

# Technical and Managerial Challenges Using S1000D in Practice

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# Technical and Managerial Challenges Using S1000D in Practice

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Speaker Title: Technical Writer

Company: ALOFT AeroArchitects

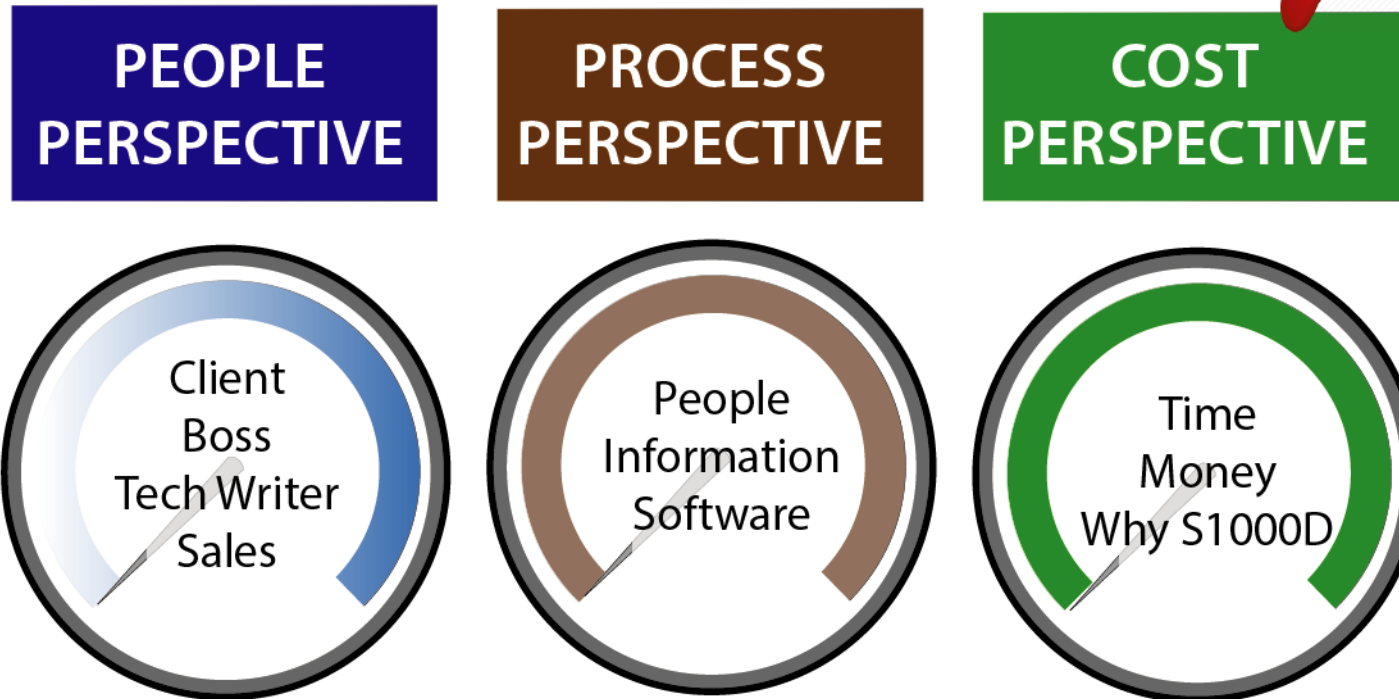
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# The Challenge

*Modules*

Converting Existing Maintenance Tasks into S1000D Documents



# 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

CLIENT



BOSS



ME



SALES



# People Perspective

## International specification for technical publications using a common source database

S1000D-B6865-01000-00  
Issue No. 4.2



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Publishers:



AeroSpace and Defence Industries Association of Europe



Aerospace Industries Association of America



ATA e-Business Program

Applicable to: All

S1000D-A-00-00-0000-00A-001A-A

DMC-S1000D-A-00-00-0000-00A-001A-A\_008-00\_EN-US

2016-12-31 Page 1



the adventure begins

# People Perspective

## S1000D CHAPT 1 – INTRODUCTION TO THE SPECIFICATION

...data is not duplicated....

