



Metadata Requirements and Standards

CDAO Office Update

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AGENDA



- Authority and Purpose
- Metadata in the Data Standards Ecosystem
- Our Dual Focus: Metadata Requirements and Standards
- Many Requirements Are Known - Many Standards Already Exist
- Framework to Align Requirements and Standards
- Governance
- Ontologies
- Questions



CDAO Authority



The Department of the Air Force Chief Data and Artificial Intelligence Officer (CDAO) is empowered by Headquarters Air Force Mission Directive 1-26 to set enterprise data policy, governance, and lifecycle management to make Air Force and Space Force data Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, and Secured (VAULTIS).



Purpose and Value of the Framework



Establishes a centralized, repeatable process for validating metadata requirements and approving standards across the Department of the Air Force.

- Enables interoperability across DAF systems
- Ensures legal and regulatory compliance
- Reduces duplication through reuse of existing standards
- Centralizes visibility of metadata assets



Positioning Metadata in the Data Standards Ecosystem



Policy and Governance Requirements (e.g., DoDI 8320.07, OMB Circular A-130, M-19-23)

Semantic Standards (e.g., NIEM, RDF, OWL, DICO, BFO)

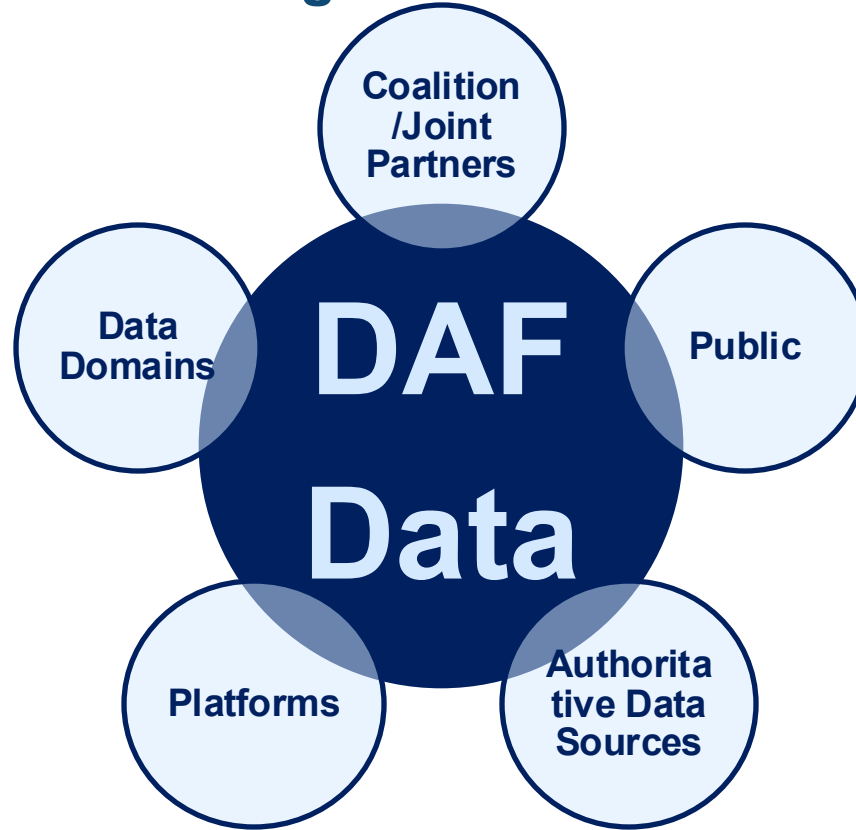
Metadata Standards (e.g., IRM, ISM, Dublin Core, ISO 11179)

Data Format Standards (e.g., JSON, XML, CSV)

API & Interface Standards (e.g., REST, OpenAPI, GraphQL)



Focus - Data Exchange





Our Dual Focus: Metadata Requirements and Standards



	Metadata Requirements	Metadata Standards
Definition	What metadata must be captured	How metadata is structured, labeled, and shared
Driven by	Mission needs, compliance, interoperability	Implementation best practices, reuse, extensibility
Examples	Provenance, access control, data type, classification, DoD Minimum Essential Metadata, DoDI 5015.02	IRM, ISM, Dublin Core, NIEM, ISO 11179
Risk if missing	Mission gaps, compliance failure, liability	Inconsistency, incompatibility across systems
CDAO Approach	Capture, align, and document validated requirements from authoritative guidance	Promote reuse of existing standards; define extensions only when necessary



