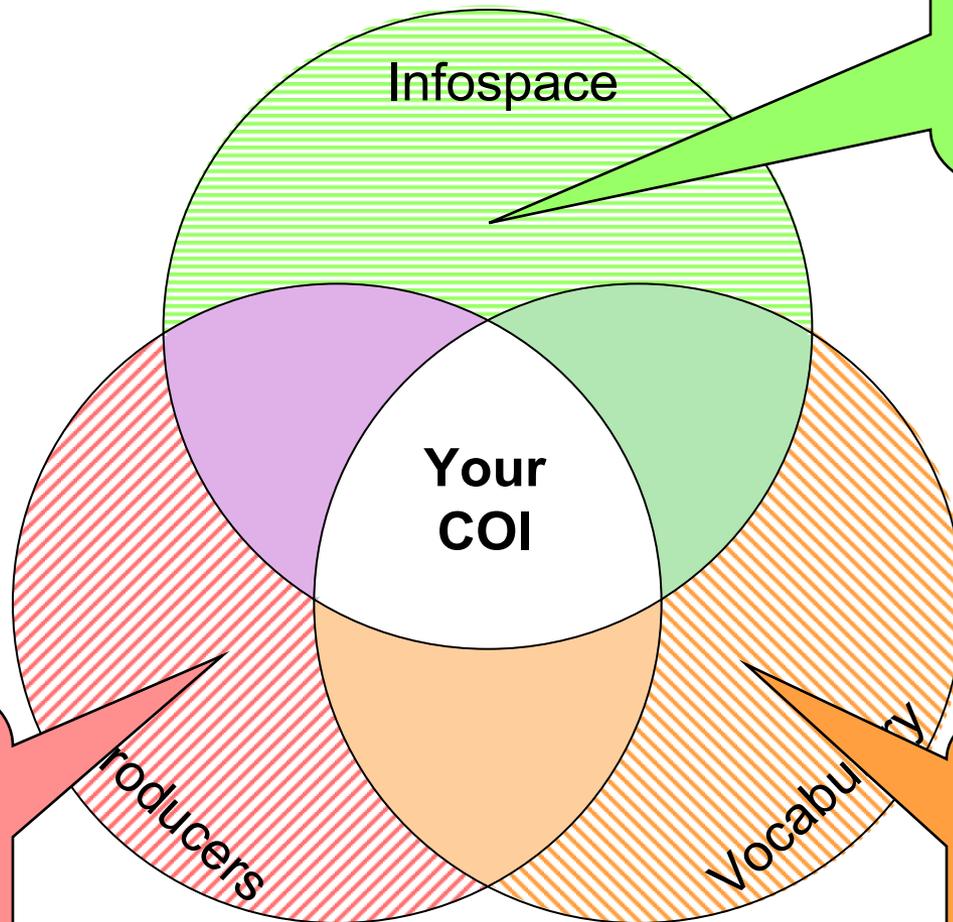
Implementation and Infrastructure

Data access implementation (warehouse, pub/sub, web service, portal, etc.)

Physically located at producers, consumers, or someplace in between.

Core services for identity, authentication, etc.

