Association for Configuration and Data Management

The Management of Change

Data Management:
Changing the Paradigm, Reinventing the Process

Joint ACDM & CMWG Regional Symposium

Washington, DC

31 October 2003

Cynthia C. Hauer
CCDM, CMII

MDM

Because Data Transcends Time

LMI®

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ACDM 2004 Conference

Orlando, Florida
Wyndham Hotel
March 22 - 24, 2004

"CM and DM: The Business Process for the Lifecycle"

Conference Overview

- Three Tracks
  - Theory, Application, Tools
- Three Days
  - Plenary, Track Break-outs, Closing Out-briefs
- Complimentary Night Out
- Networking Social
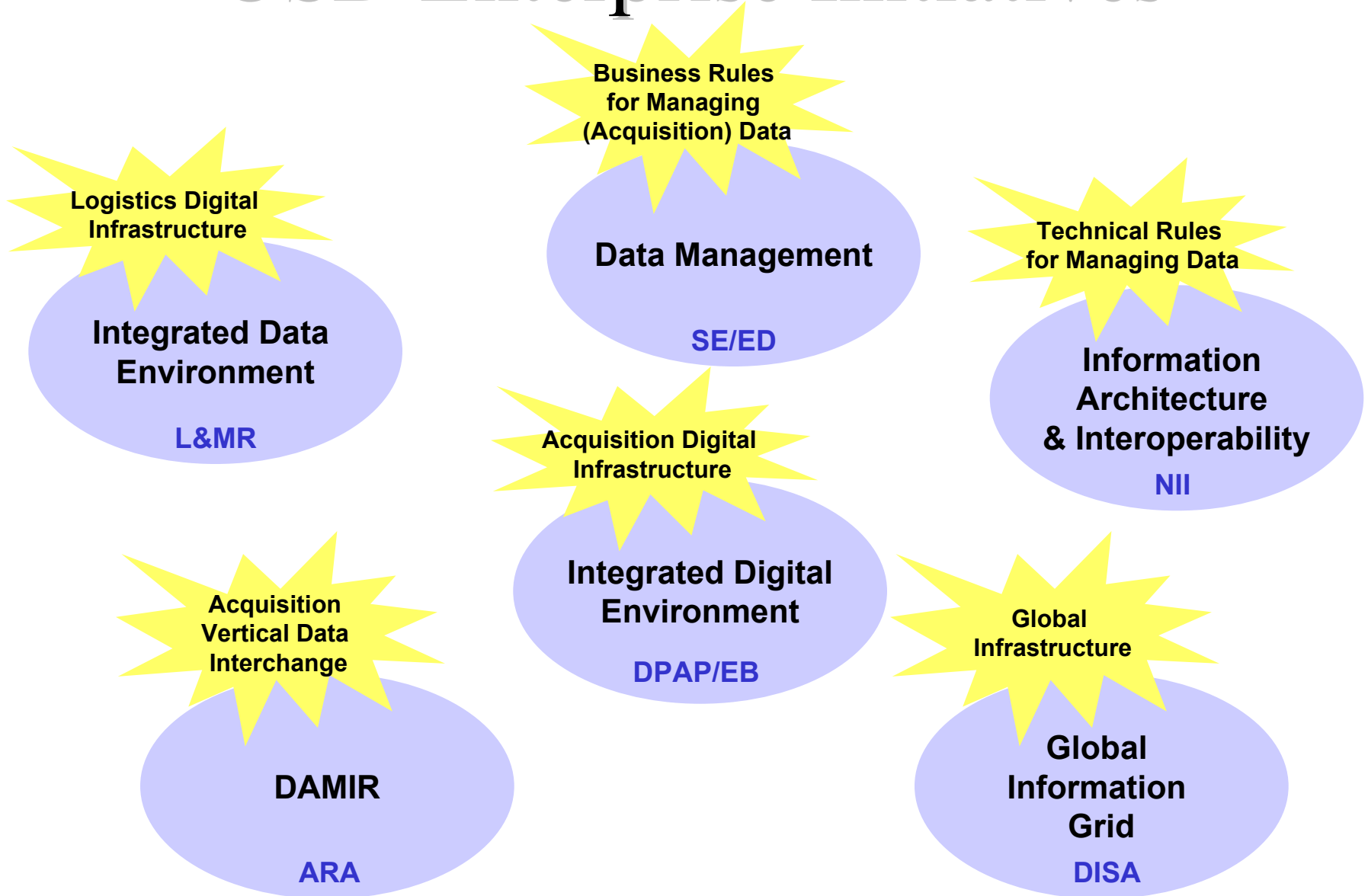- Theme Lunches
- Vendor Shoot-out

AGENDA

- Business Case
- Envisioning the Solution
- Creating the Solution
- The Future for Data Management

Types of Data

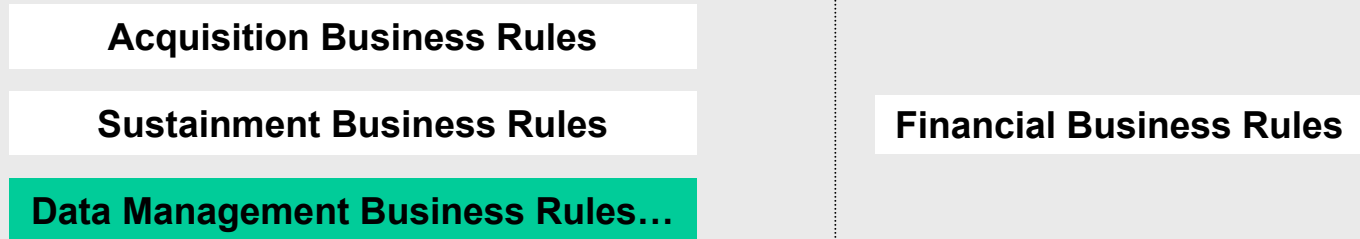| Type *Usage*	Examples
Product *Collaboration*	Cost, schedule, and performance data. Engineering drawings for aircraft, ships, vehicles, spacecraft; parts catalogues; software application, and their components; operational and maintenance instructions, and training materials.
Business *Collaboration*	Plans and programs, financial information, inventory, status, and resource info.
Operational *Transactional Records Exchange*	Orders, issues, receipts, bills of lading, and invoices.

Focus of this project

OSD Enterprise Initiatives

Business Rules for Managing (Acquisition) Data

Logistics Digital Infrastructure

Data Management

SE/ED

Technical Rules for Managing Data

Integrated Data Environment

L&MR

Acquisition Digital Infrastructure

Information Architecture & Interoperability

NII

Acquisition Vertical Data Interchange

Integrated Digital Environment

DPAP/EB

Global Infrastructure

DAMIR

ARA

Global Information Grid

DISA

Framework Views
Preliminary

Elements of
the Data Enterprise
Strategy

859 Focus: Product Data

**Operational
View**

Acquisition Business Rules	
Sustainment Business Rules	**Financial Business Rules**
Data Management Business Rules…	