Many Requirements Are Known Many Standards Already Exist



Access Control

- Information Security Marking (ISM)
- NIST SP 800-53

Discovery

- Information Resource Metadata (IRM)
- Data Catalog Vocabulary (DCAT)

Retention

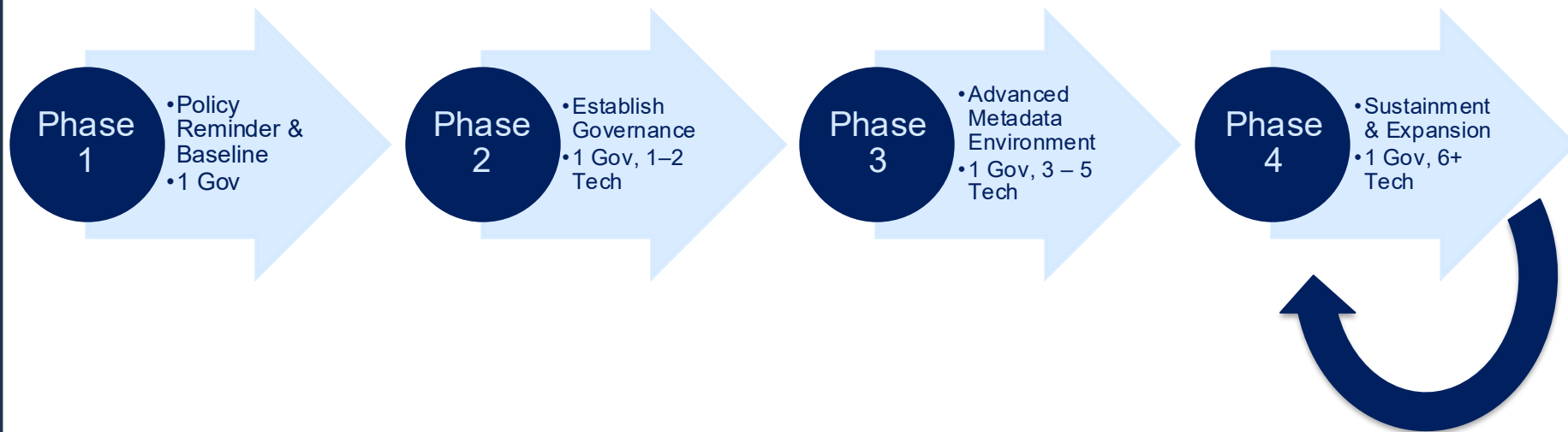