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

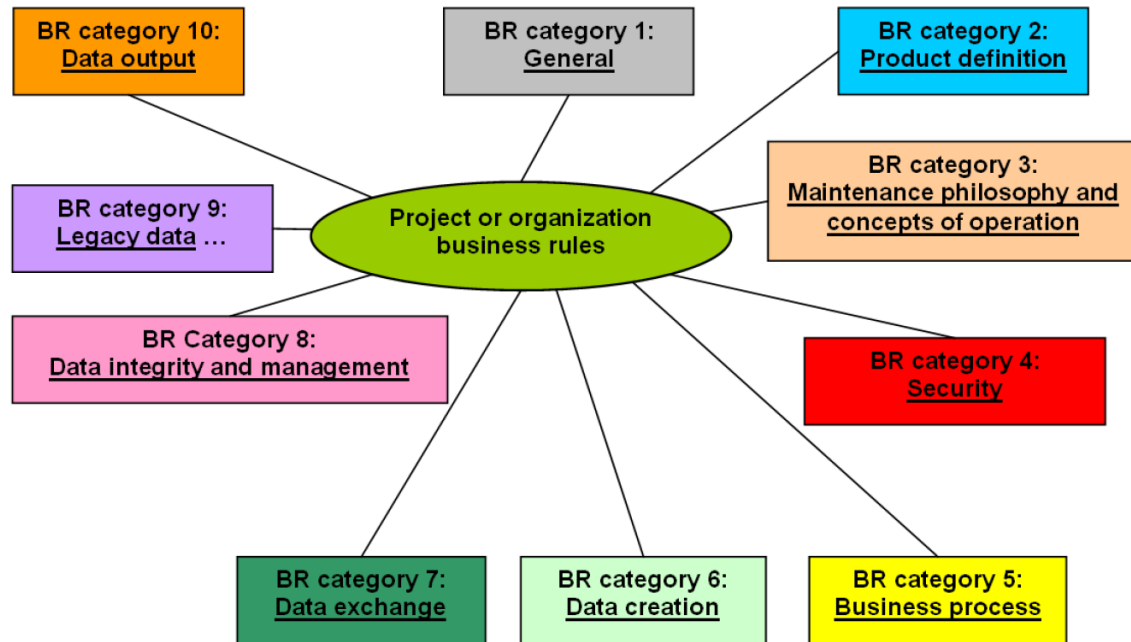


*“A tech writer’s dream comes true”*



# People Perspective

## S1000D CHAPT 2 – Documentation Process



ICN-83007-S1000D001-001-01

Fig 1 Business rule categories

85 Pages of Business Rules?  
10 Categories?



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# 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

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

Customize S1000D Business Rules to Meet Customer Requirements







# People Perspective

## Model Identity Codes

A319SN5261	Airbus A319, MSN 5261 Completion Project
A320	A320 Aircraft type
A321	A321 Aircraft type
A330	A330 Aircraft type
A330NEO	Airbus A330neo Aircraft
A330NEOIPD	Airbus A330neo IPD
A3502C03FRM	A350 2C03 MONUMENT
A3502C03SEAT	A350 2C03 SEAT
A3502C03SHELL	A350 2C03 SHELL



Just Ask



# People Perspective

S1000D CHAPT 3 – “Same as iSpec 2200”