Pull from DAMIR - back end to ERPs
for information needed to run the Enterprise

**Systems
View**

NMCI ⟷ IDEs

AF? ⟷ IDEs ⟶ DAMIR ⟷ BMMP ⟷ Programming, Budget, Funds Control Systems

AKO ⟷ A-ACE
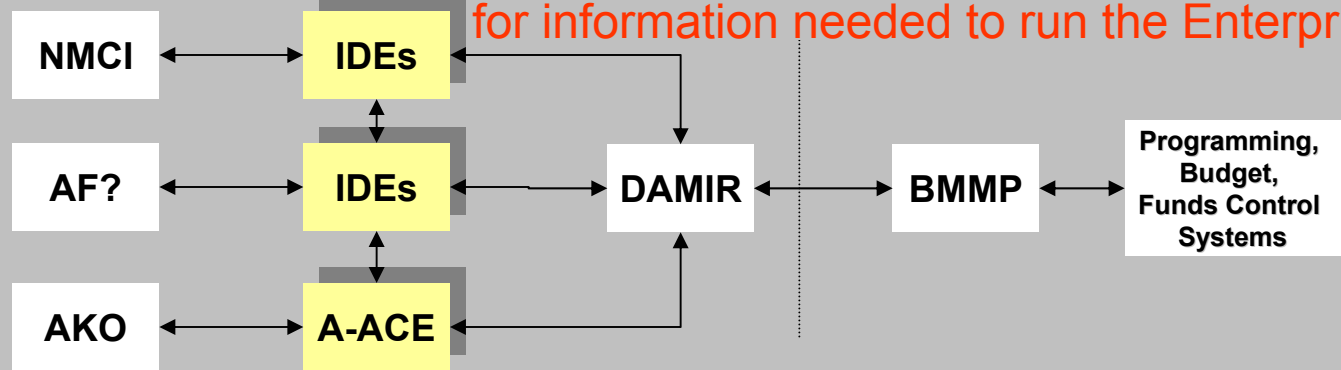
Global Information Grid

**Technical
View**

Metadata Specifications	Security Standards	Others

Federal Enterprise Architecture

Why Is a Consensus Standard for Data Management Needed?

- Data costs a lot

- Can't find data when we need it

- Nobody thinks we do a good job of procuring and managing data

- A lot has changed in acquisition and data environments

- Do not have a contemporary source of sound principles and best practices that addresses digital data
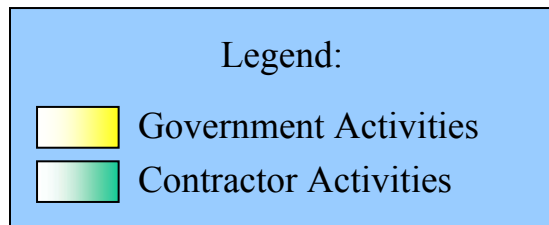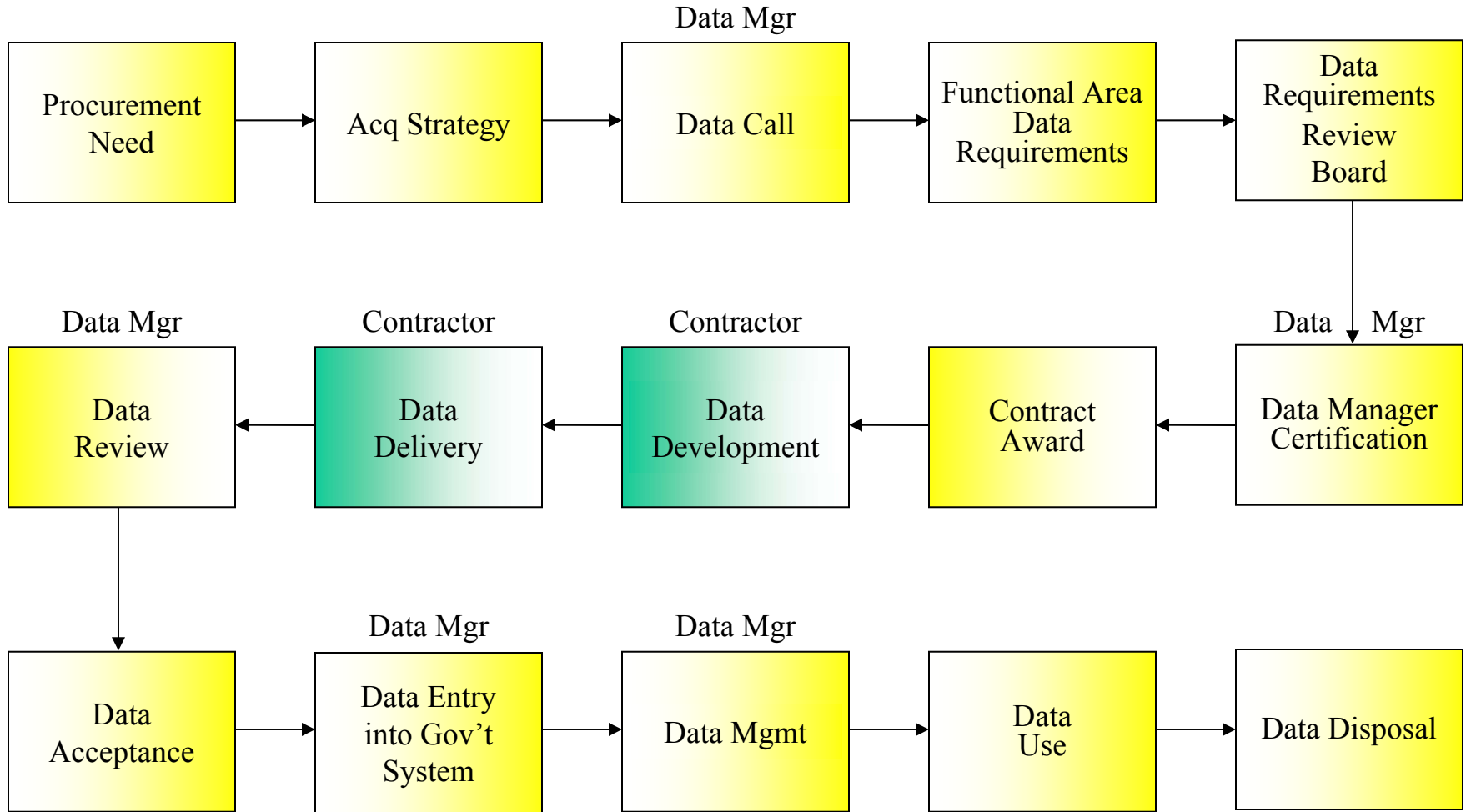
Essential Changes: Data

	Was	Is
Delivery Medium	• Paper	• Electronic
What constitutes delivery	• I mail it, you open it	• I post it on web site, we access it
Standardization of deliverables	• DIDs • Use mandatory • Tailoring permitted, but made intentionally difficult	• DIDs radically tailored or ignored entirely
Data environment	• Slow • Bulky, paper storage • Fairly standard • Limited number of copies • Sometimes hard to find or obtain copy	• Rapid to instantaneous • Compact electronic storage • Non-standard • Essentially infinite number of copies • Still difficult to find
Availability in future	• Infinitely available and interoperable as long as copies not misplaced	• Electronic formats subject to rapid technological obsolescence

Essential Changes: Acquisition & Logistics

	Was	Is
Relationship between government and contractors	Adversarial/hierarchical	Moving toward trust-based relationships
Target product support environment	Assumed to be DoD organic, exceptions for commercial products	Mix of forms ▼ Organic-led with contractor support ▼ "Pure" contractor ▼ Contractor led with government as sub
Underlying weapon system technologies	Mostly DoD specific	Mix of commercial and DoD specific

Perceived need (and opportunity) to reinvent data management—responsive to current and emerging enviroments.

