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## **ADL Vision: Reusable and Interoperable Content**

At the heart of the ADL vision is a specification for creating “content objects,” supported by the Sharable Content Object Reference Model (SCORM®).



Each Sharable Content Object (SCO) stands alone instructionally, may be used in multiple learning environments, and may be delivered through multiple delivery systems. SCOs can be stored individually and aggregated to be re-used in new courses.

This interest in reusable and interoperable training guided the collaboration of key U.S. Navy stakeholders and *CTC* in the development of an oil spill prevention training prototype that can be modified and re-used for any personnel operating critical oil-carrying systems onboard Navy ships.

## **U.S. Navy Systems-Level Oil Spill Prevention Training**

The prohibitive cost of developing content for each ship hull led to a ship class approach, identifying systems that are similar enough for content to be shared across ship classes. The Navy carried out an analysis and populated a matrix showing system similarities across ship classes. Initial development proved the concept by creating content for eight oil-carrying systems for each of two ship classes, with one shared lesson. If all courses represented by the matrix were developed, 22% of the training would be SCOs reused in multiple courses, leading to efficiencies and cost savings.



# Reusable Content

Based on the systems matrix, a “library” of lessons for two ship classes (DDG-51 and CG-47) was developed. Each lesson is an individual SCO. These SCOs were combined into courses – one for DDG-51 and one for CG-47. To provide context for the context-neutral SCOs, an introduction for each course was also developed.

The systems matrix identified one oil-carrying system similar between DDG-51 and CG-47. This lesson could therefore be shared by the two courses — true reuse of the training material. The only difference in the presentation of this lesson’s content is the Learning Management System (LMS) course identification, providing context.

Figure 1: Reusable Content from the Lube Oil Fill and Transfer Lesson Presented in the DDG-51 Course

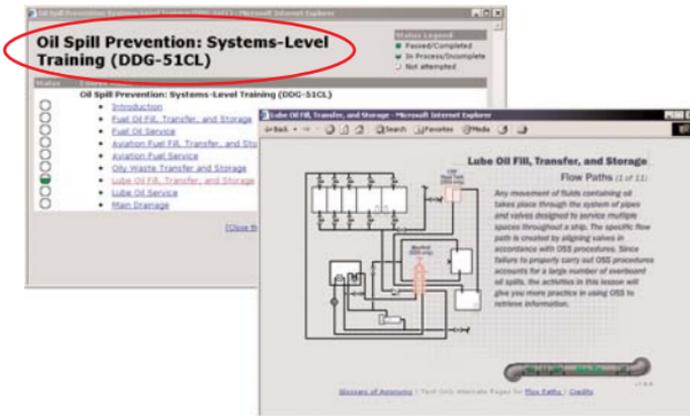
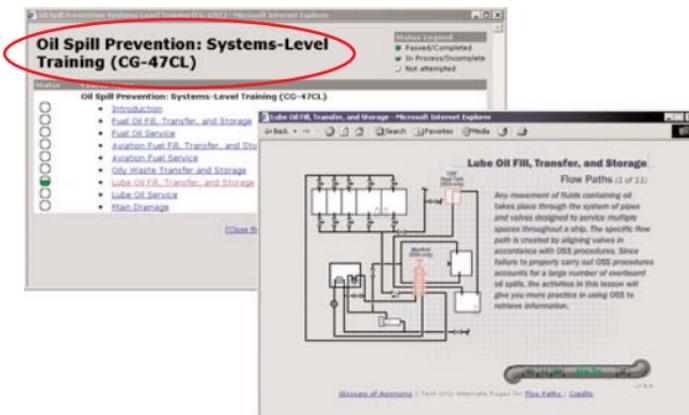


Figure 2: Identical Content from the Lube Oil Fill and Transfer Lesson Reused in the CG-47 Course

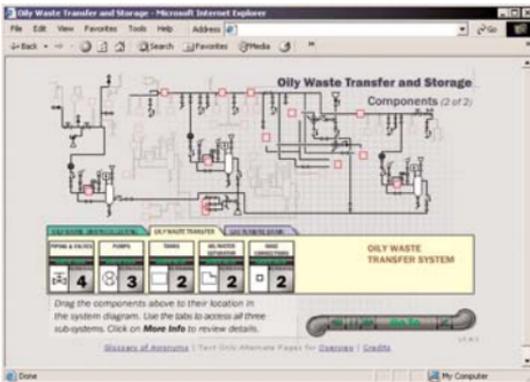


## Interoperable Content

U.S. Navy ships currently require the delivery and management of computer-based training from standalone workstations. Navy schools onshore require the same training to be delivered online. To achieve interoperability, *CTC* used a development process that supports dual deployment: content that works in both Web-based and CD-ROM delivery environments with no retrofit.