**ATA Specification 2200  
(iSpec 2200)**

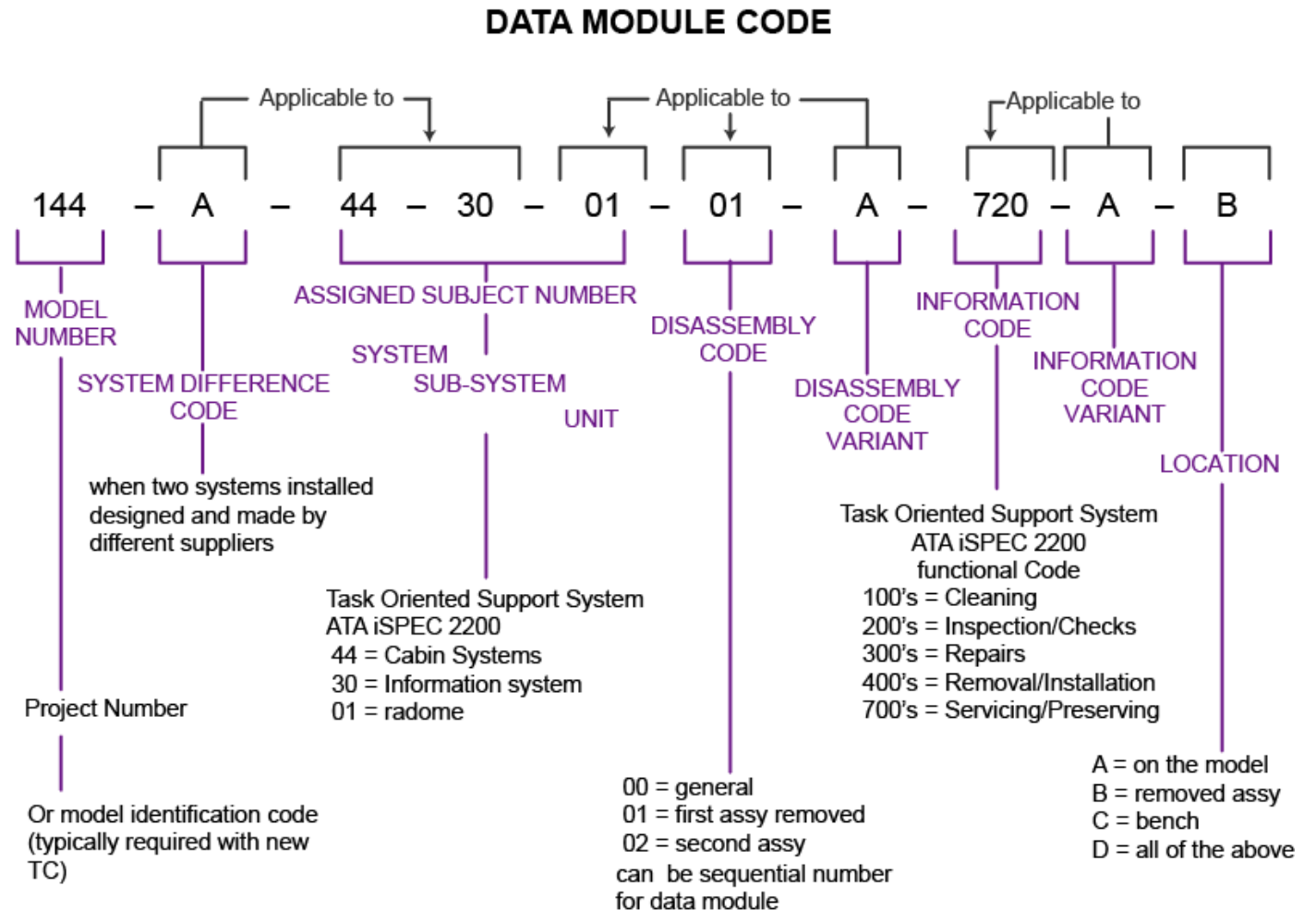
**Information Standards for  
Aviation Maintenance**

nothing new....



# People Perspective

Communicate  
Differences  
AMMS Tasks  
Vs  
S1000D Modules



# People Perspective

## Steep Learning Curve

S1000D REQUIRES INFORMATION "UNDER THE HOOD"

```
<AMM>
TITLE
SECTION
CHAPTER
ILLUSTRATIONS
```

Document Type Definition (DTD) defines the structure

```
<!-- =====
<!-- AMM TOP LEVEL STRUCTURE
<!-- =====
<!ELEMENT amm -- ((title, legalIntc?, mfr | increv | tr+) + (revst|revend|cocst|cocend)
<|ATTLIST amm
spl CDATA
model CDATA
oidate NUMBER
revdate NUMBER
tsn CDATA
cus CDATA
cusname CDATA
docnbr CDATA
lang CDATA
chg [N|R|U]
```

