Technical and Managerial Challenges Using S1000D in Practice

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Using S1000D in Practice

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The Challenge

Converting Existing Maintenance Tasks into S1000D Documents

PEOPLE PERSPECTIVE

Client
Boss
Tech Writer
Sales

PROCESS PERSPECTIVE

People
Information
Software

COST PERSPECTIVE

Time
Money
Why S1000D
People Perspective

- Have FAA Approved set of maintenance tasks.
  - engineering drawings
  - tasks documented
  - illustrations done
  - How hard could it be?

- Tech Writer > 10 years
- iSpec 2200 – (Aviation Maintenance)
- AS9100 – (Aerospace Quality Mgt)
- (ICA) Instructions for Continued Airworthiness (FAA)
- Federal Aviation Regulations
- Some Web Page experience
People Perspective

International specification for technical publications using a common source database

S1000D-00603-A1030-00
Issue No. 4.2
S1000D CHAPT 1 – INTRODUCTION TO THE SPECIFICATION

Data Modules stored once ... used for multiple outputs.

“A tech writer’s dream comes true”
People Perspective

S1000D CHAPT 2 – Documentation Process

85 Pages of Business Rules?
10 Categories?

Fig 1. Business rule categories

ICN-83007-S1000D001-001-01
People Perspective

No Additional Requirements Except XML

S1000D CHAPTER 2 – DOCUMENTATION PROCESS
Business Rules (BR) categories

- BR Cat 1 General
- BR Cat 2 Product Definition
- BR Cat 3 Maintenance and Operations Concepts
- BR Cat 4 Security
- BR Cat 5 Business Process
- BR Cat 6 Data Creation
- BR Cat 7 Data Exchange
- BR Cat 8 Data Integrity and Management
- BR Cat 9 Legacy Data
- BR Cat 10 Data Output → XML

Customize S1000D Business Rules to Meet Customer Requirements

- model identification codes
- system difference codes
- material item category code
- SNS specifications
- disassembly code
- diassembly code variant
- applicability rules
- zones
- access rules

Aloft AeroArchitects
People Perspective

Learn XML and new app

WORD --> XML

S1000D Data Modules

Create Publication Module List

MicroSoft WORD

Publication module content
### People Perspective

#### Model Identity Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A319SN5261</td>
<td>Airbus A319, MSN 5261 Completion Project</td>
</tr>
<tr>
<td>A320</td>
<td>A320 Aircraft type</td>
</tr>
<tr>
<td>A321</td>
<td>A321 Aircraft type</td>
</tr>
<tr>
<td>A330</td>
<td>A330 Aircraft type</td>
</tr>
<tr>
<td>A330NEO</td>
<td>Airbus A330neo Aircraft</td>
</tr>
<tr>
<td>A330NEOIPD</td>
<td>Airbus A330neo IPD</td>
</tr>
<tr>
<td>A3502C03FRM</td>
<td>A350 2C03 MONUMENT</td>
</tr>
<tr>
<td>A3502C03SEAT</td>
<td>A350 2C03 SEAT</td>
</tr>
<tr>
<td>A3502C03SHELL</td>
<td>A350 2C03 SHELL</td>
</tr>
</tbody>
</table>

**Just Ask**
People Perspective

S1000D CHAPT 3 – “Same as iSpec 2200”

ATA Specification 2200
(iSpec 2200)

Information Standards for Aviation Maintenance

nothing new....
Communicate Differences

AMMS Tasks

Vs

S1000D Modules
People Perspective

Steep Learning Curve

S1000D REQUIRES INFORMATION “UNDER THE HOOD”

Answer: Schedule Time to Build Templates
People Perspective

Different Views

Client

Data Exchange

Me

Boss

Hanger Ops

Database Admin
Process Perspective

What processes change as a result of delivering .XML documents instead of .PDF?
S1000D is not "Process Driven"
S1000D is not a "How To Guide"
S1000D is a Specification

Answer: Use something else:

DoD HANDBOOK
GUIDE TO THE GENERAL STYLE
AND FORMAT OF
S1000D DATA MODULES

DEPARTMENT OF DEFENSE
HANDBOOK
GUIDE TO THE GENERAL STYLE AND FORMAT
OF S1000D TECHNICAL MANUAL DATA MODULES

MIL-STD-503
31 March 2011

NOT DEPARTMENT
SENSITIVE

This handbook is for guidance only.
Do not cite this document in a performance.

AEROSPACE
AEROARCHITECTS
Process Perspective

Previous Process used MicroSoft Word to create documents

“why can’t you just ”Save As .. Word XML”

WORD is dirty

“No” is a complete sentence.