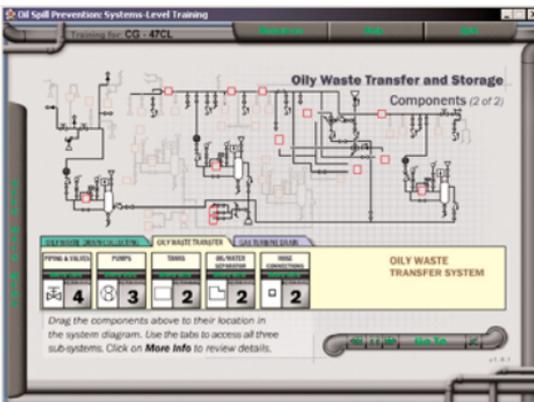
The Web-based version is delivered by an LMS, such as Navy E-Learning. The LMS provides administration and management, including support for user registration, login, lesson selection, lesson completion tracking, and help with using the LMS.

Figure 3: Interoperable Training Disseminated via the Web



The CD-ROM version uses a software “shell” to house the same lesson content. This shell mimics an LMS by managing all the SCOs and allowing for some basic tracking of progress.

Figure 4: Interoperable Training Disseminated via CD-ROM



## Lessons Learned

The decision to develop to the SCORM resulted in rethinking traditional instructional design choices. Knowing that individual lessons (each one a SCO) might be “lifted” and used in other courses prohibited linking them logically with “what you studied in the last lesson” or “what you will see next.” In addition, not knowing which SCO a user might start with, it was not possible to “build” upon concepts or facts introduced in other lessons. This non-linear mindset became essential for designers working on this project.



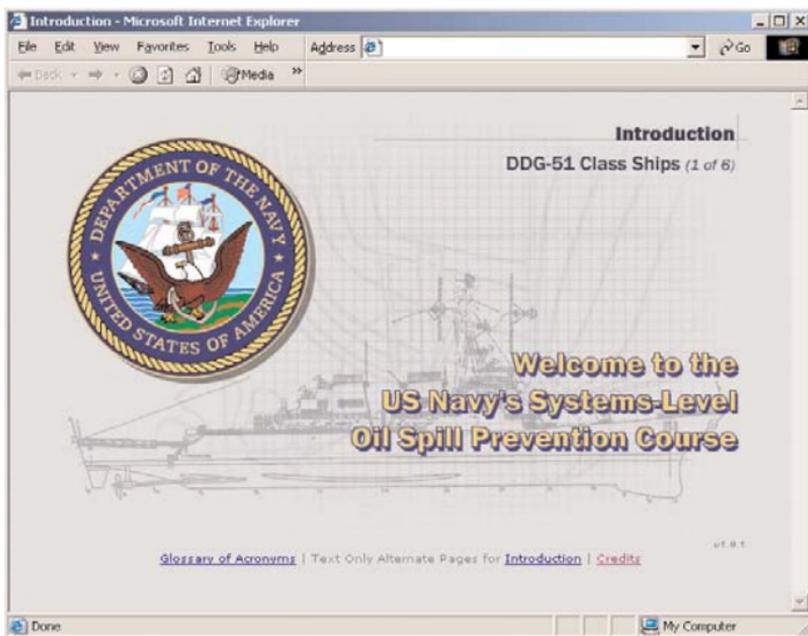
### Other lessons learned:

- Potential for reusability is highest within a fairly closed community of end-users, such as colleges, hospitals, or military organizations.
- The size of a SCO must be defined in the initial design phase. In this project the systems matrix determined sharable material and therefore, the size of a SCO.
- Cost savings on SCORM conformant content occurs in the development phase, not in analysis.
- Providing context-specific training is possible without “contaminating” the context-neutral content. In this project, a context-specific introductory lesson was aggregated with each course.

## A Navy Success Story

The Navy's Systems-Level Oil Spill Prevention Training is a showcase for the successful achievement of several goals of the ADL Initiative:

- Identification of specific material with the potential to be shared – facilitated in this project by the systems matrix
- Use of SCORM as the guideline for development
- Creation of truly reusable and interoperable SCOs
- Proven interoperability with CD-ROM and Web-based versions
- Collaborative effort between the customer and the development community



The U.S. Navy's training strategy to reduce oil spills from Navy ships is the product of coalitions among key Navy stakeholders:

- Naval Facilities Engineering Command (NAVFAC)
- Navy Sea Systems Command (NAVSEA)
- Chief of Naval Operations Environmental Readiness Division (CNO N45)
- Naval Education and Training Command (NETC)
- Engineering Field Activity Northwest (EFANW)



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