Answer: Schedule Time to Build Templates

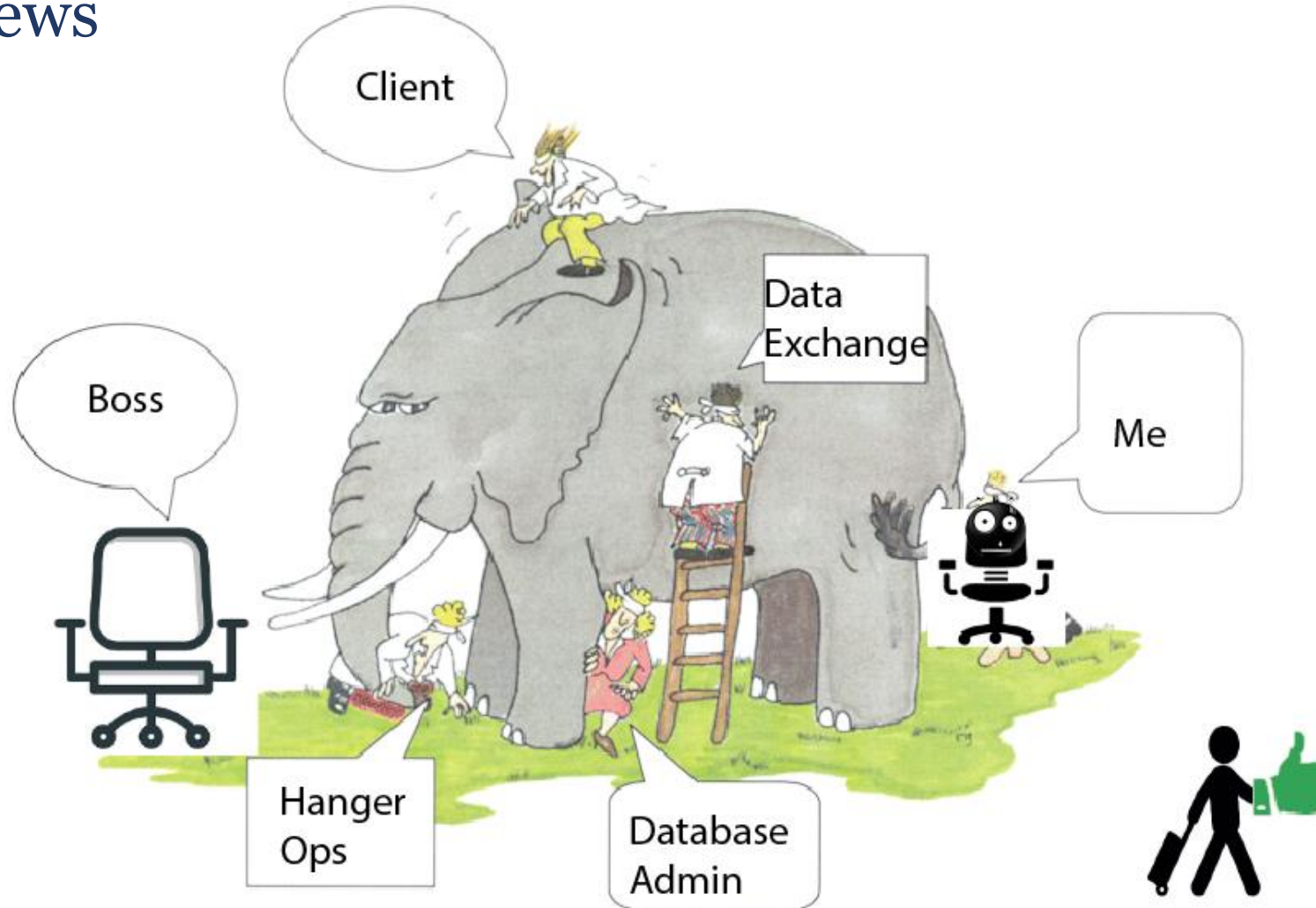


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# People Perspective

## Different Views



# Process Perspective

What processes change as a result of delivering .XML documents instead of .PDF?