- DoDI 5015.02
- NARA Standards

Provenance / Lineage

- IRM
- Dublin Core

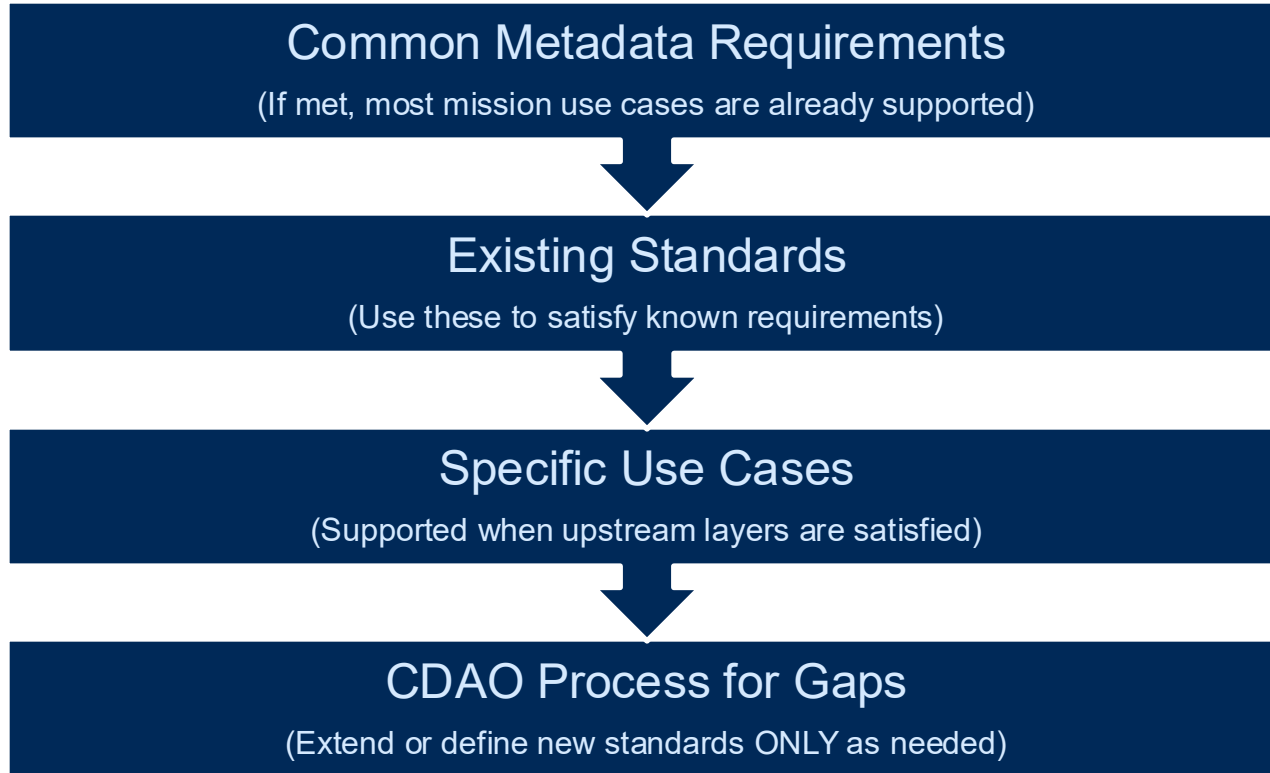


Roadmap Overview



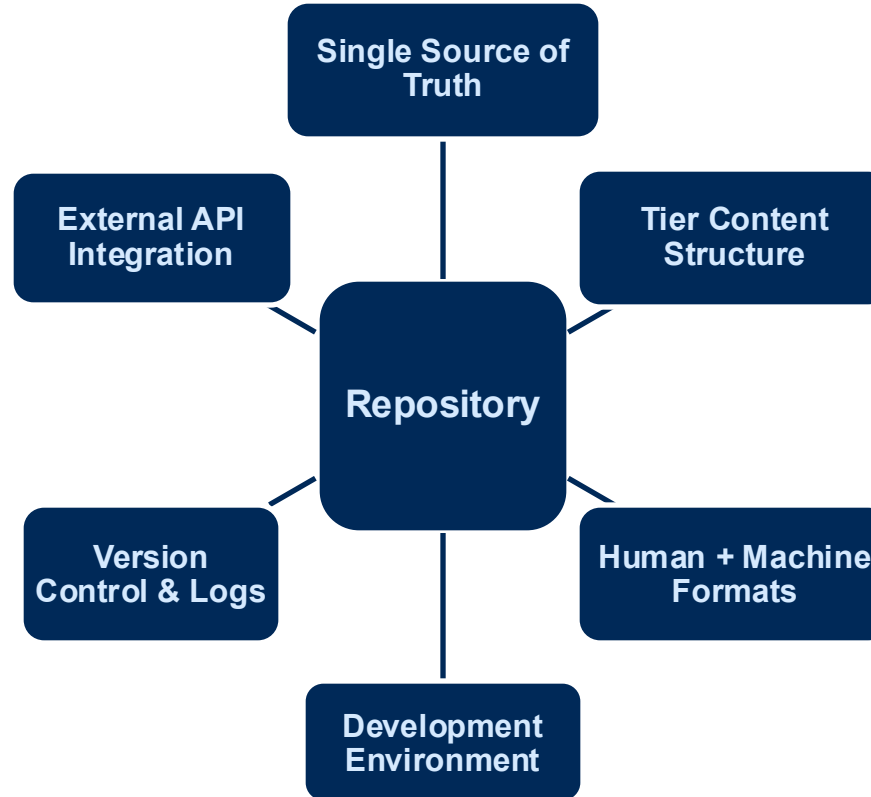


A Framework to Align Requirements and Standards – With Coverage and Gap Resolution





