Structured Markup to Improve Learning Content Development Environments:

*Bridge API and Open Source Tools for Instructional Developers and Life Cycle Managers*

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Agenda

Supporting the Development, Management and Delivery of Distributed Learning

- ADL – MOU with S1 Council, Purpose
- 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 Points:

What is S1000D?
An international specification for the procurement and production of technical publications. It is an XML specification for preparing, managing, and using equipment maintenance and operations information.

It provides structured markup. For example…

<lctaskitem>
<description>
<para>Describe the Sharable Content Object (SCO) concept, and identify the three defining characteristics of a SCO.</para>
</description>
</lctaskitem>
• **Who signed the MOU:**
  - Aerospace and Defense Industries of Europe (ASD)
  - The Aerospace Industries Association (AIA)
  - The Air Transport Association (ATA)
  - Advanced Distributed Learning (ADL)

• **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 BAA – Proposal Submitted** – Acquisition research on impacts of using life cycle standards for defense acquisition management and integrated data environments. Create unified methods for creating training and maintenance requirements.

  • Ten tasks, two years.
S1000D to SCORM Connection:

Why Use S1000D for Technical Training Content?
Facts About SCORM

• 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”*
Facts about Technical Learning Content

- Technical learning content is based on “authoritative sources” (technical publications, eng drawings)
- 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?

- S1000D: An XML-based specification that chunks technical data and learning assets into reusable content.

- Helps technical training to be configured to systems and authoritative content through metadata. <IdentAndStatus>

- File naming rules promotes content management for technical learning – The Data Module Code

Let S1000D be the regulating format for technical learning content AND authoritative source technical publications
# 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>
Supporting the Development, Management and Delivery of Distributed Learning

(ADL Insights Announcement about Bridge Project distributed June 6:  
http://ymlp.com/zK5nbq)
Problem Statements

1. Training needs analysis inconsistently applied during acquisition (front-end analysis output)

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

Ensure Data
Trace Data
Synchronize Data
Identified Gaps

Diagram illustrating the process from "EDIT" to "PUBLISH" with various tools and systems involved, including LDM/SCPM, DM/PM, CSDB, PLCS (ILS), SCORM, LMS, and IETM Viewer.
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 common source database.
  - Any application needing access to S1000D data – our use case has been on learning content authoring tools
- First draft of specification completed
- Pursuing submission to OASIS
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.
Life Cycle-based Demonstrations:

Authoring
Publishing
Maintaining
Authoring: SCO Workbench
Authoring SCO Workbench

- SCO Workbench – Tool for developing SCORM content (open source - http://www.openscorm.org/wiki/)
  - Building support for S1000D authoring
    - Courseware training plans
    - Courseware content
    - Courseware assessments
Publishing:
S1000D Transformation Toolkit
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 http://s1000d-scorm.adlnet.gov/JQueryMobileTest3/ (or https://s1000dbikemobile.appspot.com)
Maintaining Distributed Learning Content:

S1000D Product Data Identification 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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