Data Management Process (Old)

Data Mgr

```
[Procurement Need] → [Acq Strategy] → [Data Call] → [Functional Area Data Requirements] → [Data Requirements Review Board]
```

Data Mgr

```
[Data Review] ← [Data Delivery] ← [Data Development] ← [Contract Award] ← [Data Manager Certification]
```
Data Mgr — Contractor — Contractor — Data Mgr

```
[Data Acceptance] → [Data Entry into Gov't System] → [Data Mgmt] → [Data Use] → [Data Disposal]
```
Data Mgr — Data Mgr

Legend:

- Government Activities
- Contractor Activities
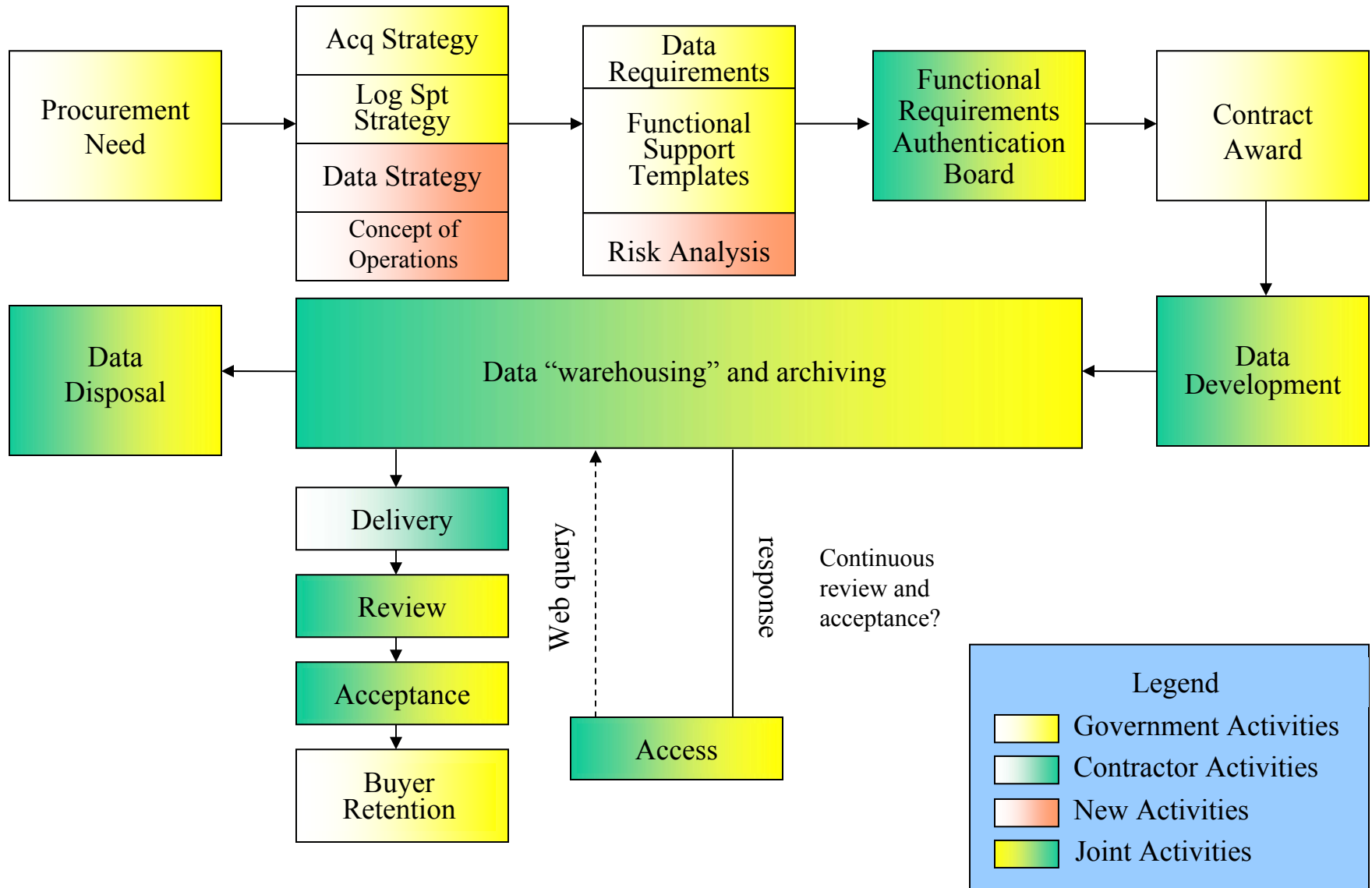
- Had a dedicated and experienced Data Manager
- Sequential Process
- Assumed all contract required data is delivered
- Philosophy was "Buy Everything!"

Evolving Data Management Process (Present and Future)

Paradigmatic Shift: Strategic Level, not Execution Level

```
Procurement Need  →  [ Acq Strategy / Log Spt Strategy / Data Strategy / Concept of Operations ]  →  [ Data Requirements / Functional Support Templates / Risk Analysis ]  →  Functional Requirements Authentication Board  →  Contract Award
```

- Procurement Need
- Acq Strategy
- Log Spt Strategy
- Data Strategy
- Concept of Operations
- Data Requirements
- Functional Support Templates
- Risk Analysis
- Functional Requirements Authentication Board
- Contract Award

Data Disposal ← Data "warehousing" and archiving ← Data Development

Data "warehousing" and archiving ↓

- Delivery
- Review
- Acceptance
- Buyer Retention

Web query ↑

response ↓

Continuous review and acceptance?

Access

Legend
- Government Activities
- Contractor Activities
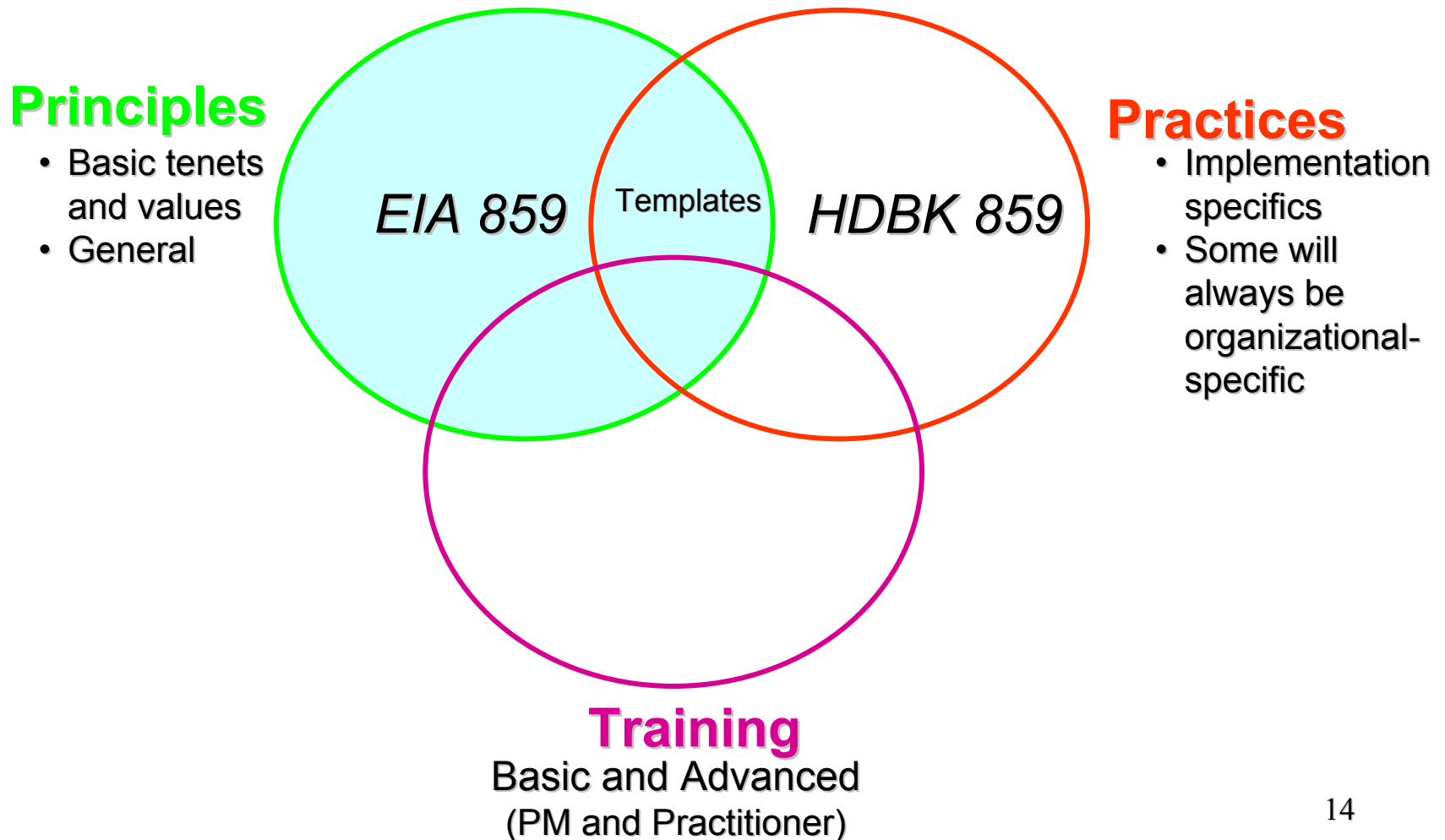- New Activities
- Joint Activities