Centralized Metadata Repository





DAF Tiered Governance Structure



DAF Data & AI Board

- Executive oversight and approval

DAF Data & AI Group

- Technical review and coordination

Functional/Data Domains

- Requirements and standards proposals

Metadata Technical Team

- Technical execution & support

Cross-Governance Coordination

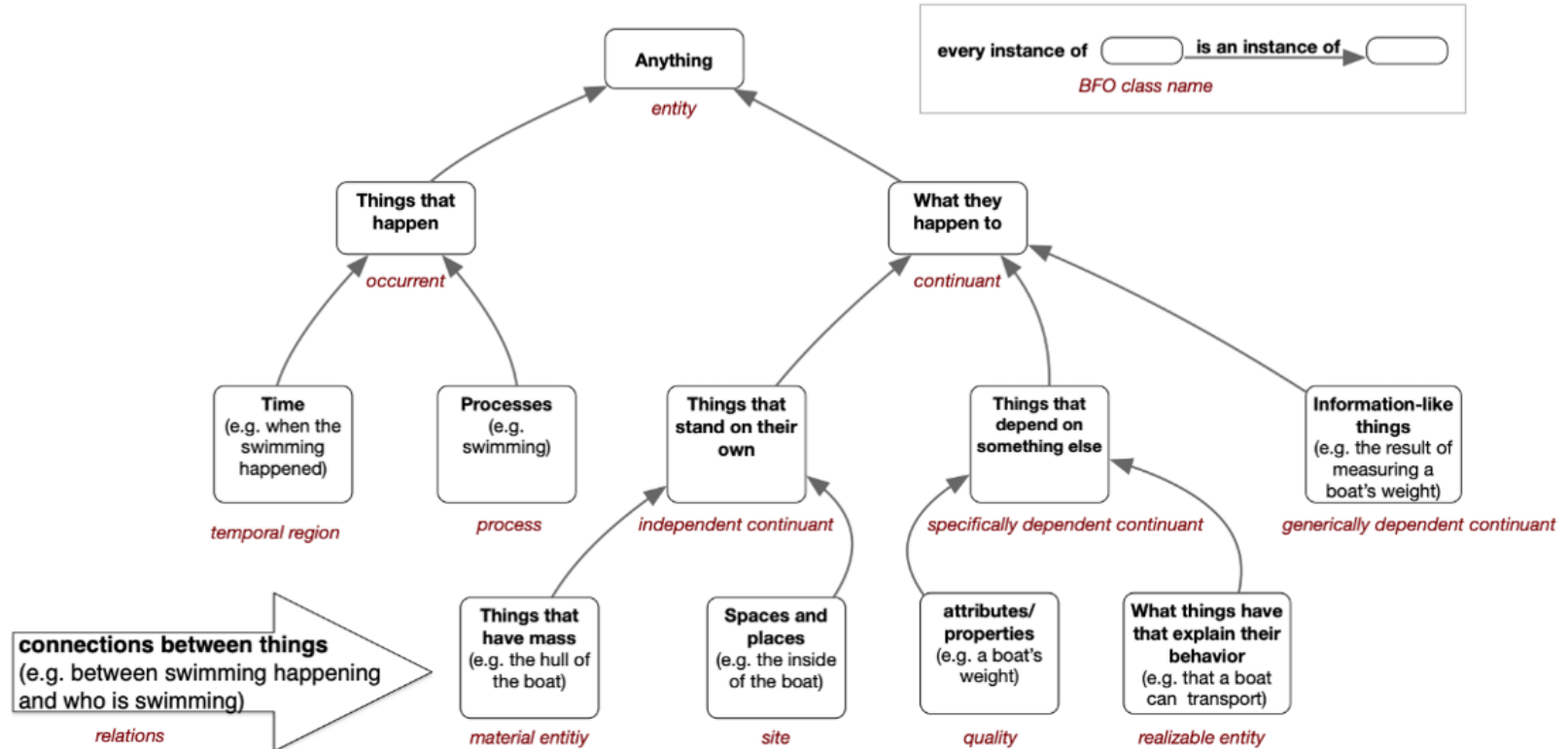
- Coordination with other governance bodies



WHAT IS THE MEANING OF ONTOLOGIES?



