S1000D Content Workflow

S1000D Webinar Series, Session 2
SDL Structured Content Technologies Division
Our Presenters Today

Rhonda Wainwright
S1000D and IETM Specialist
SDL
Structured Content Technologies

Harvey Greenberg
XML Evangelist
SDL
Structured Content Technologies
Objectives

- Provide a review of basic S1000D concepts
- Show how S1000D information requirements are developed
- Provide an understanding of how S1000D content and metadata are created and managed
- Discuss how content is interchanged with partner companies
- Describe how publications are built and delivered
- Explain how S1000D content is updated
S1000D: The Big Picture (Webinar 1 Review)

Understanding the Data Module Code (DMC)
  - Building the Standard Numbering System (SNS)

Building the Data Module Requirements List (DMRL)

Data Modules: Authoring S1000D Content
  - S1000D Metadata
  - Content
  - Referencing mechanisms

Publication Modules: Publishing S1000D Manuals

Data Interchange using a Data Dispatch Note (DDN)

Updating S1000D Content and Managing Revisions
Unlike most legacy document types, S1000D is topic based

- Content is not specifically tied to a publication, thus promoting reuse and single sourcing

But unlike other topic-based models (e.g. DITA) S1000D content follows strict naming conventions, indicating

- The component to which it applies
- The purpose of the information

S1000D has a built-in mechanism for data interchange

- Interchange is based on data modules
- Eases the import and export processes from CSDB to CSDB
Applying Content to Component

System, subsystem, . . .

Data Module

- B-777
  - Airframe
  - Engines
  - Flight Controls
    - Ailerons
    - Rudder

- Engine Start Checklist
- Parts List
- System Description
- Alignment Procedure
Publication Module for Repair Manual (Print/PDF)

Data Modules

Publication Module for Interactive Electronic Product

= Cockpit radio remove & replace procedure reused for multiple products
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Updating S1000D Content and Managing Revisions
<table>
<thead>
<tr>
<th>MI</th>
<th>Model Identification</th>
<th>As assigned by or registered with NATO Maintenance and Supply Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDC</td>
<td>System Difference Code</td>
<td>Identifies alternative versions of sys/subsys/subsubs sys (SNS)</td>
</tr>
<tr>
<td>SNS</td>
<td>Standard Numbering System</td>
<td>Physical breakdown of a product by System-Subsys/SubSubsys-Assembly Code</td>
</tr>
<tr>
<td>DC/DCV</td>
<td>Disassembly code and Variant</td>
<td>Designates alternative components differing slightly in design, but not enough to warrant a new SDC</td>
</tr>
<tr>
<td>IC/ICV</td>
<td>Information code and variant</td>
<td>e.g., description &amp; operation, illustrated parts, wiring, etc.</td>
</tr>
<tr>
<td>ILC</td>
<td>Item location code</td>
<td>e.g., on ship versus on shore</td>
</tr>
<tr>
<td>LC/LEC</td>
<td>Learn code/learn event code</td>
<td>e.g., demonstration/lesson plan</td>
</tr>
</tbody>
</table>

*From S1000D Issue 4.0*
The Standard Numbering System

The SNS is the portion of the DMC that identifies the physical breakdown of the Product

- System
- Subsystem
- Subsubsystem
- Unit or Assembly

Example:
- 12 (Braking System)
- 2 (Parking Brake)
- 0 (Master Cylinder)
- 03

Each level is assigned a unique code; combined, they identify a specific component and are used in the DMC (e.g., 12-20-03 for the master cylinder assembly above)

S1000D provides generic and “maintained” SNS for land, sea, and air systems as well as other example SNSs

Projects must decide which SNS to use and what modifications are needed
SNS for General Purpose Vehicle

Model

Your model identification code

System

Propulsion
A0

Structure
B0

Armaments
C0

Subsystem

General
00

Installation
10

Control Panel
20

Subsystems and unit or assembly to be completed by project
## SNS Application

<table>
<thead>
<tr>
<th>What data module pertains to</th>
<th>SNS within the data module code</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information about the vehicle</td>
<td>00-00-00</td>
</tr>
<tr>
<td>General information about the armaments system</td>
<td>C0-00-00</td>
</tr>
<tr>
<td>Procedure to repair armaments system control panel</td>
<td>C0-20-00</td>
</tr>
<tr>
<td>Wiring diagram for some component within the control panel</td>
<td>C0-20-A8</td>
</tr>
<tr>
<td>(assuming additional codes developed and defined)</td>
<td></td>
</tr>
</tbody>
</table>

Complete DMC for wiring diagram: HUMVEE-AAA-C0-20-A8-0000-051-A
SNS for Combat Vehicle System

*From S1000D Issue 4.0*
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Essentially, doing what we just did a thousand times!

But seriously, the data module requirements list represents the complete information set needed.

A DMRL can be created in the CSDB or may come from other systems such as an LSA (Logistic Support Analysis) system.

The DMRL itself is an XML file as described in the S1000D specification.

Alternatively, some CSDBs will allow the DMRL to be created in other machine readable formats such as CSV (Comma Separated Values) and imported.
Now let’s look at how this is accomplished...

DMC Management Tools in the CSDB
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Updating S1000D Content and Managing Revisions
Each data module consists of metadata and content

Metadata (in Issue 4.0 `<identAndStatusSection>`) is identical for every data module

Content (`<content>`) varies depending on which tree of the schema you need for the particular module.

