S1000D Support for Training:  
*SCORM Overview, The Bridge Project and Learning Content Demos*  
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Agenda

• ADL – MOU with S1 Council, Purpose

• Understand basic Sharable Content Object Reference Model (SCORM Specification)
  – Concepts
  – Terminology
  – Way Ahead

• Understand S1000D to SCORM Connection

• Bridge Project discussion: problem statements, tasks

• Bridge Project open source demos:
  – SCO Workbench, Transformation Toolkit, ECP Web Service
ADL – S1000D Council Memorandum of Understanding

Signed March, 2011
• **Main MOU Points:**

  • Continued refinement of technical training support in S1000D.
  • Continued harmonization of S1000D and SCORM that leads to data readiness and learning content management cost savings.

• **Current MOU-based Activities**

  • **Bridge Project** – demonstrating shared markup, API and open source tool development packaged to improve life cycle management of technical training content.

  • **Naval Postgraduate School Request for Proposal (Monterey, California)** – Acquisition research on impacts of using the ASD specs for defense acquisition management and integrated data environments. Create framework for S6000T (Manpower, personnel and training needs analysis mapped to systems acquisition). Proposal submitted. Decisions expected Sept 2011.
Training Analysis in System Acquisition

Acquisition Logistics Main Business Processes

Acquisition logistics management
(according to NATO Acquisition Logistics Workshop of 1993)

Operational & Maintenance Data Feedback – Functional coverage by S5000F

Design of Systems and Support Equipment

Logistic Support Analysis

Provisioning

Order Administration

Technical Documentation

IN SERVICE
USE

S6000T – TNA
Provide access to the highest quality education and training, \textit{tailored to individual needs}, delivered cost effectively, anywhere and anytime.
Advanced Distributed Learning Initiative (ADL)

- Founded in 1997: standardize and modernize training delivery for U.S. Department of Defense (DoD)
  - Develop and implement learning technologies for DoD and the federal government
  - Collaborate with government, industry, and academia to promote international specifications and standards for designing and delivering learning content
  - Operate under the direction of the DoD Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R)
High Level Requirements

• The “ilities”
  – Accessibility
  – Interoperability
  – Durability
  – Reusability
• Enable Personal Learning Assistant (PLA)
• Address legacy architecture gaps
A Little History - SCORM®

- De facto global learning standard
- Initiated in 1997
- Packaging Content
- Describing Content w/ Metadata
- Run-Time Environment
- Sequencing & Navigation
SCORM Functions: Basics

Sharable Content Object Reference Model (SCORM)

– Exchange courses between Learning Management Systems

– Reuse content pieces across different courses

– Track a learner’s progress through computer-based instruction

– Sequenced content tailored to the learner
• Electronic representations of media such as text, images, sound, or any other piece of data a web client can deliver (simply...an asset is an electronic file).

  – A data module would be an asset.

• The most basic building block of content

• Can be reused in many different contexts and applications
Sharable Content Object (SCO)

- SCO: one or more collected assets that become an independent, defined piece of instructional material

- The smallest logical unit of information you can deliver to your learners via an LMS
  - In technical terms, a SCO is defined as the only piece of information that uses the SCORM Application Programming Interface (API) for communication with an LMS.
Aggregation

• Referenced collection of related content into SCOs

• Used to group related content for sequencing so that it can be delivered to learners in the manner you prescribe
Sequencing

- Ability to prescribe the way learners receive content in an interoperable manner
Content Package

• A standardized, interoperable way to upload content to a SCORM-conformant LMS
Legacy Analogy
• For information on ADL and SCORM:

– **Web site** - www.adlnet.gov
– **YouTube** –
  http://www.youtube.com/user/ADLInitiative
– **Twitter** - @ADL_Initiative
– **LinkedIn** – http://linkd.in/c0iegQ
S1000D to SCORM Connection:

Why Use S1000D for Technical Training Content?
SCORM Standardization Facts

• No asset (file) naming convention
  – No equivalent “DMC”
  – SCORM is used for *any content*

• No XML markup for content
  – Content is used in any format of choice

• No defined way to “chunk” information
  – No business rules to define what is “re-usable”

These facts are “intentional”
• Technical learning content is based on “authoritative sources” (technical publications)

• Technical learning content must be “maintained” as the product and the technical data change

• Technical learning content is out date quickly if links to authoritative sources are not “maintained”

• Costs go up when “all related technical content” are not maintained by a common specification
Why Use S1000D for Technical Training Content?