Expanding To The Enterprise

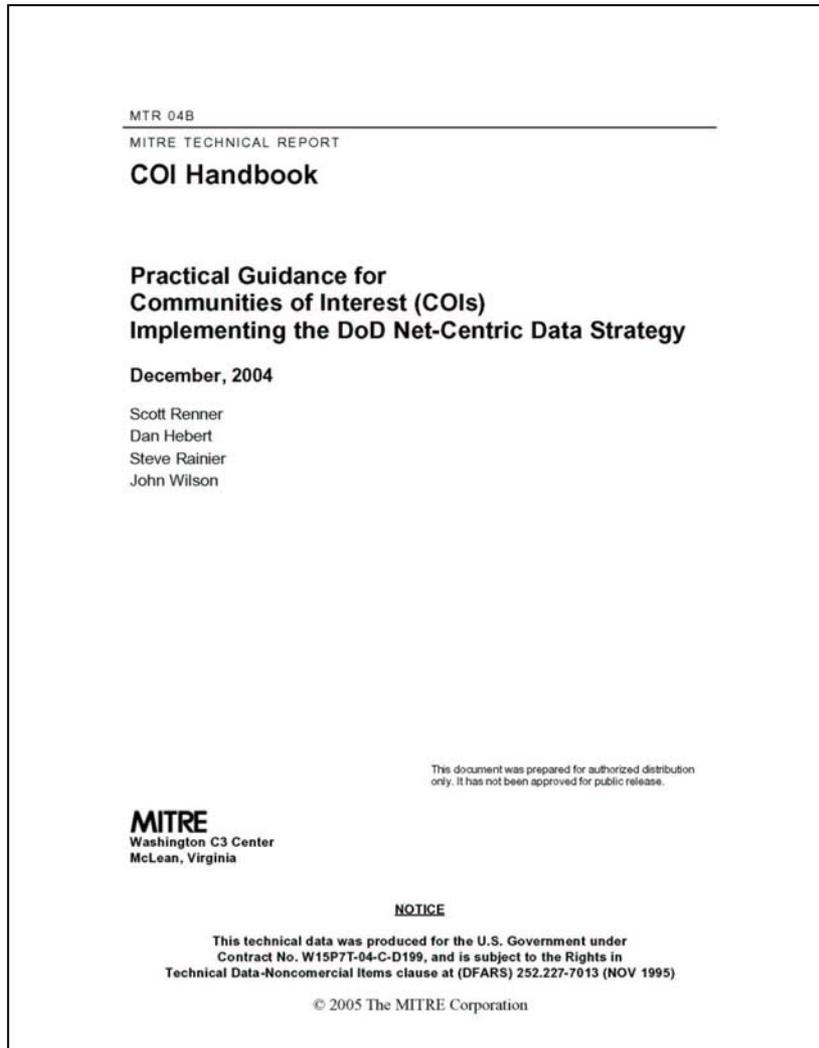


The infospace will include information from other producers, following other vocabularies

Producers will post to other infospaces, using other community vocabularies

Other producers and other infospaces will use the community vocabulary

The COI Handbook

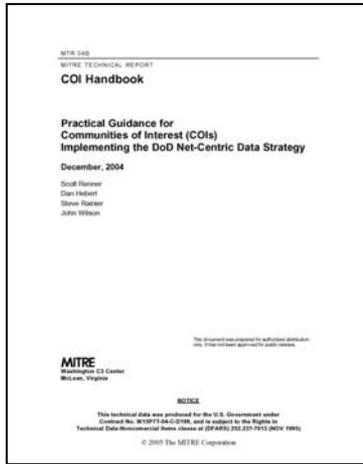


- **Tasks and Responsibilities**
 - **Shared Vocabulary**
 - **Shared Information Space**
 - **Information Owners and Data Producers**

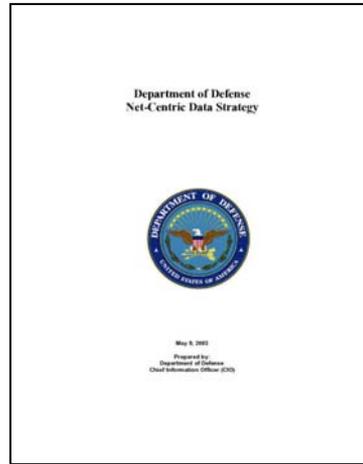
- **Implementation Guidance**
 - **Exploration Spiral**
 - **Implementation Spiral**
 - **Operations Spiral**

- **Case Study**

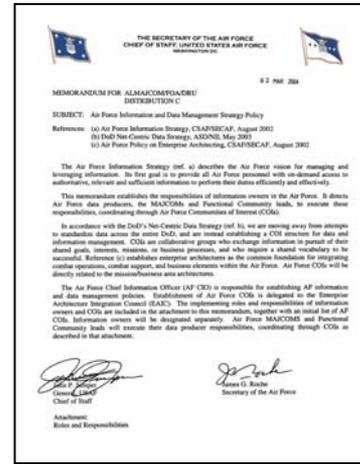
COI Handbook In Context



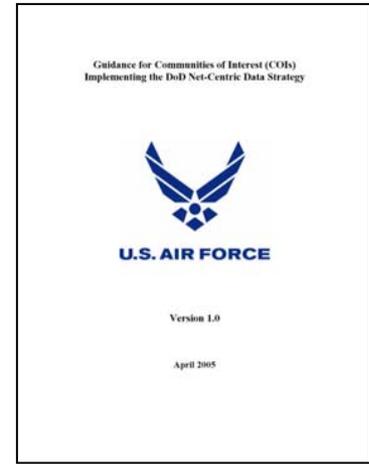
COI Handbook



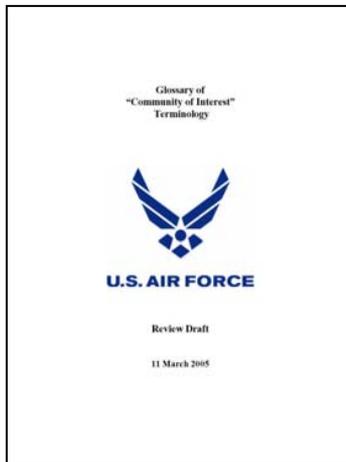
Net-Centric Data Strategy



AF I&DMS



AF COI Guidance



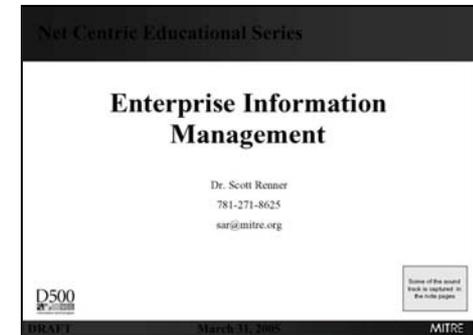
COI Glossary



Common Vocab. Style Guide



Net-Centric IM



Enterprise IM

Summary

- **Purpose of information management**
 - Right information to right person at right time and place
 - Ensure that information exists, is discoverable and understandable
- **Elements of net-centric IM**
 - Shared information spaces
 - Info owners / data producers
 - Community vocabularies
 - Implementation and infrastructure