<table>
<thead>
<tr>
<th>Descriptive</th>
<th>Procedural</th>
<th>Fault isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance planning</td>
<td>Crew/operator information</td>
<td>Illustrated parts</td>
</tr>
<tr>
<td>Battle damage assessment/ repair</td>
<td>Wiring data</td>
<td>Process data module</td>
</tr>
<tr>
<td>Technical information repository</td>
<td>Container data module</td>
<td>Learning data module</td>
</tr>
<tr>
<td>Maintenance checklists and inspections</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
dmodule

identAndStatusSection

content → description (para/subpara-like elements)
procedure (step/substep-like elements)
Other data module types with their required markup
S1000D metadata is extremely rich, and much of it is required

- For example: issue number, inwork, security classification, quality assurance, language
- Many of these will be tied to workflow and defined specifically in the project’s business rules

Other metadata is descriptive

- For example: data restrictions or reason for change
- Use should also be defined in business rules
- Data module creation process ensures consistency

Publication module (and more about this will follow) has its own metadata section analogous to that of data modules
References take on critical importance with S1000D, particularly given:

- Smaller granularity
- Reuse
- Needs of electronic information consumers

References can be made to:

- Other data modules using their DMC
- Legacy publications (print/electronic)

Referencing is a great way to reuse existing information rather than duplicating content.

One of the most significant benefits of a CSDB is to facilitate reference creation and ensure referential integrity.
Reference Validation in CSDB

Great news

Not so great
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Speaking of references…

- **The Publication Module**
  - Is the organizing construct for data modules and/or legacy publications
  - Has a metadata section similar to DM

- **The Publication Module is essentially a collection of references** within multi-level containers that define the outline of the publication

- **Some CSDBs have tools that allow “drag and drop” creation of a Publication Module**
  - Otherwise, Publication Modules must be created from scratch using an XML Editor
Visual Representation of a Publication Module

Selecting Data Modules into the Tree View
Publishing involves exporting the Publication Module and all associated assets (Data Modules, graphics, multimedia, legacy publications, etc.) to an S1000D-aware rendering application.

- A good CSDB will provide a multi-channel publishing “Print Button” that allows you to publish to PDF/Paper and IETP simultaneously.

Publishing requires the same level of configuration control as authoring, and the CSDB should provide functionality to:

- Track versions of Publication Modules per the S1000D specification.
- Keep track of all the different deliverables, including which customers are delivered which version(s) and in which format(s).

Publishing can be further enhanced by applicability (which provides for custom manuals based on configuration):

- This will be covered in detail during our next Webinar on S1000D Applicability.
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The Data Dispatch Note (DDN) is a built-in S1000D mechanism for interchanging content with partner organizations

- Subcontractors
- OEMs
- Distributed authoring groups without access to your CSDB

The DDN is essentially a manifest which lists all of the Data Modules and other assets (graphics, etc.) in a delivery package.

A good CSDB will provide the means to easily create a DDN using a forms-based interface

- Otherwise, you will need to create an XML file

Look for a CSDB that allows files to be added to a Dispatch package using drag-and-drop or other simple means.
Illustrative Data Interchange Process

1. Drag and Drop dModules and graphics into a Dispatch package

2. Create the DDN using a CSDB GUI (or alternatively in an XML Editor)

3. DDN, dModules and graphics are exported into a zip file (for example)
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The S1000D specification governs metadata changes, and you are highly encouraged to play by the rules.

- “inwork” is incremented as data module is changed
- “Issue number” is incremented when updated data module is released
- A released data module that is no longer needed is never physically deleted; rather, it is retained in the CSDB with its status marked “deleted”

The challenge is maintaining visibility into the implications of change:

- What publications are affected?
- Where is this module referenced?
- What illustrations need to be changed?
S1000D introduces complexities that at first glance may appear to be daunting.

In reality, though, it provides a framework that makes a lot of sense because it enables automation:

- Encapsulated processes that extend from requirements development to information delivery.
- Allows for considerable flexibility.
- Provides guidance to solve problems you would need to solve anyway, while taking advantage of years of best practice.
- Automates many of the processes needed to produce technical documentation in a controlled way.

While S1000D requires an up front investment for a CSDB, the payoff is likely to be large and can provide considerable return on investment.
Upcoming S1000D Webinars

- **S1000D Applicability – April 2010**
  - Overview of the S1000D applicability model with demonstrations of how applicability filtering is achieved during publishing and in an IETP

- **S1000D IETPs – June 2010**
  - Overview of S1000D IETP functionality as identified in the S1000D Functionality Matrix; demonstrations will be provided to show functionality that can be achieved for the various data module types such as Process Data, Illustrated Parts, Fault Isolation, and Wiring

- **S1000D and Multimedia: September 2010**
  - Hot spots are just the tip of the iceberg; S1000D provides for the use of 3D models, animations, simulations, video, digital photographs, and more; multimedia demonstrations will be provided
Questions?
Thank You for Joining Us

For more information...

- Visit us on the web:  www sdlxxysoft com

- Email
  - Rhonda Wainwright: rwainwright sdl com
  - Harvey Greenberg: hgreenberg sdl com

Join us for our next S1000D webinar...

- S1000D Content Applicability

- Tuesday, April 13, 2010

- To register: