S1000D Transformation Toolkit
Guide for Developers

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CTC Overview

- 501(c)(3) nonprofit established in 1987
- Staff of 1,400+ professionals
- More than 50 locations
- 900,000 sq. ft., including labs & demonstration space
- Top 100 Government Contractor
- Quality/EH&S Management System comprised of industry-best models: ISO 9001 (Quality) and 14001 (Environmental), AS9100 (Aerospace), and CMMI-SE/SW (Systems/Software Engineering)
- Nationally recognized security capabilities with 300,000+ sq. ft. of Top Secret/Sensitive Compartmented Information Facility Space, JWICS, SIPRNet, and NIPRNet access
The Bridge Project

• An OSD-funded project managed by the ADL Initiative.
  – Improves lifecycle management of technical training content.
  – Uses the S1000D technical data specification to manage learning content.

• The Bridge Project enables enterprise training content management:
  – CONOPS: Sets parameters and operational scenarios for an S1000D development environment.
  – Bridge API: Connects learning content development tools to common source databases
  – AIM/SCO Workbench S1000D Support: Authoring tools write directly to S1000D.
  – S1000D Transformation Toolkit
  – Product Data Identification Service: Locates all S1000D based product support data linked to engineering change proposals.

• Cost Benefits Analysis
  – 10% reduction in total ownership cost due to quicker data identification.
S1000D Transformation Toolkit

• Problem Statement Driver
  – There is no interoperable publishing activity that supports the building of multiple delivery platforms from lifecycle-aware learning content formats.

• Solution – S1000D Transformation Toolkit
  – The Toolkit is an open source design that specifically targets developers of technical learning content who have the following requirements:
    • Separation of source data from delivery formats
    • Manage lifecycle and configuration of technical training content;
    • Output source content to multiple outputs (e.g., SCORM and mobile devices)
    • Leverage and build upon open source technologies
Toolkit Overview

- The Toolkit is a black box that consumes S1000D input files and graphics from a Common Source Database (CSDB) and produces a SCORM content package, mobile web application or PDF output.
Toolkit Output

SCORM

MOBILE

PDF
Development Strategy

- Open source – SourceForge  http://sourceforge.net/projects/s1000d-scorm/
  - SVN (Subversion)
- Written as a Java-based library (1.6.0_21)
- Uses Apache Ant v 1.8.2 http://ant.apache.org/
- Uses Apache Commons Chain http://commons.apache.org/chain/
  - Allows for expandability and allow for plug-in support for future desired formats
- XML Style Sheet Translation (XSLT) files
- Cascading Style Sheets (CSS)
- jQuery Mobile Framework  (Mobile Output) http://jquerymobile.com/
- Flying Saucer Project (PDF Output) http://code.google.com/p/flying-saucer/
- Eclipse Project - source includes the Eclipse .classpath and .project files
How Developers Will Use the Toolkit

- Publishing SCORM from an S1000D Compliant Application (CSDB)

- Importing S1000D Content into a Learning Management System

- Independent Application Development
Apache Commons Chain Library

- Ability to add new features to support specific needs
- Apache Commons Chain Library which provides an API that facilitates the Chain of Responsibility design pattern

```xml
<catalog>
  <chain name="SCORM">
    <command name="PreProcess" className="bridge.toolbox.commands.S1000DConverter" />
    <command name="PreProcess" className="bridge.toolbox.commands.PreProcess" />
    <command name="SCOMediator" className="bridge.toolbox.commands.SCOMediator" />
    <command name="PostProcess" className="bridge.toolbox.commands.PostProcess" />
    <command name="Cleanup" className="bridge.toolbox.commands.Cleanup" />
  </chain>

  <chain name="Mobile">
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    <command name="MobileBuilder" className="bridge.toolbox.commands.MobileBuilder" />
    <command name="Cleanup" className="bridge.toolbox.commands.Cleanup" />
  </chain>

  <chain name="PDF">
    <command name="S1000DConverter" className="bridge.toolbox.commands.S1000DConverter" />
    <command name="PDFBuilder" className="bridge.toolbox.commands.PDFBuilder" />
    <command name="Cleanup" className="bridge.toolbox.commands.Cleanup" />
  </chain>
</catalog>
```
Viewer Application

• The Viewer Application is a browser-based rendering environment.
  – XML style sheet translation (XSLT) files along with other files necessary to provide content navigation and other features required for presentation of the content in a Web browser.
  – The viewer is required because the S1000D content is left in its original XML form.