# Process Perspective

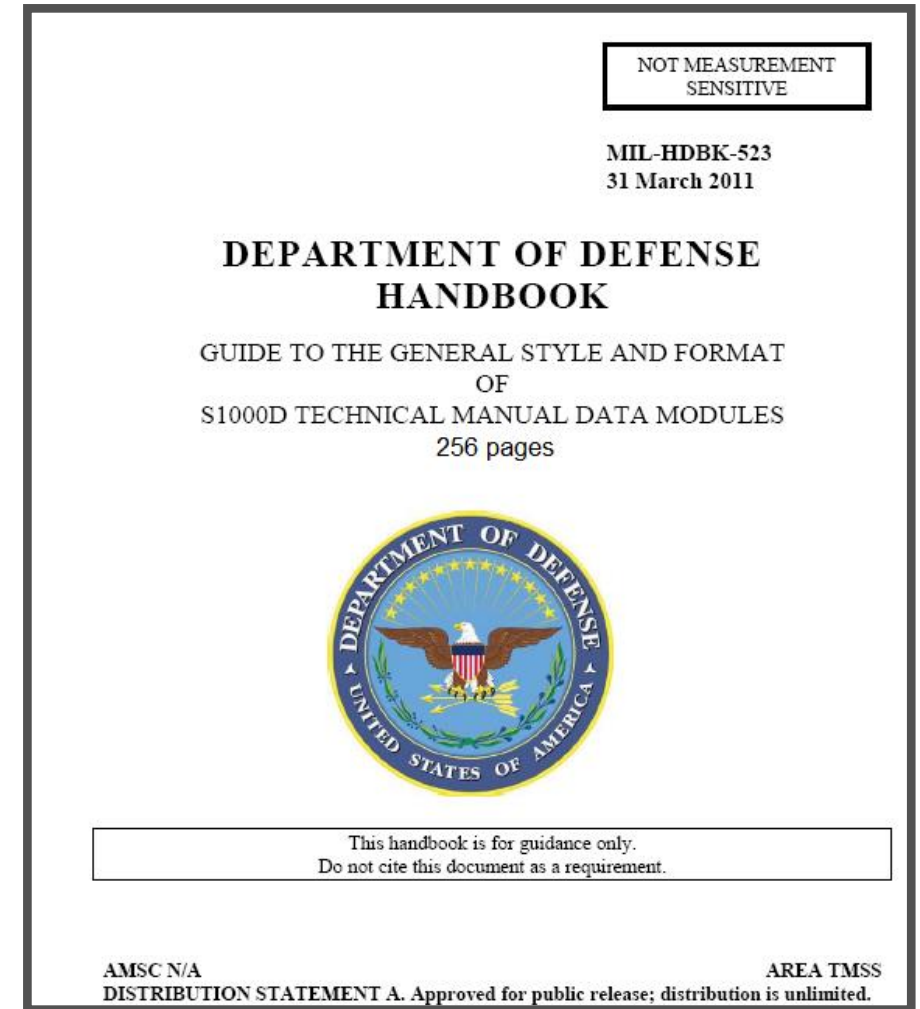
S1000D is not “Process Driven”

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





# Process Perspective

Previous Process used MicroSoft Word to create documents

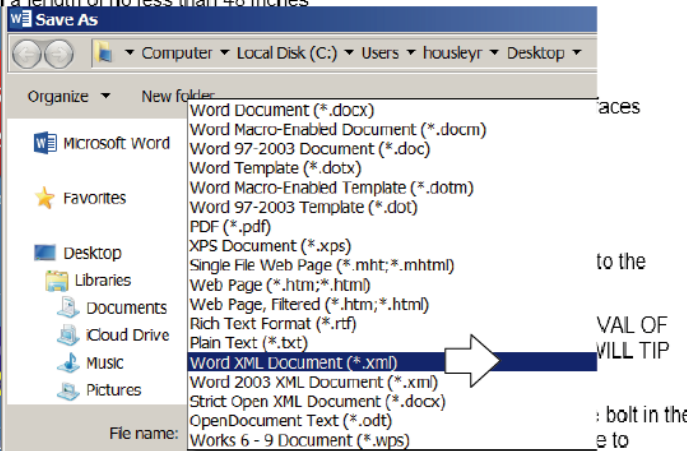
“why can’t you just “Save As .. Word XML”



