Learning Objects and Knowledge Objects:

Birds of a Feather
or
Different Species Altogether?

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Outline

- Background
- Research Questions
- Literature Review
- Lessons Learned
- Real-life Examples
- Conclusion

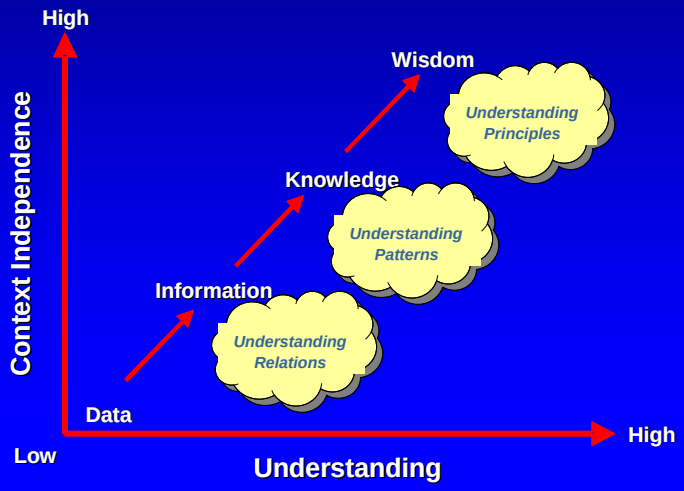
Background

- Learning Objects (LOs) and Knowledge Objects (KOs) are essential building blocks for learning and performance.
- The relationship between KOs and LOs is not very well understood.
- Three possible LO-KO relationships are
  - KOs are equivalent to LOs.
  - KOs are structural components of LOs.
  - KOs are separate, unrelated entities.
- There is an need to define KOs, their components, structure, and relationship to LOs.

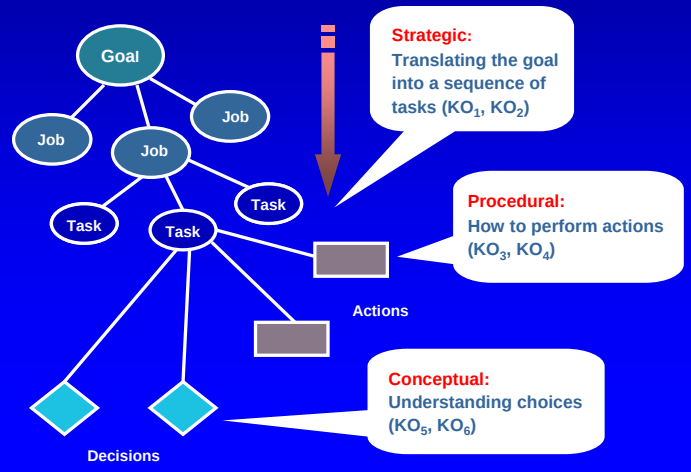
Research Questions

- What are the characteristics of, and differences among, KOs and LOs?
- How can our experience with LOs be leveraged to developing and using KOs?
- What are known best practices for developing and deploying KOs?
- What are known best practices for converting KOs to LOs and LOs to KOs?

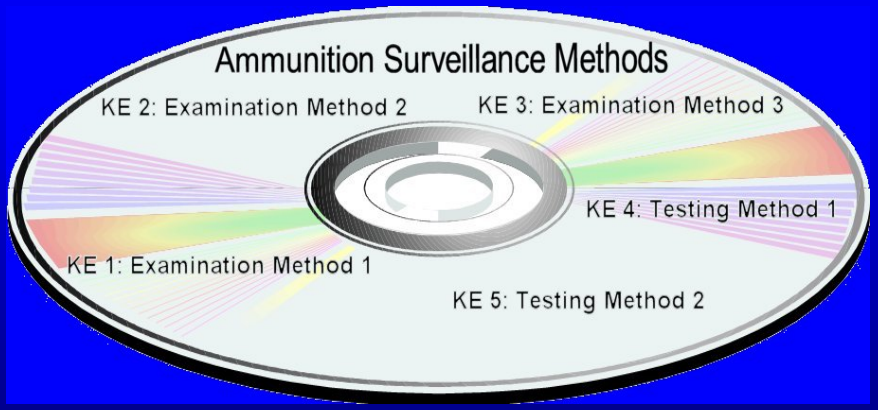
Literature Review



Gene Bellenger



William Horton



David Merrill

Literature Review (cont'd)

An interrelated set of data, information, knowledge, and wisdom.

