



Host (on behalf of ASD):



ADS is the Premier Trade Organisation for companies in the UK Aerospace, Defence, Security and Space Sectors.

Multi-Spec Management

Name of presenter: Jeff Stevenson
Rank/title of presenter: Vice President Pre-Sales
Company/organization: GPSL

S1000D User Forum, London

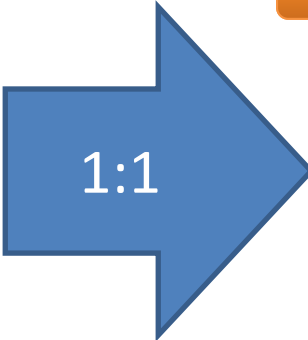
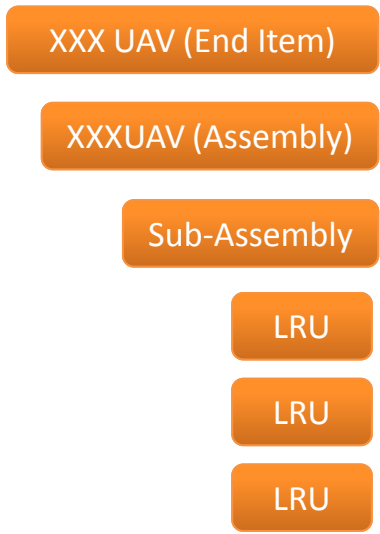
October 14-16, 2019

The Problem: Managing Legacy Content on New or Upgraded Products

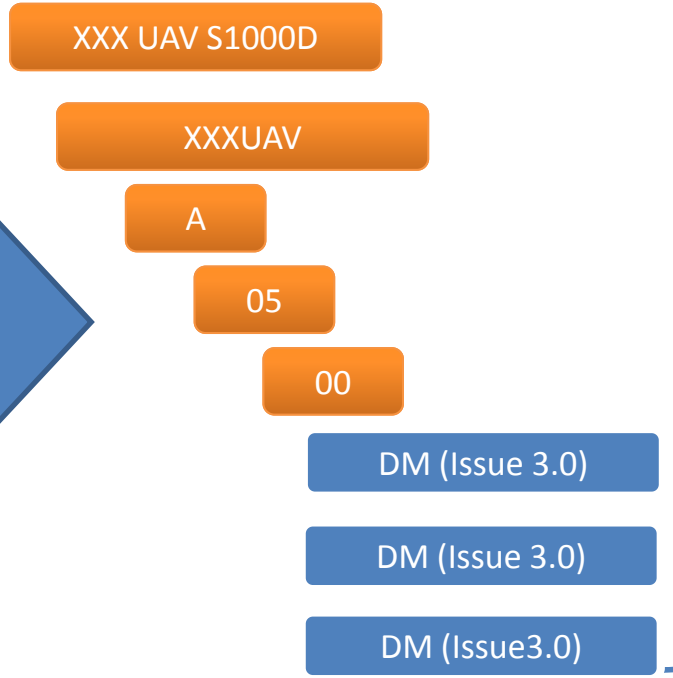
- Parts Structures are re-used across equipment deliverables
- Early issues of S1000D are being specified alongside new issues
- Old and new systems are supported with MIL-STDs too
- Commercial, structured information is in the mix too
- No matter the standard, all the technical content is valuable to ensure systems are available and mission ready
- **How do OEMs and other equipment manufacturers support multiple specifications (Multi-Spec) deliverables for the same equipment?**

Chapter 1: Ideal World: 1 to 1 Products and Docs

UAV-A Product Structure



S1000D SNS



Delivery

- Page Based PDF
- IETM
- TDP

Chapter1: Ideal World: 1 to 1 Products and Docs

Product A Part Structure

XXX UAV (End Item)

XXXUAV (Assembly)

Sub-Assembly

LRU

LRU

LRU

Product B Part Structure

XXX UAV (End Item)

XXXUAV (Assembly)