What is an Ontology?





DoD Ontology Guidance Timeline



2023

- DIOWG
- Charter

2024

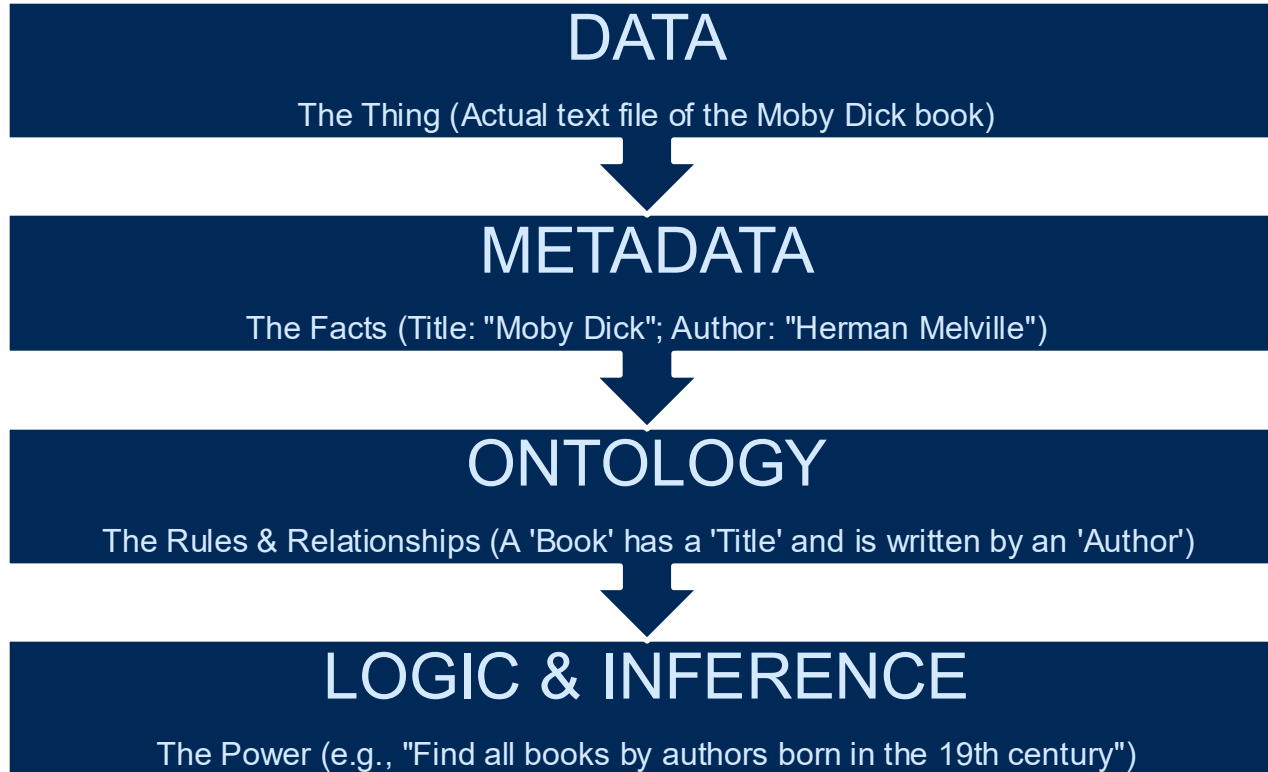
- Baseline Standards
- Memo

2025

- DOGWG
- NDAA



Metadata Ontology Workflow





Summary: Ontology vs. Metadata

	Metadata	Ontology
Purpose	To describe a specific data asset	To define a domain of knowledge
Scope	This photo was taken here	A photo can have a location
Structure	Key-value pairs	Classes, Properties, Rules
Example	artist: “Leonardo da Vinci”	Class: Artist, Class: Painting Artist paints Painting
Analogy	A filled-out tax form.	The blank tax form with all its rules and instructions.



Learn More



BUILDING ONTOLOGIES WITH BASIC FORMAL ONTOLOGY

ROBERT ARP | BARRY SMITH | ANDREW D. SPEAR





QUESTIONS

Note: Reference to any non-government entity is for informational purposes only and is not to be construed as an endorsement by the Department of the Air Force.