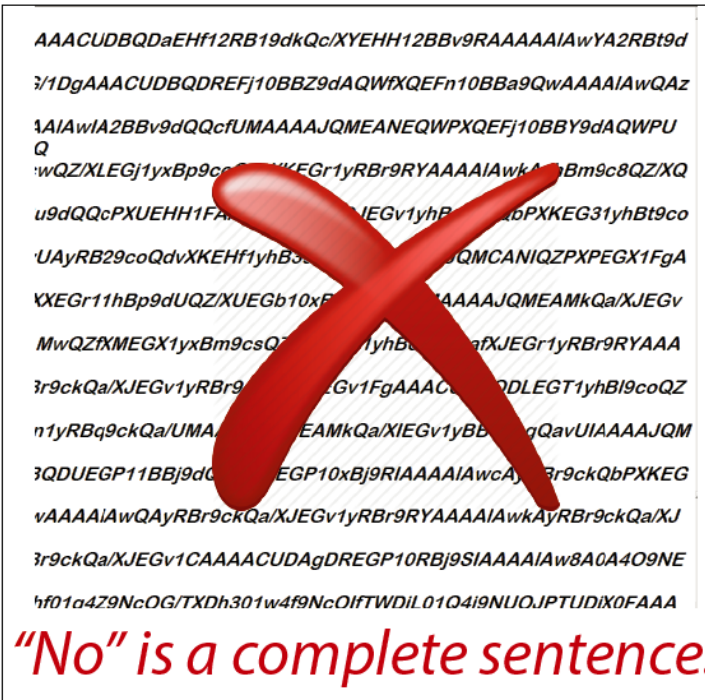
needed to use Lifting Sling assembly 1273972 (or 1245191) parts and procedure  
 or place the antenna into position.  
 Lifting assembly 1273972 (or 1245191) is not available, engineering can approve the  
 use of straps and hooks with the following characteristics:  
 with a working load greater than 2,000 lbs.

- Straps with a length of no less than 48 inches
- Hooks with a working load greater than 2,000 lbs.
- Hooks with a throat diameter of no less than 1/2 inch
- Hardware with a working load greater than 2,000 lbs.

- (1) Install protective cover
- (2) Disconnect wiring harness
- (3) Remove wiring harness
- (4) Attach lifting sling and antenna are tight
- (5) Remove the 8 hex bolts in the 5 o'clock position (aft-left)
- (6) Using the lifting sling, attached to the two outer lifting lugs, carefully lift/remove antenna off of the adapter plate.
- (7) Remove antenna tipping support as necessary.



WORD is dirty



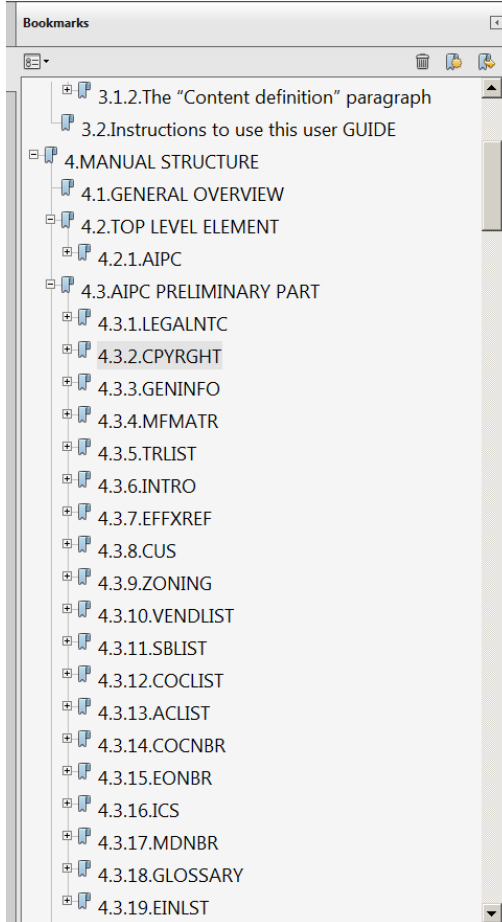
**CAUTION:** PROVIDE FINAL AWAY

**NOTE:**

Rotate antenna positioner clockwise (from above) to access bolts, as required. Elevation axis must be pivoted up to prevent interference between protective cover and the adapter plate. Do not push or pull on cable harnesses to rotate the antenna.

# Process Perspective

## Element and Attributes, Oh My



*A320 family, A330/A340 and A380 Aircraft Illustrated Parts Catalog*

### 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="U" 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>
```

Just ask....



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# Process Perspective

## Software Available:

### XML authoring tools

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

We Chose:  
FrameMaker



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# Process Perspective

## Script Errors


 Housley, Rhonda |  'TCS Support' | 1 | 1/30/20  
**FrameMaker** 2017 S1000D Script Error Fatal Error for file IPCS.fm

 Message |  IPCS.fm (128 KB)

Ajit,

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?

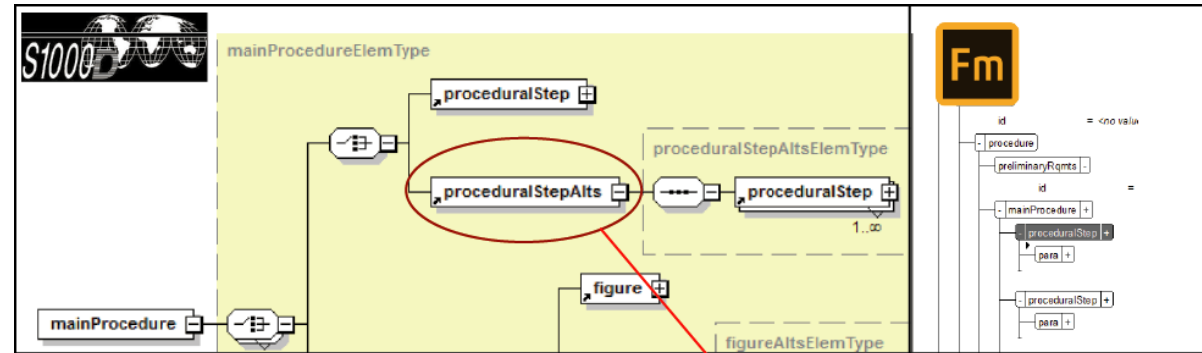
Thank you very much,  
Rhonda



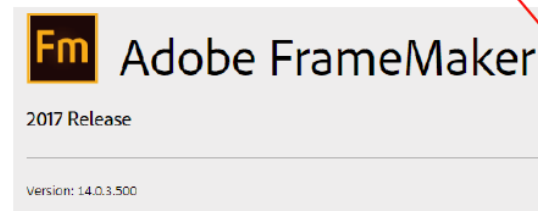
- 1.) Script Error :  
 Error Message : XML error in line 9  
 Script, Line# : C:\Program Files (x86)\Adobe\Adobe **FrameMaker** 2017\startup\s1000dMenu.jsxbin, 153  
 (this particular error has been reported previously. Was there something that I was supposed to do to prevent it? or fix it?)
- 2.) Fatal Error at file C:\Users\housleyr\Desktop\1264730\_003\_XML\IPCS\IPCS.fm.D13, line 9, char 17, Message: Attribute "xmlns:xlink" was already specified for element "pm".

# Process Perspective

S1000D  
Requirements  
Vs  
Out-Of-The-Box  
FrameMaker

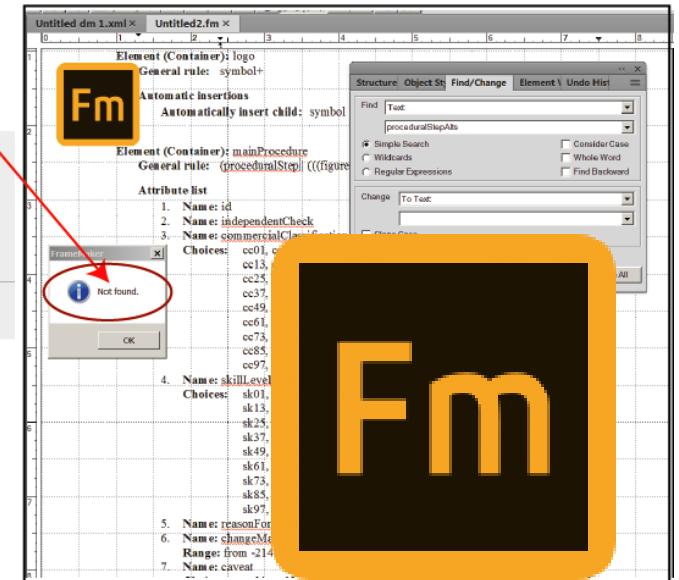


NOT ALL S1000D ELEMENTS ARE AVAILABLE IN FM  
example proceduralStepAIts



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!*



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# Process Perspective



SharePoint

BROWSE PAGE PUBLISH

Document Review P196 Doc Drafts EDIT LINKS

## About Tech Pubs

- Home
- About Tech Pubs
- WHAT WE DO**
- WHO WE ARE
- HELPFUL RESOURCES
- REGULATIONS
- Glossary
- TECH PUBS CALENDAR
- Wiki FANS
- AUXILIARY FUEL SYSTEM MANUALS
- SUKHOI
- MAX-8
- MAX-9
- INTERIOR MANUALS
- OTHER PROJECTS
- P196 Doc Drafts