June 2000 GEIA G-33 Meeting Summary and Proposal

- Are unmet needs
  - IT data administration not postured to address them but
  - Data management field not either, in need of reinvention

- Proposal
  - Requirements phase to identify the needs
  - Look at *commercial and military* needs

- Subsequent requirements analysis confirmed need for statement of contemporary principles of data management
- GEIA assigned EIA-859 to the project

Where the Standard Fits in a Data Management Solution

Three Primary Areas - Principles, Practices, and Training

Principles
- Basic tenets and values
- General

Practices
- Implementation specifics
- Some will always be organizational-specific

EIA 859

Templates

HDBK 859

Training
Basic and Advanced
(PM and Practitioner)

Who Is Presently Involved in the Solution? (Organizationally and Functionally)

- Industry
  - Lockheed Martin, Raytheon, Boeing, UDLP, United Defense, General Dynamics, Northrop Grumman
- Government
  - All 3 services (Army, Navy, Air Force)
  - DCMA
  - NASA
- DM practitioners, program managers, contracts specialists, logisticians, engineers, information technologists

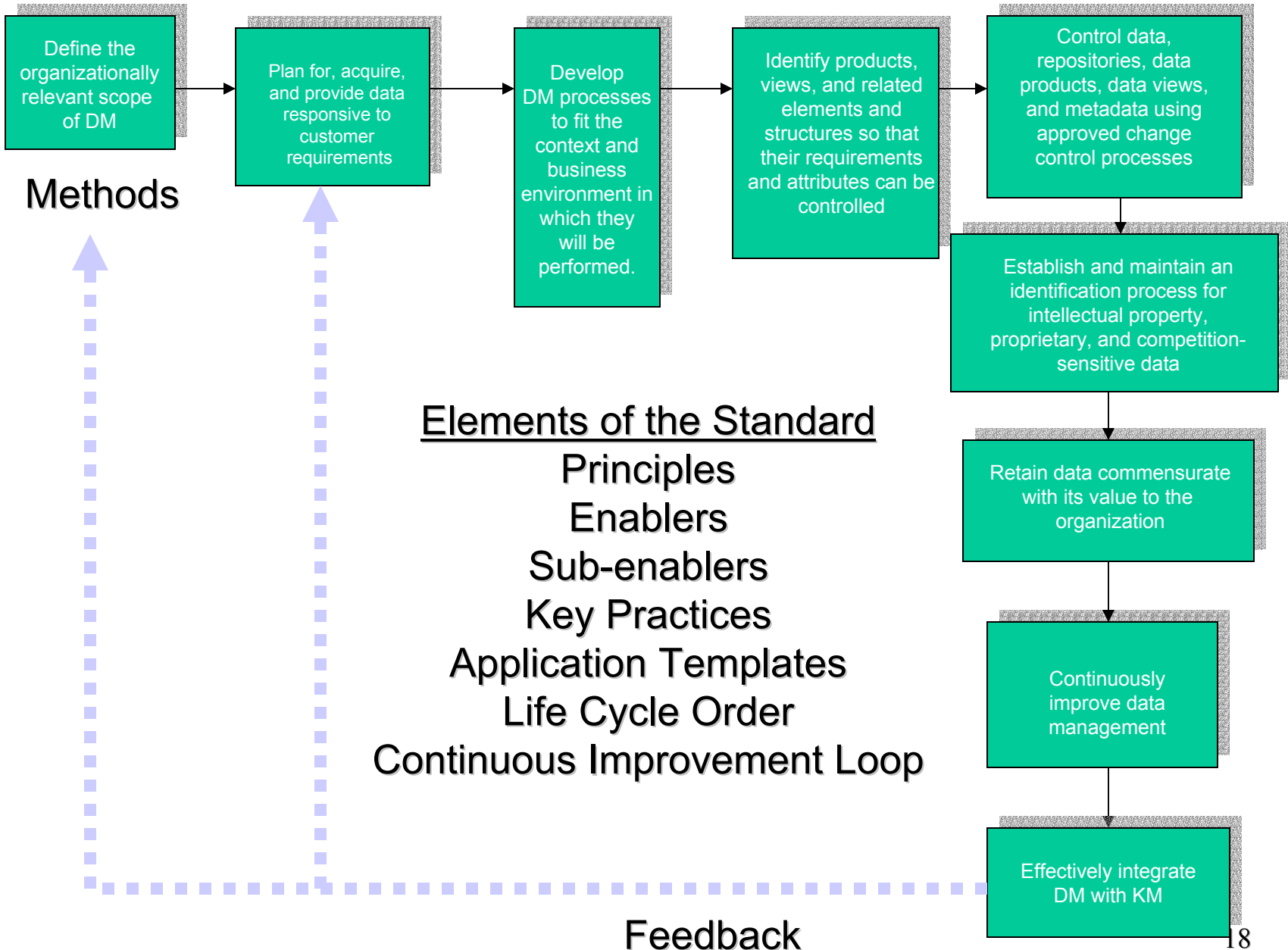# Principles in EIA 859 intended to be the basis for . . .

- Articulating the data performance and functional requirements in support of:
  - Internal program management during the acquisition phases
  - Review and oversight of contract performance
  - Operation
  - Sustainment--including sustaining engineering, maintenance, materiel management, transportation, facilitization, ...

EIA-859 DATA MANAGEMENT PRINCIPLES

1 Define the organizationally relevant scope of data management

2 Plan for, acquire, and provide data responsive to customer requirements.

3 Develop DM processes to fit the context and business environment in which they will be performed.

4 Identify data products and views so that their requirements and attributes can be controlled.

5 Control data, repositories, data products, data views, and metadata using approved change control processes.

6 Establish and maintain an identification process for intellectual property, proprietary, and competition-sensitive data.