S1000D Council & Steering Committee Report (S1000D User Forum 2018)
Element and Attributes, Oh My

4.3.9.3.5. ZONDATA ELEMENT

One ZONDATA element is instantiated in order to enable the links to the AMM “Zoning” and “Access List” parts. It contains:

- a PARA element, which describes the linked data,
- two REFEXT elements, whose target manual (REFMAN attribute) is the AMM and the precise target locations (REFLOC attribute) are respectively the ZONING element and the ACCLST element (specific to the A380 SGML data).

4.3.9.4. SAMPLES

4.3.9.4.1. A320 FAMILY, A330/A340 SGML DATA SAMPLE

```
<ZONING CHG="0" KEY="ENZONING" REVDATE="20060301">
<TITLE>ZONING DESCRIPTION</TITLE>
<ZONDATA>
<PARA>Refer to AMM for the <REFEXT REFMAN="AMM" REFLOC="ZONING">Zoning description</REFEXT></PARA>
</ZONDATA>
</ZONING>
```
Process Perspective

Software Available:

XML authoring tools

- XMLSpy ($)
- Arbortext ($)
- Oxygen ($)
- XML Copy Editor
- EditiX ($)
- Stylus Studio

We Chose: FrameMaker
Script Errors

Aji,
Please tell me how to remedy the following errors for the attached file IPCS.fm.
To the best of my abilities have have followed the expected rules of using the S1000D application, and I am not attempting to work around anything. So it would be even more helpful if you could tell me WHICH Rules of using the S1000D application did I violate to create the following errors?

Thank you very much,
Rhonda

1.) Script Error:
Error Message : XML error in line 9
Script, Line# : C:\Program Files [x86]\Adobe\Adobe FrameMaker 2017\startup\s1000dMenu.jsxbin, 153
(this particular error has been reported previously. Was there something that I was supposed to do to prevent it or fix it? )

2.) Fatal Error at file C:\Users\housleyr\Desktop\1264730_003_XML\PCS\PCS.fm.D13, line 9, char 17, Message: Attribute "xmlns:xlink" was already specified for element "pm".
S1000D Requirements

Vs

Out-Of-The-Box FrameMaker

NOT ALL S1000D ELEMENTS ARE AVAILABLE IN FM example proceduralStepAlts

HOWEVER, YOU CAN EXPORT THE ELEMENT CATALOG AND MODIFY IT TO ADD ELEMENTS OR CHANGE EXISTING ATTRIBUTES.

ELEMENT CATALOG AS EDD -> MODIFY -> UPDATE
Process Perspective

FrameMaker
Software
Service and Support

THE Best!
Process Perspective

Customer Project
Program Management,
Sharing Information
Communications
Issues Tracking
Status Reporting
Evolve, Reuse
Process Perspective

Store Data Files on the DESKTOP to avoid some FM errors?

Validation (Data) from Doc to XML?
Document Approval Process?
Cost Perspective
## Cost Estimate

“Managing Your First S1000D Project” by Sandra Urias

Pg 61

Here are some general statistics from that project:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate equipment and software costs:</td>
<td>$250,000</td>
</tr>
<tr>
<td>Project Duration</td>
<td>3 years</td>
</tr>
<tr>
<td>Number of data modules produced:</td>
<td>~ 3,000</td>
</tr>
<tr>
<td>Number of illustrations produced:</td>
<td>~ 6,000</td>
</tr>
<tr>
<td>Number of full time persons:</td>
<td>~ 4 full time persons for project duration</td>
</tr>
</tbody>
</table>

S1000D Council & Steering Committee Report (S1000D User Forum 2017)
Cost Perspective

“How much does a license for Adobe FrameMaker 2017 release) cost?”

The full version of Adobe FrameMaker (2017 release) costs US $999.

“How much does it cost to upgrade to Adobe FrameMaker (2017 release) from previous versions?”

To upgrade from one version back to FrameMaker (2017 release): US $399.

To upgrade from two versions back to FrameMaker (2017 release): US $599.

†Prices listed are the Adobe direct store prices. Actual price can vary depending on the country and currency of purchase, product language, and applicable local taxes.
Cost Perspective

Time – approximately 6 weeks [AMMS & IPCS]
Money – approximately $1,000

Time Saved – CMM data with aircraft maintenance data
Cost of NOT having the meta data stored with the instructions?
Modules

Converting Existing Maintenance Tasks into 1000D Documents

- **PEOPLE PERSPECTIVE**
- **PROCESS PERSPECTIVE**
- **COST PERSPECTIVE**

- **STEEP LEARNING CURVE**
- **MODIFY TEMPLATES SOFTWARE? VALIDATION PROCESS? DOCUMENT APPROVAL?**
- **RELATIVELY INEXPENSIVE**
Thank you
for your attention!

Questions?