Bellenger

A digital object consisting of structured and organized content but without instructional features.

Merrill

A chunk of individually accessible digital content that accomplishes a single goal.

Horton

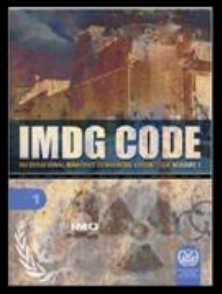
Lessons Learned

- ✓ LOs and KOs are structurally and functionally inter-related digital objects with some differences.
- ✓ KOs can be augmented to create LOs, and LOs can be decomposed to become KOs.
- ✓ LOs and KOs should be developed initially to be relatively context free to increase their reusability.
- ✓ Structured KOs should be developed and managed in an object-oriented repository.

Real-life Example

LO

Information Objects

KO

HAZMAT Transportation Context

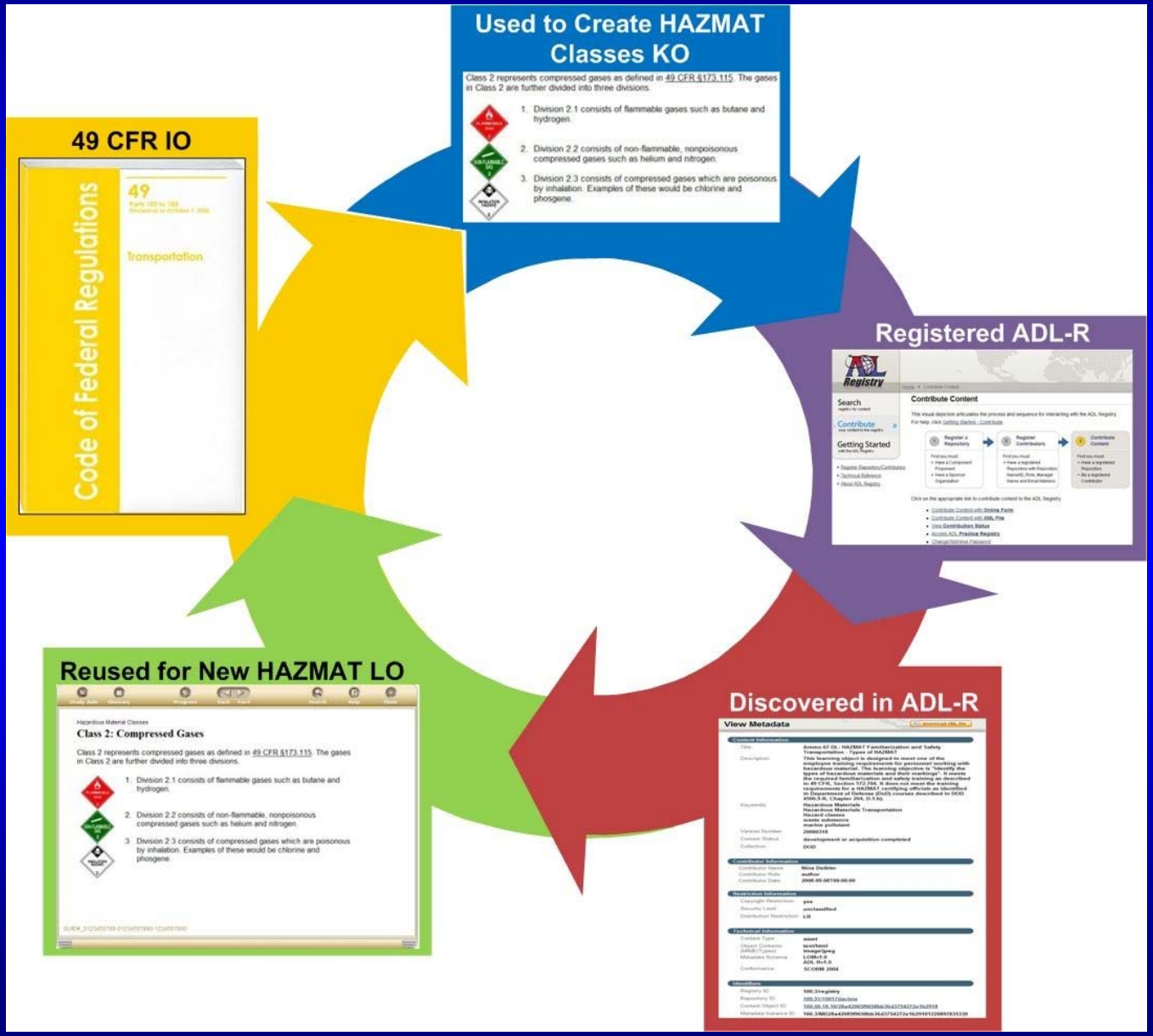
Learning Objective
Select the proper publication for the specified mode of transportation.