# AVIATION TECHNICAL MANUALS

## IT'S WHAT WE DO

<p><b>Aircraft Maintenance Manual Supplements</b></p> <p><i>ICAW</i> Instructions for Continued Airworthiness</p> <p><i>ACPL</i> Aircraft Commercial Parts List</p> <p><i>AMMS</i> Aircraft Maintenance Manual Supplements</p> <p><i>MPDS</i> Maintenance Planning Data Supplements</p> <p><i>FIM</i> Fault Isolation Manual</p> <p><i>IPCS</i> Illustrated Parts Catalog Supplements</p> <p><i>SDS</i> Schematic Diagram Manual Supplement</p>	<p><b>Customized Manual Sets</b></p> <p><i>AFMS</i> Airplane Flight Manual Supplements</p> <p><i>AOMS</i> Airplane Operations Manual Supplements</p> <p><i>CC</i> Crew Task Cards</p> <p><i>COMS</i> Cabin Operations Manual Supplements</p> <p><i>CLG</i> Component Locator Guide</p> <p><i>FAMS</i> Flight Attendant Manual Supplements</p> <p><i>PBC</i> Passenger Briefing Cards</p>	<p><b>Service</b></p> <p><i>SB</i> S</p> <p><i>SL</i> S</p> <p><b>Docun</b></p> <p>Periodic</p> <p>Annual I</p> <p>Tempor.</p> <p>Technic</p>
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Customer Project  
 Program Management,  
 Sharing Information  
 Communications  
 Issues Tracking  
 Status Reporting  
 Evolve, Reuse

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# 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  
 “A Guide for Technical Publications Project Managers”

Pg 61

Here are some general statistics from that project:

Approximate equipment and software costs:	\$250,000
Project Duration	3 years
Number of data modules produced:	~ 3,000
Number of illustrations produced:	~ 6,000
Number of full time persons:	~ 4 full time persons for project duration

# Cost Perspective

## “FrameMaker”



- ✓ 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.<sup>†</sup>

To upgrade from two versions back to FrameMaker (2017 release): US \$599.<sup>†</sup>

†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



STEEP LEARNING CURVE

PROCESS PERSPECTIVE



MODIFY TEMPLATES  
SOFTWARE?  
VALIDATION PROCESS?  
DOCUMENT APPROVAL?

COST PERSPECTIVE



RELATIVELY INEXPENSIVE

**Thank you**  
for your attention!

**Questions?**