• Technical training must be configured to systems and technical data

• DMC file naming rules promotes content management for technical learning

• IndentAndStatus provides system-specific meta data

Let S1000D be the regulating format for technical learning content AND authoritative source technical publications
S1000D and the Learning Data Module (LDM) Code

- Apply a “Learn Code” and “Learn Event Code” at the end of the data module code
  - “Learn Code” describes the “instructional purpose” of the training content.
  - “Learn Event Code” describes the branch of the LDM used

- DMC keeps authoritative source and training content “synchronized” in the CSDB.
## Comparing SCORM to S1000D

<table>
<thead>
<tr>
<th>Function</th>
<th>S1000D</th>
<th>SCORM 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregation</td>
<td>S1000D - PubModule, scormContentPackage, SCO DM</td>
<td>IMS Manifest</td>
</tr>
<tr>
<td>Sequencing</td>
<td>S1000D - Process Data Module</td>
<td>IMS Simple Sequencing</td>
</tr>
<tr>
<td>Granularization and Reuse</td>
<td>S1000D - Data Modules</td>
<td>Sharable Content Objects</td>
</tr>
<tr>
<td>Meta Data</td>
<td>S1000D - &lt;idStatus&gt;, &lt;pmStatus&gt;, &lt;scormContentPackageStatus&gt;</td>
<td>Learning Object Metadata (Institute for Electronics and Electrical Engineers, LOM)</td>
</tr>
<tr>
<td>Content</td>
<td>S1000D- Learning Data Modules</td>
<td>No reference to content and format</td>
</tr>
<tr>
<td>Reporting and Interfacing</td>
<td>S1000D- Data and communication protocol not specified</td>
<td>IEEE ECMA Script API for Content-to-Runtime Services Communication</td>
</tr>
</tbody>
</table>
The International Bridge Project

Objectives, Problem Statements, Vision Statement, Tasks
Problem Statements

1. Training needs analysis inconsistently applied during acquisition (requirements output)

2. Technical data and training formats not aligned or linked (XML output)

3. Training content tools not integrated into shared databases (API connections)

4. Difficult to know all data associated to system changes (Life cycle management)

Insurance

Traceability

Synchronization
Identified Gaps
RTOC Bridge Project: Core Open Source Tools

- **S1000D Bridge Application Programming Interface (API)**
  - Enables training development tools access to CSDBs.
- **S1000D Learning Content Editor: AIM and SCO Workbench**
  - Enables courseware planning and organization; learning data module creation
- **S1000D Transformation Toolkit**
  - Converts S1000D LDMs/DMs to SCORM, mobile & PDF
- **S1000D Bridge DM Life Cycle Management Service**
  - Identifies all LDMs/DMs in a CSDB linked to a system change proposal
S1000D Bridge API
Bridge API

- Specified web service-based communication protocol
  - Expose a set of standard communication protocols for interface with a CSDB Mgmt System
  - Any application needing access to S1000D data – our focus has been learning content authoring tools
- First draft of specification completed – looking for external reviewers
- Pursuing submission to OASIS
  - (under the PLCS Technical Committee?)
Bridge API

• Common general purpose “functions”
  – Connecting, disconnecting, searching, retrieving

• Testing environments
  – Open Source - SCOWorkbench
  – Government - Navy’s Authoring Instructional Materials
  – Industry - Contenta & Corena

■ **Status** – Draft complete. In internal review. Public review wanted.
Demonstrations
SCO Workbench
  – Building support for S1000D authoring
    • Courseware training plans
    • Courseware content
    • Courseware assessments
S1000D Transformation Toolkit
• Open source S1000D Transformation Toolkit
• Current transformation support
  – S1000D SCPM to SCORM 2004 3rd Edition Content Packages
  – S1000D to Mobile Platform (Android, IPhone)
  – S1000D SCPM to PDF
  – Java-based toolkit
  – Documentation

• **Status** – code and documentation available on SourceForge (http://s1000d-scorm.sourceforge.net)

  ■ **Status** – Mobile S1000D Bike Course available at https://s1000dbikemobile.appspot.com
S1000D Bridge DM Life Cycle Management Service
• Used to locate all DMs associated with a design change
• Uses DMRL to create system tree view
  – Uses SNS for each node
• Ability to select any node for targeted DM query
• Location: http://sourceforge.net/projects/s1000dscorm-lcs/
Thank you!

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