Instructional Strategy

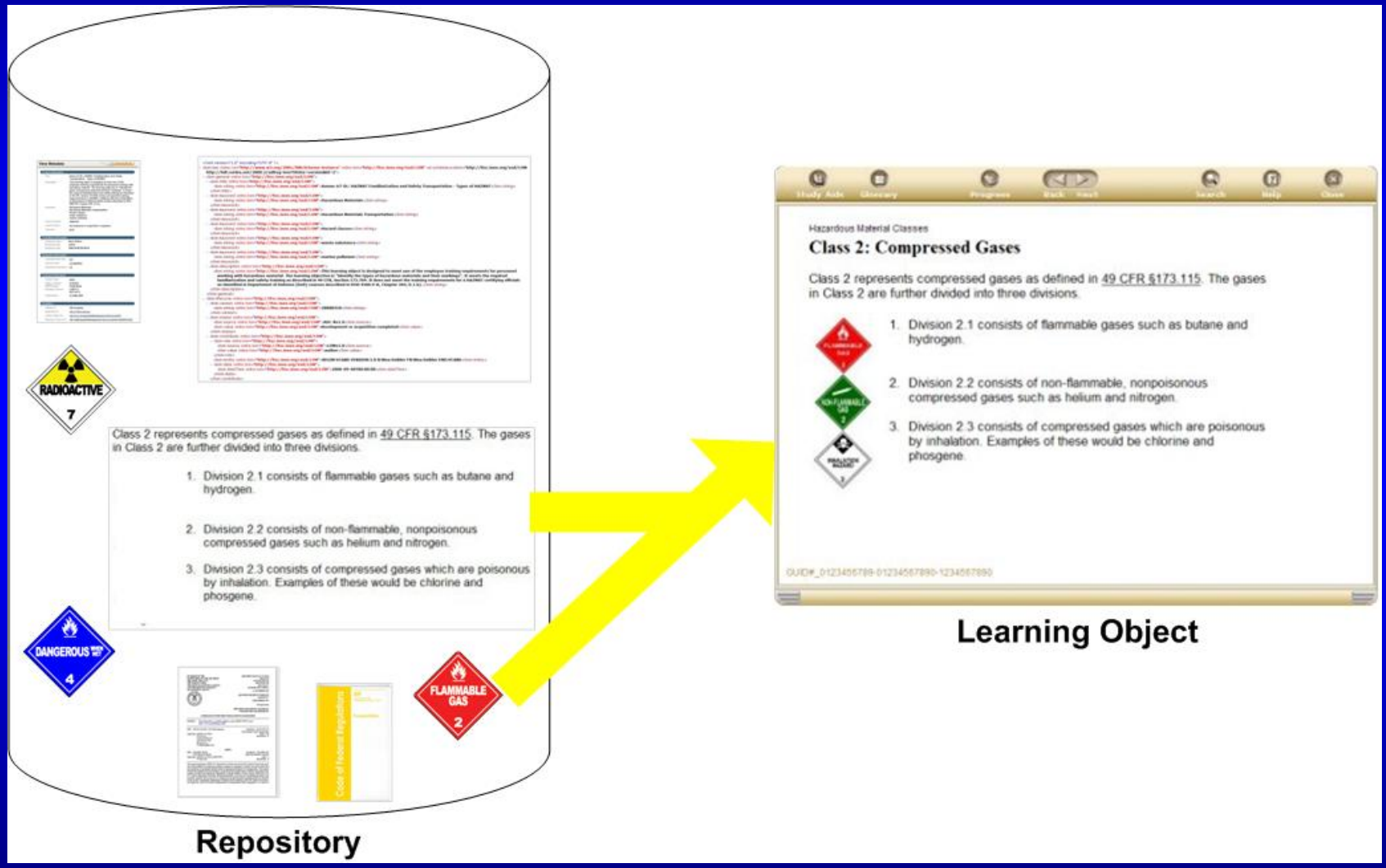
Learning Activities

Assessment Activities

Real-life Example (cont'd)



Real-life Example (cont'd)



Conclusion

LOs and KOs

are birds of a feather

and

not different species altogether.

QUESTIONS?