7 Retain data commensurate with value to the organization.

8 Continuously improve data management.

9 Effectively integrate data management with knowledge management.
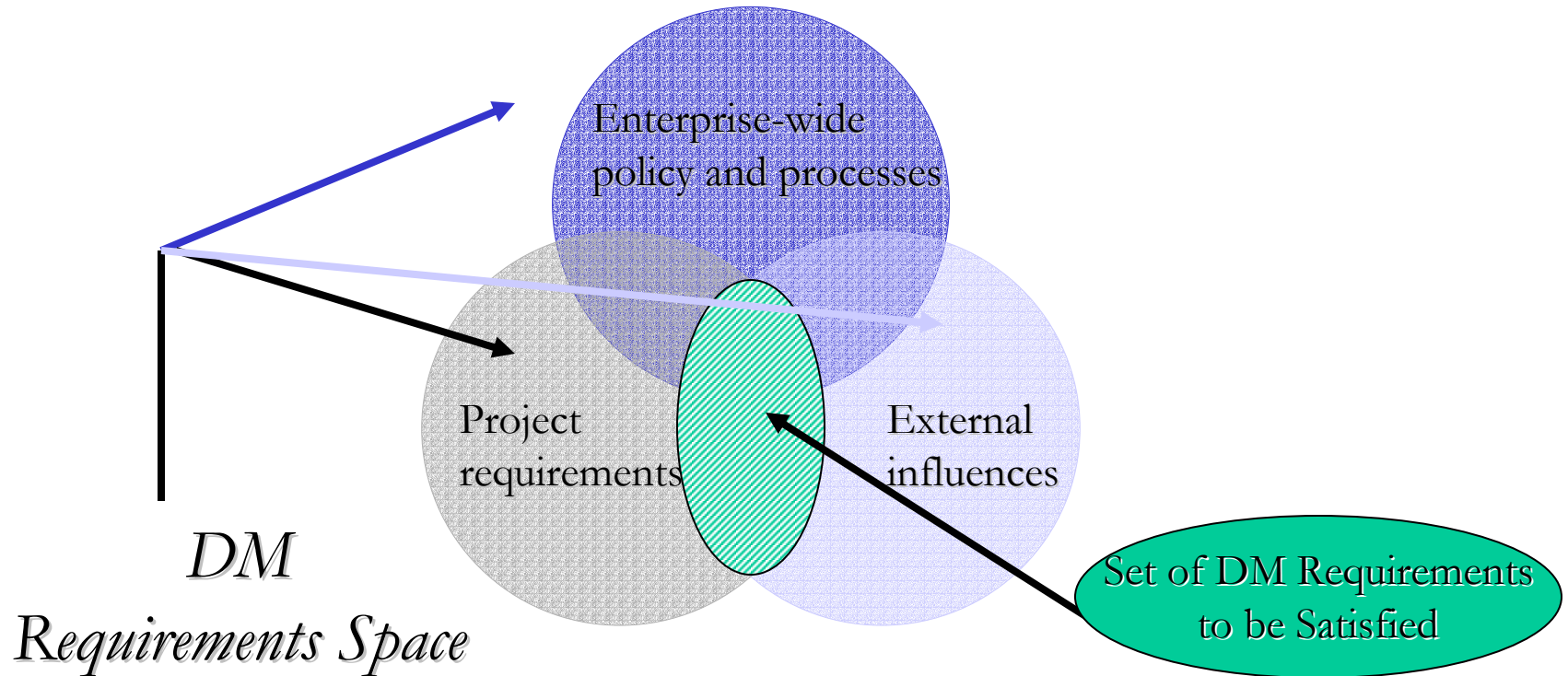
EIA-859 Top-Level Principles

Define the organizationally relevant scope of DM

Plan for, acquire, and provide data responsive to customer requirements

Develop DM processes to fit the context and business environment in which they will be performed.

Identify products, views, and related elements and structures so that their requirements and attributes can be controlled

Control data, repositories, data products, data views, and metadata using approved change control processes

Establish and maintain an identification process for intellectual property, proprietary, and competition-sensitive data

Retain data commensurate with its value to the organization

Continuously improve data management

Effectively integrate DM with KM

Methods

Elements of the Standard
Principles
Enablers
Sub-enablers
Key Practices
Application Templates
Life Cycle Order
Continuous Improvement Loop

Feedback

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Principle 3

Enterprise-wide policy and processes

Project requirements

External influences
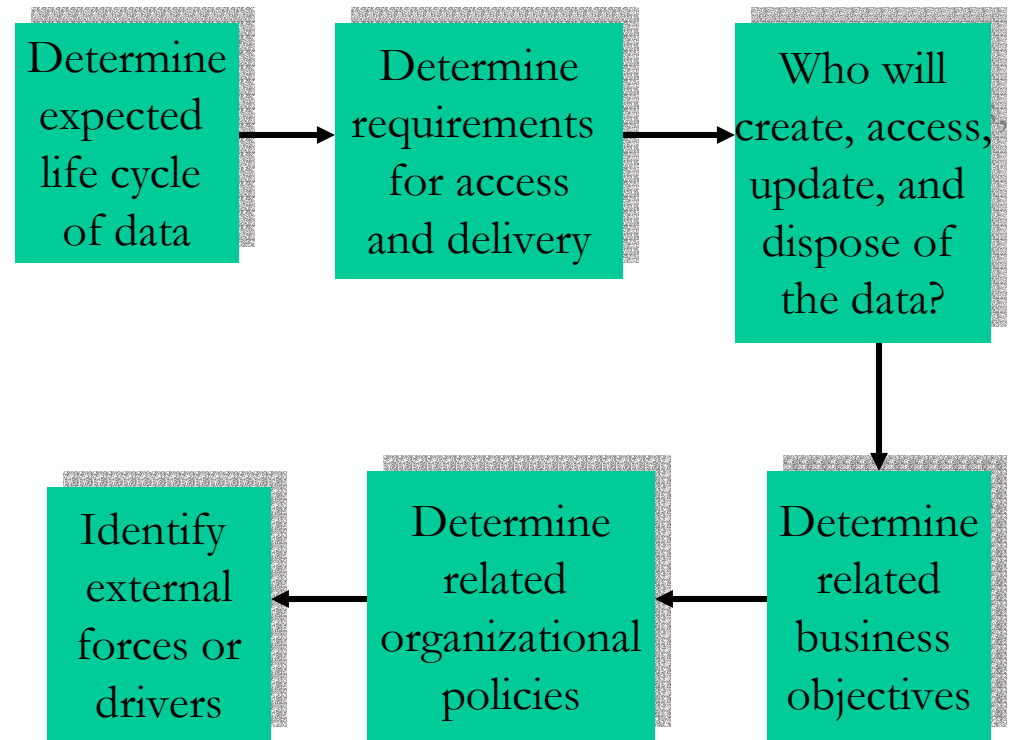
DM Requirements Space

Set of DM Requirements to be Satisfied

Develop Data Management processes to fit the context and business environment in which they will be performed.