• The Viewer Application contains the files to do the SCORM API communication at runtime.

• Assessments handled with Flash templates
  – (ViewerApplication\Assesment_templates)

• Assessments handled with HTML XSLT files
### Modifying the SCORM Output Images

#### Key

<table>
<thead>
<tr>
<th>Key</th>
<th>Graphic Name</th>
<th>Graphic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>toolkit_header_01.jpg</td>
<td>Bridge Project Header</td>
</tr>
<tr>
<td>2</td>
<td>toolkit_header_02.jpg</td>
<td>Header Background, stretches horizontally</td>
</tr>
<tr>
<td>3</td>
<td>toolkit_footer_01.jpg</td>
<td>Footer, left</td>
</tr>
<tr>
<td>4</td>
<td>toolkit_footer_02.jpg</td>
<td>Footer Background, stretches horizontally</td>
</tr>
<tr>
<td>5</td>
<td>toolkit_footer_03.jpg</td>
<td>Footer, middle</td>
</tr>
<tr>
<td>6</td>
<td>toolkit_footer_04.jpg</td>
<td>Back Button</td>
</tr>
<tr>
<td>7</td>
<td>toolkit_footer_05.jpg</td>
<td>Next Button</td>
</tr>
<tr>
<td>8</td>
<td>toolkit_footer_06.jpg</td>
<td>Footer Background</td>
</tr>
</tbody>
</table>

s1000DToolkit1.0/ViewerApplication/app/images

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Additional Information

This learning is sponsored by the National Bike Courier association.

The NBCA’s mission statement is to promote unity and solidarity within the messenger community and to raise the status of our profession.

This lesson plan describes the learning needs and instructional strategies for teaching the parts of a bike and bike maintenance.

N00174-05-D-0003
Modifying the SCORM Output

• Changing Interface Elements with Different Filename or Type
  – s1000DToolkit1.0\ViewerApplication\app\navPage.htm

• Modifying the Course Style Sheet
  – s1000DToolkit1.0\ViewerApplication\app\common.css

• Modifying Viewer Transformations
  – s1000DToolkit1.0\ViewerApplication\app\s1000d_4.xslt

• Modifying Viewer Navigation
  – s1000DToolkit1.0\ViewerApplication\app\navScript.js
  – List.js created at by Toolkit contains the order of Data Module files
Modifying the Mobile Web Application Output

- jQuery Mobile Framework v 1.0b3
- Performance Support Output (no assessments)
  - s1000DToolkit1.0\xsl\bridge\toolkit\commands\dmStylesheet.mobile.xsl
  - s1000DToolkit1.0\xsl\bridge\toolkit\commands\scpmStylesheet.mobile.xsl
- Full Mobile Course Output (assessments handled with HTML/JavaScript)
  - s1000DToolkit1.0\xsl\bridge\toolkit\commands\dmStylesheetCourse.mobile.xsl
  - s1000DToolkit1.0\xsl\bridge\toolkit\commands\scpmStylesheetCourse.mobile.xsl
- Viewer Application plus some mobile variation found in s1000DToolkit1.0\xsl
- MobiApp
  - Mobile.css, mobileEvents.js, jquery-1.6.2.min.js plus the jQuery Mobile 1.0b3 files
- Note: References to ICN files in the data modules that are Flash files (.swf) are included in the mobile web application output
Modifying the PDF Output

- The PDF module uses the Flying Saucer project. CSS files are used to transform the S1000D XML to PDF.

- s1000DToolkit1.0\cssPDF
  - s1000d_instructor.css
  - s1000d_student.css
QUESTIONS
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