Here's our contact information…

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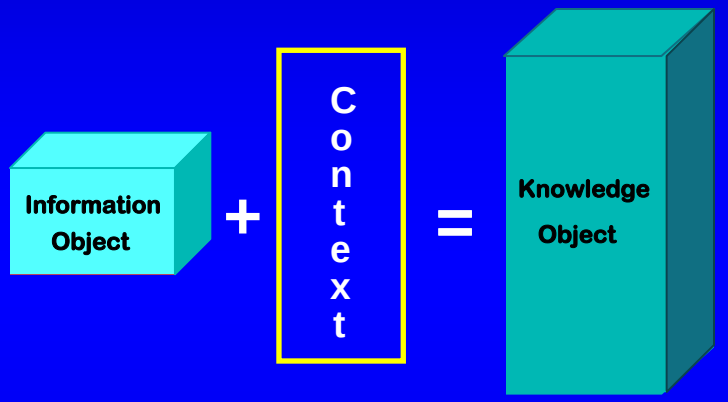
Back-Up Slides

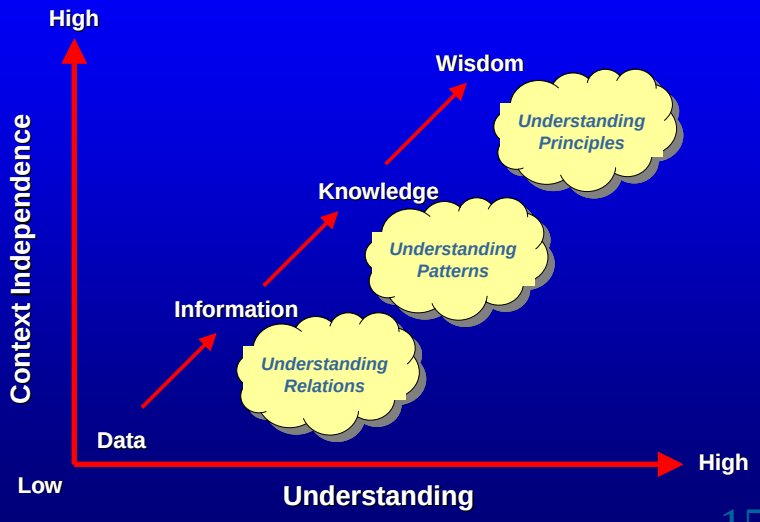
Learning Objects: Some Definitions

Definition	Source
Any digital or non-digital entity for learning, education or training	LTSC, 2002
A small, self-contained unit that can be aggregated and meta-tagged	WORC, 2000
Any digital resource that can be reused to support learning	Wiley, 2000
A modular, uniquely identified and meta-tagged digital resource to support learning	NLII, 2008

Gene Bellenger

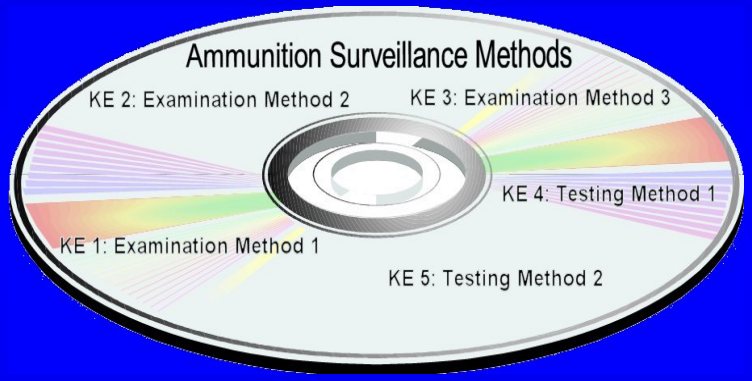
- A KO is an inter-related set of data, information, knowledge, and wisdom.
- A KO an information object that has been meaningfully contextualized.
- A KO It is most valuable with high context independence and high understanding.