Sub-Assembly

LRU

LRU

LRU

S1000D SNS

XXX UAV S1000D

XXXUAV

A

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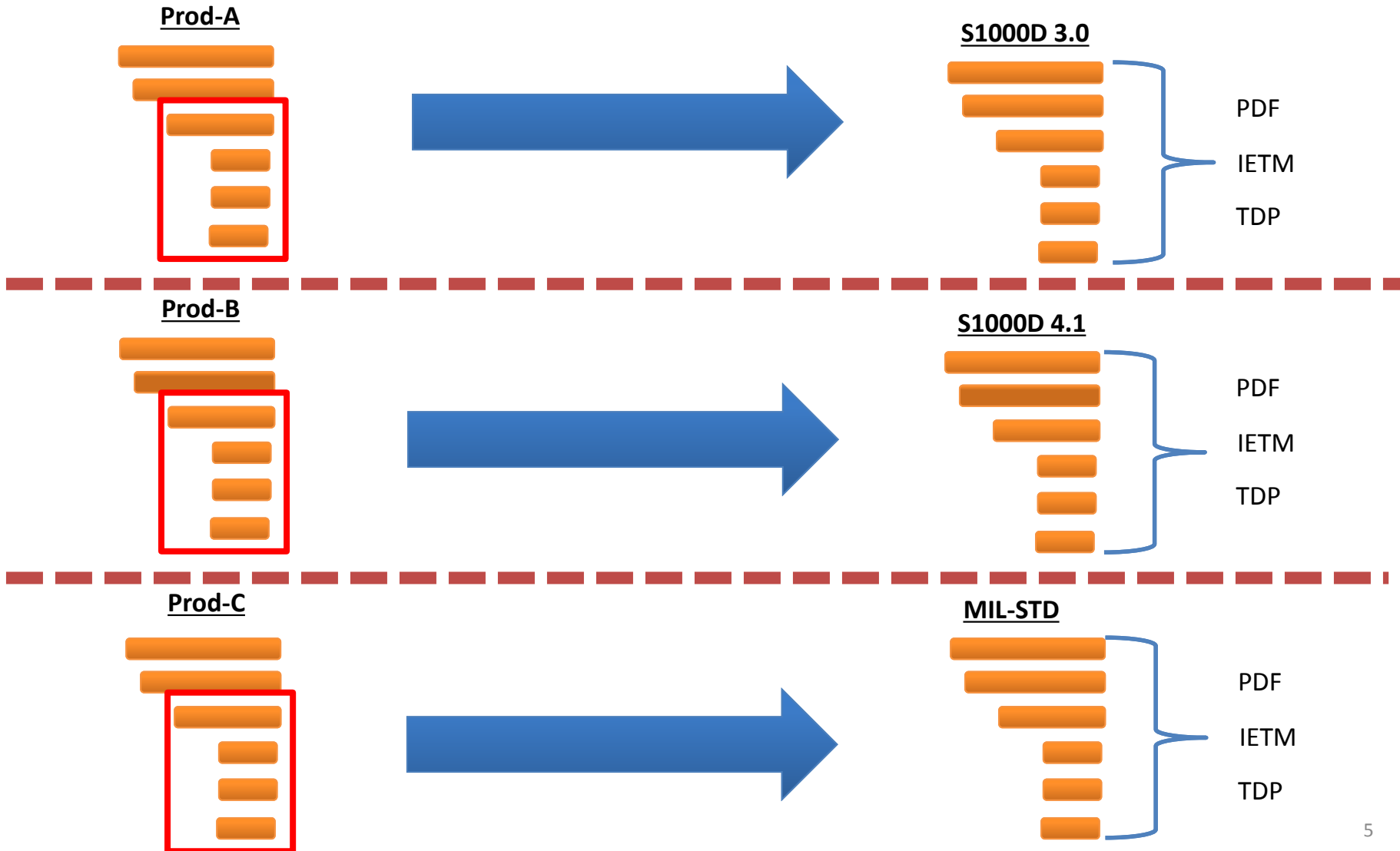
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Chapter 2: Reality –Documentation Silos



Chapter 2: Documentation Silos

- New programs specify new equipment, but existing Parts could satisfy
- Parts, Assemblies, Sub-assemblies may be re-used across programs,
- **BUT** New programs include unique contract deliverables for documentation causing:
 - Re-authoring documentation per program
 - Documentation may or may not be associated to the upstream parts
 - **Rinse and Repeat!**

Chapter 2: Effects of Documentation Silos

- Increased logistics costs
- Duplication of documentation (and possibly parts)
- Inaccurate maintenance procedures
- Complicated MTA processes
- Complicated planned service processes
- Less than optimal quality control
- Potential safety issues
- Inadequate training
- **How do OEMs and other equipment manufacturers support multiple specifications (Multi-Spec) deliverables for the same equipment?!**

The Story We Know (or Should!)