Enabler 3.1: Determine the complete set of requirements that the DM solution must address
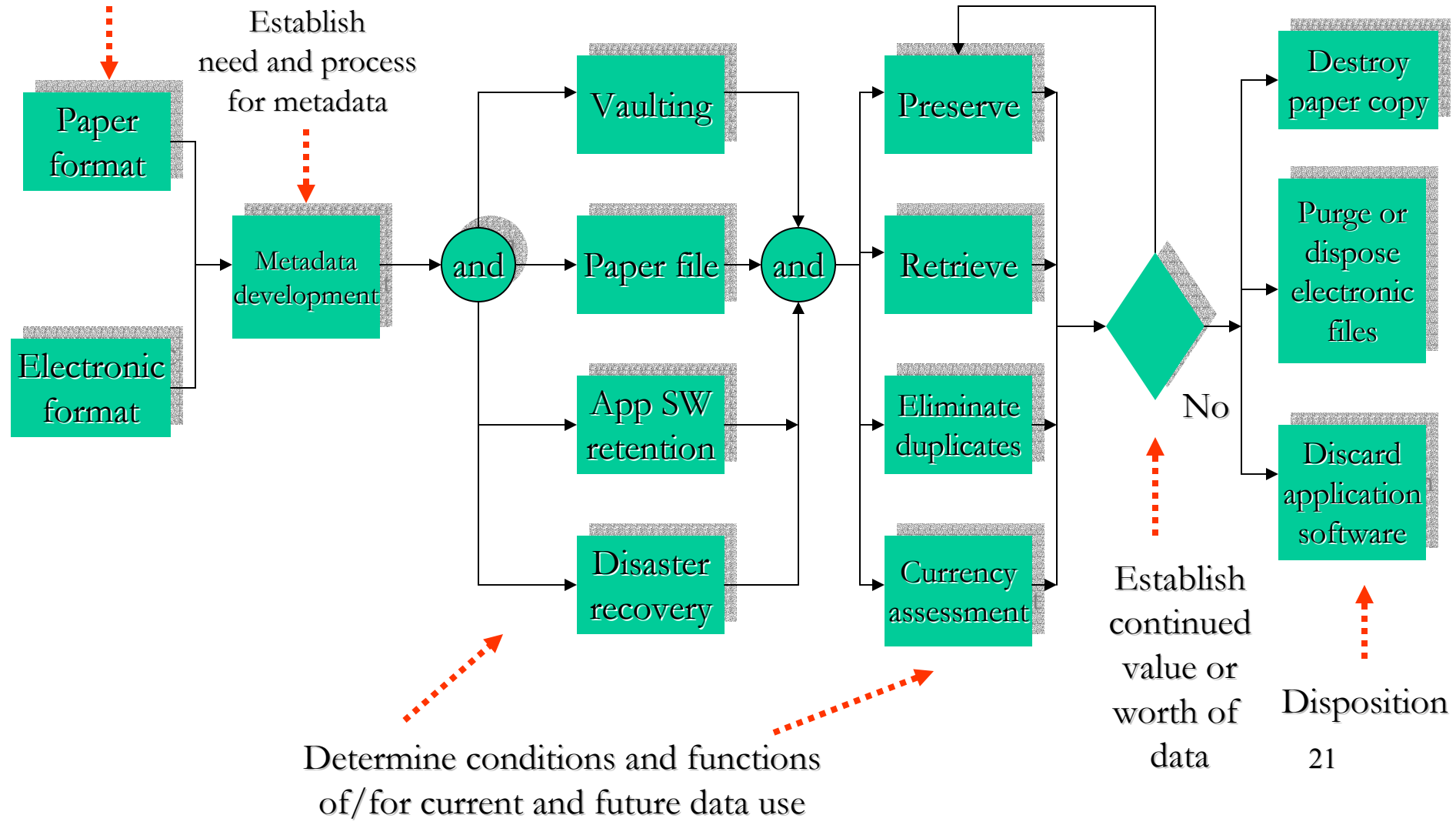
- General requirements
- Data capabilities
- Data processes
- Intended use of the data
- Related business objectives
- Technology issues
- External constraints

```
Determine          Determine          Who will
expected    →    requirements   →   create, access,
life cycle         for access        update, and
of data          and delivery        dispose of
                                      the data?
                                          ↓
Identify          Determine          Determine
external    ←      related      ←      related
forces or       organizational       business
drivers            policies          objectives
```
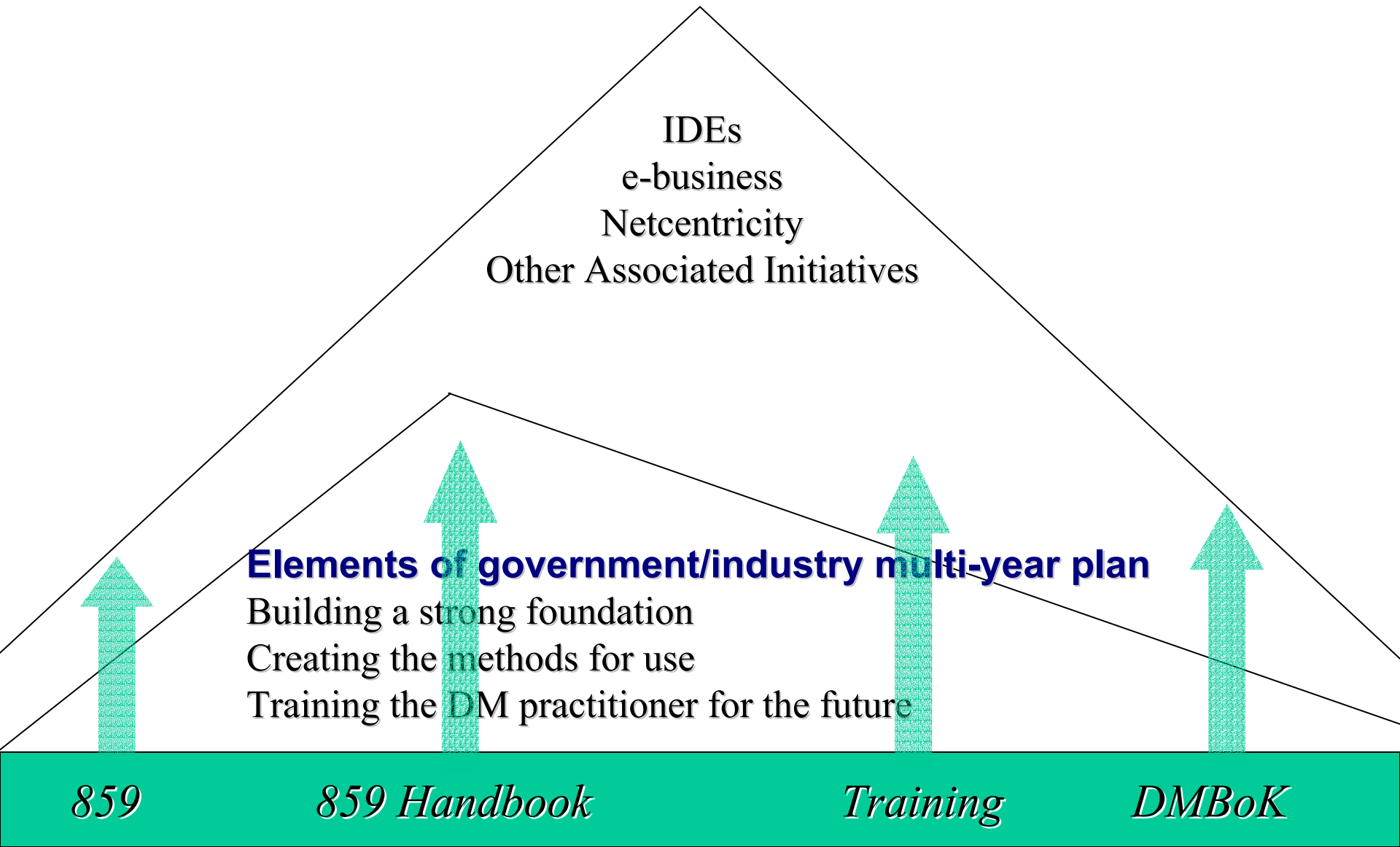
Principle 7: Retain data commensurate with value.
Planning decision tree for determining data of sustained value
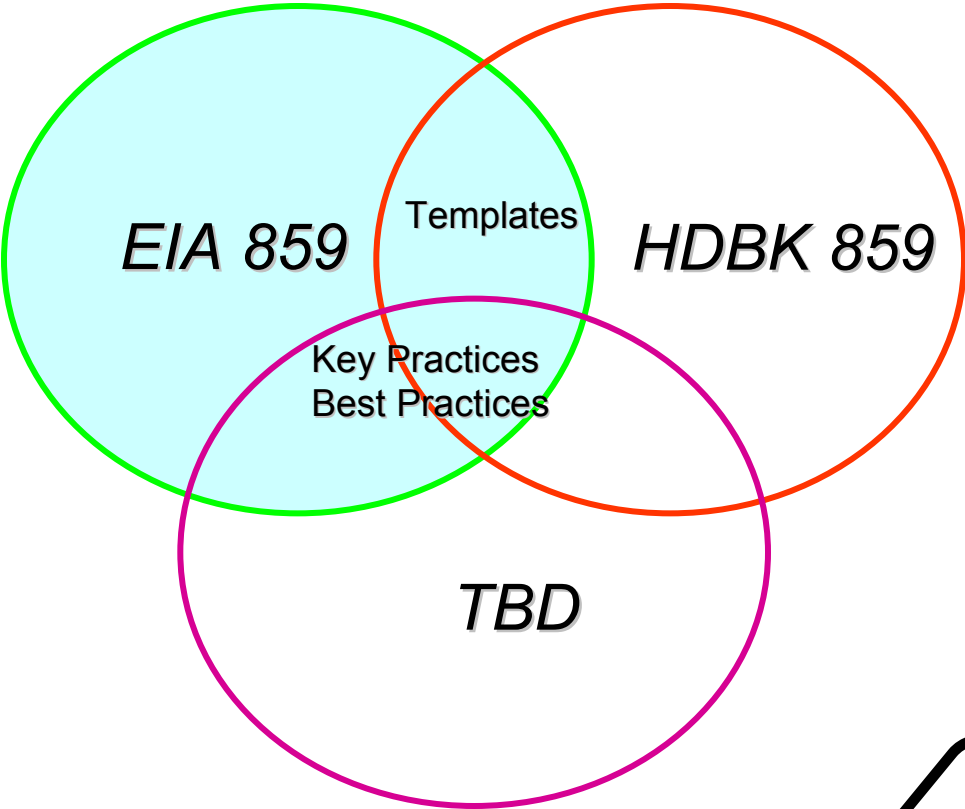
Consider paper
vs electronic format