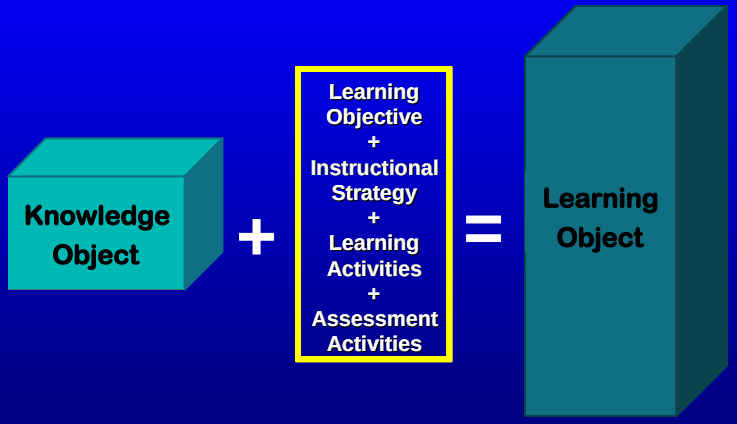


David Merrill

- A KO is a digital object consisting of structured and organized content without any instructional features.
- A KO has compartments for different knowledge elements (KEs).

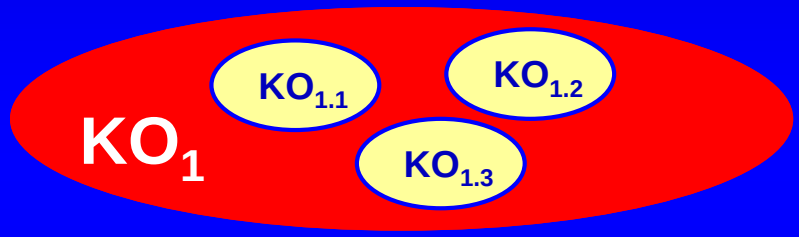


- Adding instructional features to a KO can produce an LO.

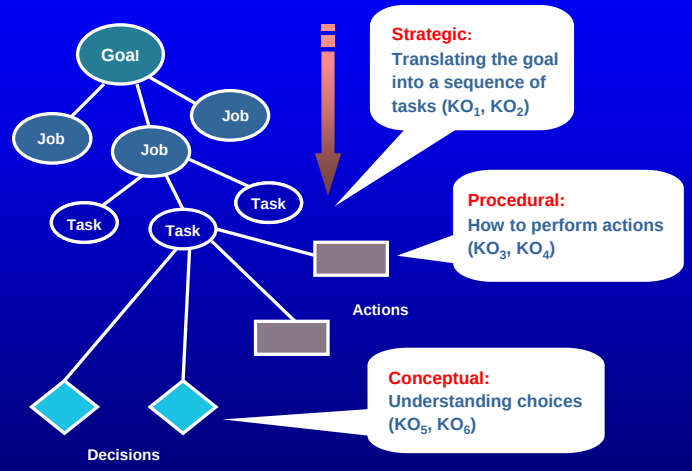


William Horton

- A KO is a chunk of individually accessed electronic content that completely accomplishes a single goal.
- A KO can be part of a larger KO and can in turn include smaller, subordinate KOs.



- Effective use of KOs required understanding of tasks and knowledge required to perform a job.



Terminology

Adopt the following definitions:

- **Information Object**

  A granular, reusable chunk of data or reusable digital content a user can access directly that contains no context or associated learning objective, activities, strategy, or assessment.

- **Knowledge Object**

  A highly structured and interrelated chunk of contextualized content that contains no associated learning objective, activities, strategy, or assessment.

- **Learning Object**

  A collection of IOs and KOs with meaningful context, and with associated learning strategy, activities, and assessment that support a learning objective.

Processes

- Consider the potential use of **KOs as LOs**, and **LOs as KOs** early in the design process.
  - KOs can be augmented to create LOs, and LOs can be decomposed to become KOs.

IO
+ Context
KO

KO
+ Learning Objective
+ Instructional Strategy
+ Learning Activities
+ Assessment Activities
LO

Processes

- Ensure LOs and KOs have appropriate content and structure, which may involve
  - Changing the content development processes.
  - Retraining of content developers and KM personnel.
  - Creating content with relatively low levels of context (users assign meaning later).
  - Shifting the focus of design and development efforts from “course development” to the development of highly granular objects that could serve as KOs when appropriate.

Categorization and Discoverability

- Facilitate the discoverability, usability, reusability, and conversion of KOs and LOs by
  - Developing a standard metadata schema based on the IEEE LOM and a standard metadata vocabulary.
  - Registering LOs and KOs in the ADL Registry.
  - Storing LOs and KOs in a central, web-based repository.

Technical Format

- Include metadata directly in the structure of the KOs.
- Author KOs and LOs using a standard XML content schema such as DITA or S1000D.
  - Allows more control over output formats as well as integration of metadata.
- Develop and manage structured KOs in an object-oriented repository.
  - Enables dynamic assembly at the time of need.