Establish
need and process
for metadata

Yes

Paper
format

Metadata
development

and

Vaulting

and

Preserve

Destroy
paper copy

Electronic
format

Paper file

Retrieve

Purge or
dispose
electronic
files

No

App SW
retention

Eliminate
duplicates

Disaster
recovery

Currency
assessment

Discard
application
software

Determine conditions and functions
of/for current and future data use

Establish
continued
value or
worth of
data

Disposition

The Larger Picture

IDEs
e-business
Netcentricity
Other Associated Initiatives

Elements of government/industry multi-year plan
Building a strong foundation
Creating the methods for use
Training the DM practitioner for the future

859 *859 Handbook* *Training* *DMBoK*

Data Management Solution, continued

Principles
- Basic tenets and values
- General

EIA 859

Templates

Practices

HDBK 859

Key Practices
Best Practices

TBD
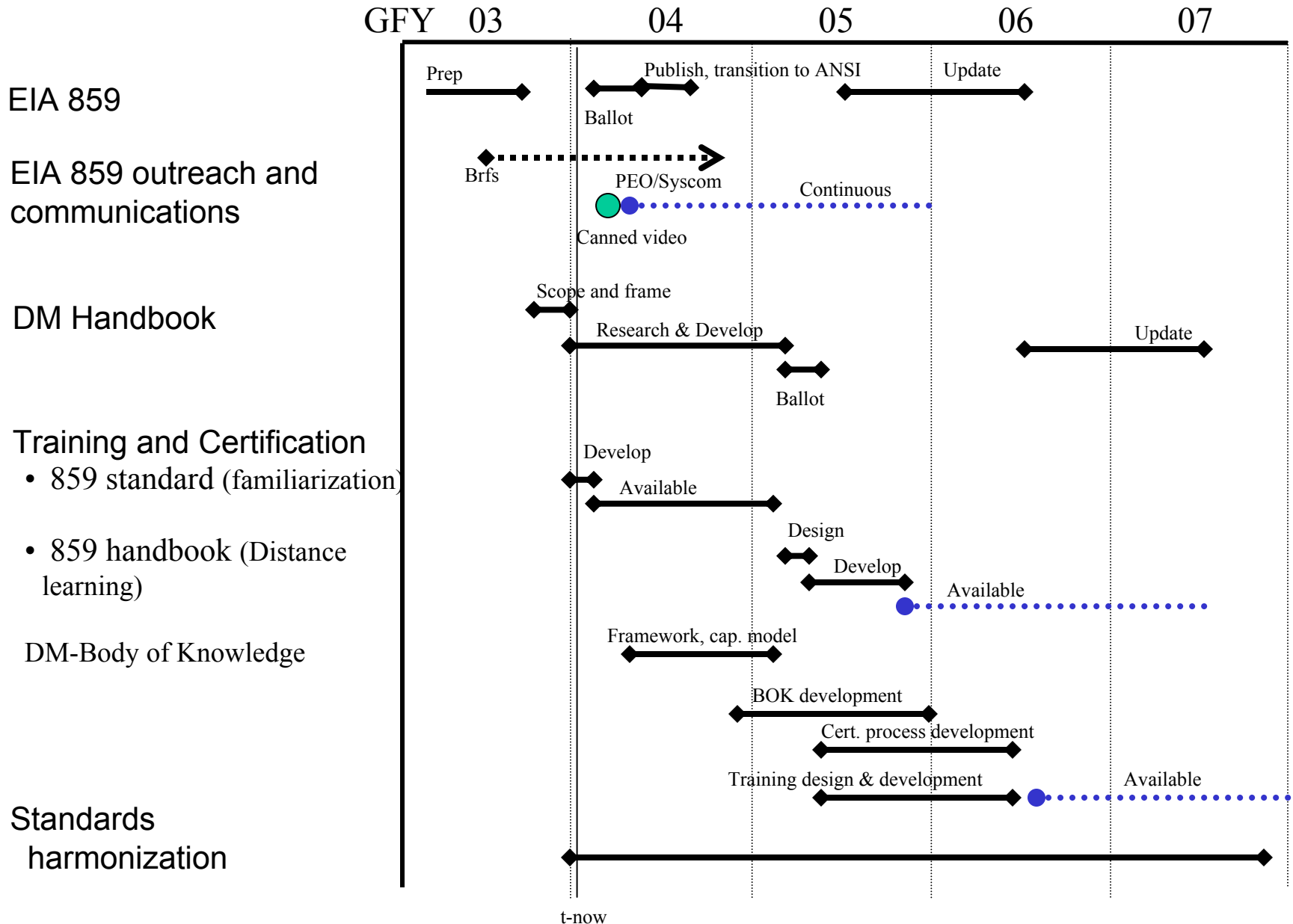
Training
Basic and Advanced
(PM and Practitioner)

Complete solution addresses all three

Near Term

- Outreach/communications
  - AFIT distance learning web module development (Nov 03)
  - Familiarization briefings
    - NSA ☑
    - NDIA Systems Engineering Conference ☑
    - Others as identified
- 859 Finalization - Estimated November 2003
  - Completion of government annex
  - Comments adjudication
  - Handover to GEIA
  - Review & Balloting
- OSD Briefings and Coordination (Logistics, DPAP, ARA, NII)
- Establish consensus to more forward with Handbook 859
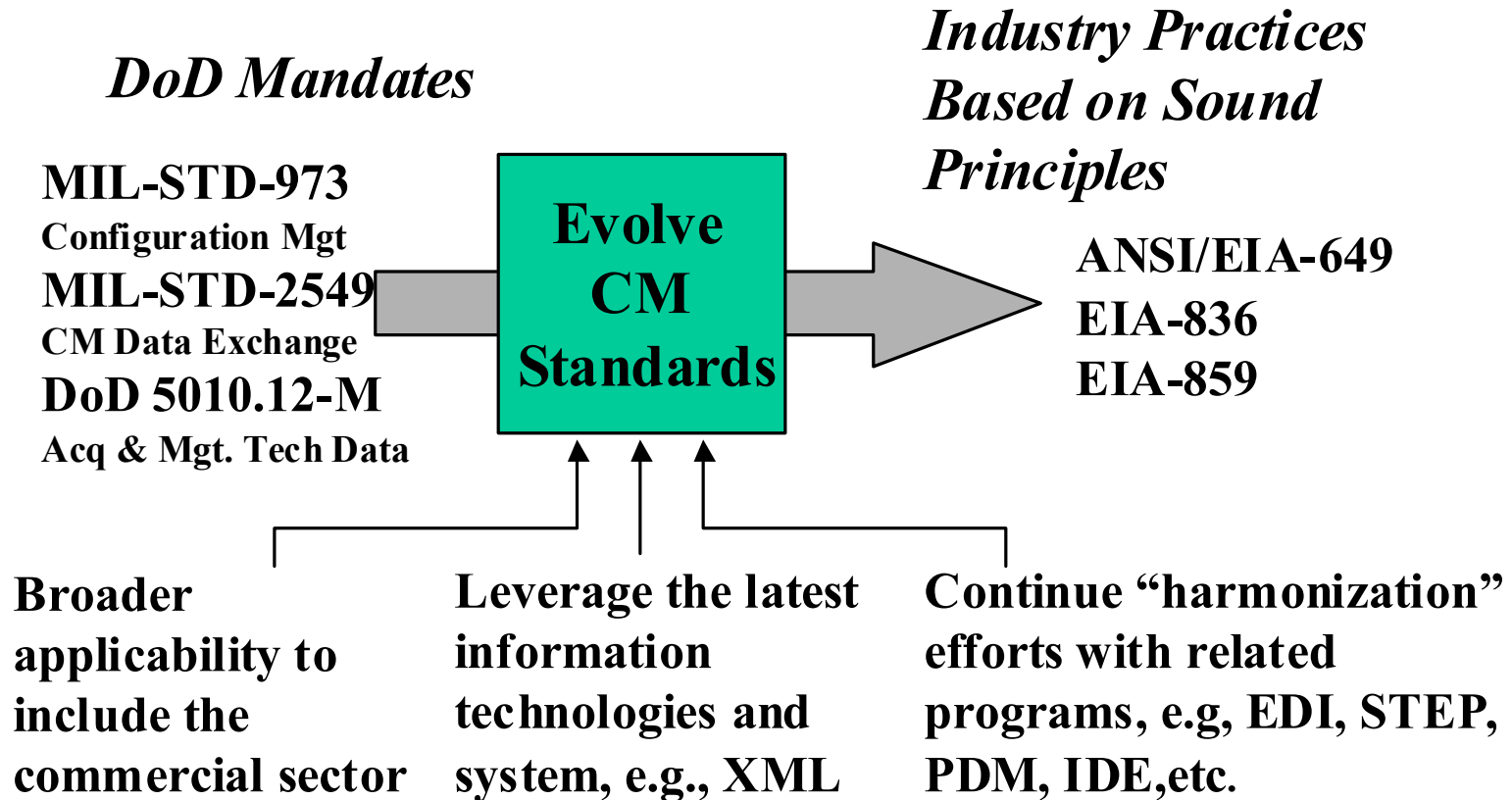
Data Management Five Year Outlook

GFY   03   04   05   06   07

EIA 859
- Prep
- Ballot
- Publish, transition to ANSI
- Update

EIA 859 outreach and communications
- Brfs
- PEO/Syscom
- Canned video
- Continuous

DM Handbook
- Scope and frame
- Research & Develop
- Ballot
- Update

Training and Certification
- • 859 standard (familiarization)
  - Develop
  - Available
- • 859 handbook (Distance learning)
  - Design
  - Develop
  - Available

DM-Body of Knowledge
- Framework, cap. model
- BOK development
- Cert. process development
- Training design & development
- Available

Standards harmonization

t-now

Summary

- New world of, for DM
- Needed a fresh way to think about it
  - New recipes, improved methods
- Established the principles for the "new" DM
  - 859 drafted
  - Nearing the end-game
- Next logical step is practitioner-level handbook

backup

Transition to Industry Standards

DoD Mandates

MIL-STD-973
Configuration Mgt
MIL-STD-2549
CM Data Exchange
DoD 5010.12-M
Acq & Mgt. Tech Data

Evolve CM Standards

Industry Practices Based on Sound Principles

ANSI/EIA-649
EIA-836
EIA-859

Broader applicability to include the commercial sector

Leverage the latest information technologies and system, e.g., XML

Continue "harmonization" efforts with related programs, e.g, EDI, STEP, PDM, IDE,etc.

2

Yesterday, Today, and Tomorrow of Data Management

- Paper-based (DoD 5010.12-L -M)
  - Did have repeatable DM methods, "monolithic" community
- Today, mixed forms, emerging dominance of electronic data, access becoming quicker and cheaper)
  - Have pockets of excellence, but not contemporary repeatable methods
  - EIA 859 in development
  - Will need practitioner-level handbook/guidebook, associated training
- Tomorrow (collaborative environments, nearly instant access to data if you can find it)
  - Technology is bound to stay in front of practice
  - Many horses in the race (IT standards and policy, acquisition practice and policy, sustainment methods and policy)
  - Development of repeatable DM methods will be a continuous activity

Purpose and Scope

- Purpose
  - Provide a guide to acquire and manage data across product life-cycle
  - Enable sharing of data among trading partners

    … in a performance-based environment

- Scope
  - Common principles
  - Related enablers
  - Key practices
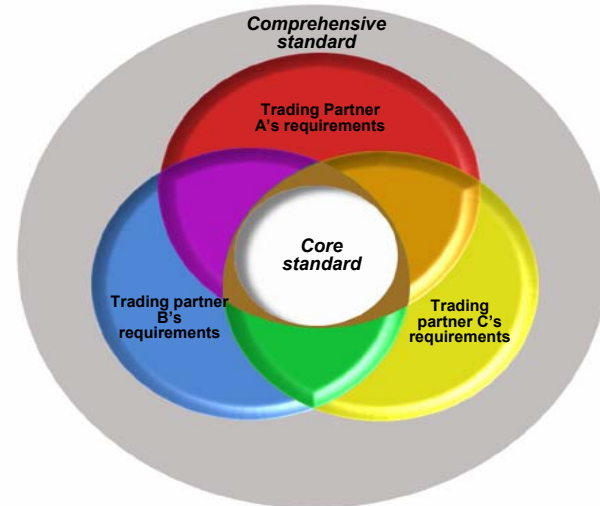
Standards Harmonization

- Related EIA standards (EIA 649, EIA 836, EIA 927)
- Collaboration infrastructure services (e.g., workflow, document management)
- Integration services (e.g., application and data integration)
- Portal services (e.g., access and security, personalization)
- Others …

Some of these exist, some may need to exist

Data Manager Roles

- Data requirements IPT facilitator
- Contractor/PCO Data Interface
- Data management liaison to IT
- "Traffic cop"
  - Requirements
  - Delivery and access
- Life cycle data manager
- Environment management
  - Longevity
  - Infrastructure and backbone requirements (planning, timing, provisions for)
  - Forecasting
  - . . .

Managers and coordinators rather than clerks
Requires professionalization of data management field