Structured Delivery

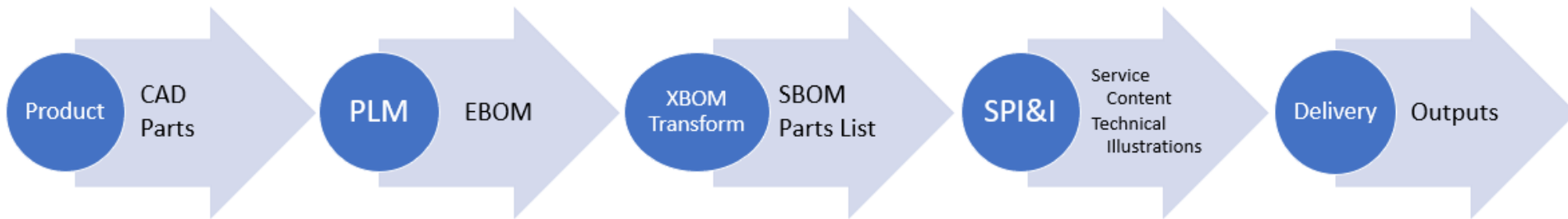
S1000D

MIL-STD

PDF

Word

New Chapter to the Story: Digital Thread



- Starts with engineering drawings
- Establishes associativity with parts via EBOM to SBOM
- Allows illustrations created from drawings
- Connects content to parts in LBOM/SBOM

Structuring Multi Spec content for Workflows

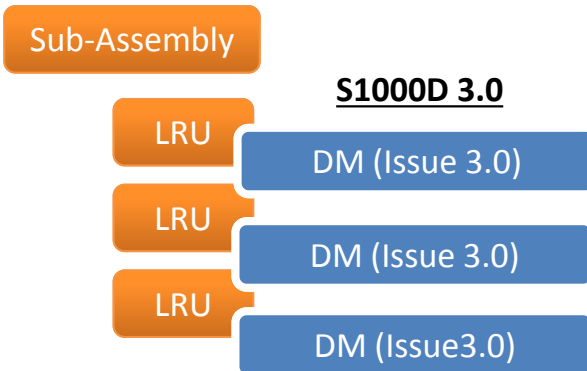
- A **product-centric** information structure like an S1000D SNS (System, Sub System, Sub, sub system, Unit or assembly) provides a framework for organizing :
 - Source Content from multiple specifications
 - Parts Lists
 - Support Documents
 - Graphics
 - Multimedia

Attributes of a Multi Spec Environment

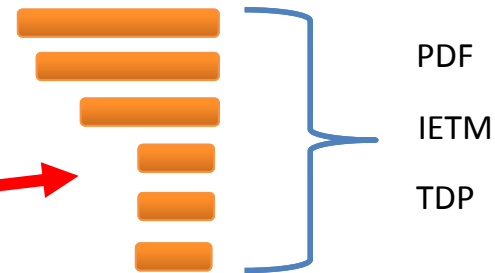
- A **product-centric** approach to organizing and creating documentation **promotes content re-use** by allowing content to flow along with the re-used of parts, assemblies, and sub-assemblies.
- The approach uses a **Publication BOM** to organize content from various specifications into a single publication for delivery.
- Normalizing the multiple specifications into 1 delivery is done through intelligent publishing processes using
 - Content Pipelines
 - Intelligent Stylesheets
- It is a **publishing solution** to a content management problem.

Product-Centric Approach

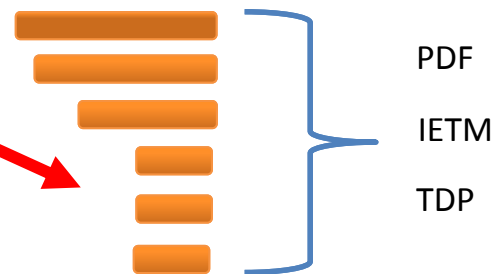
Product Sub-Assembly



Product Program A

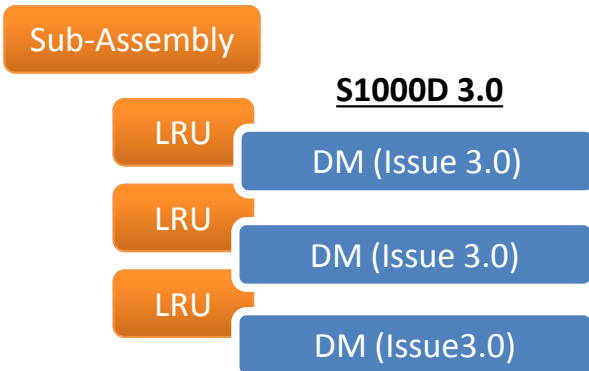


Product Program B

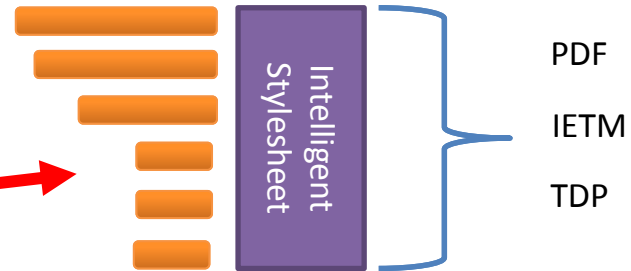


Publication Bills of Materials & Intelligent Stylesheets

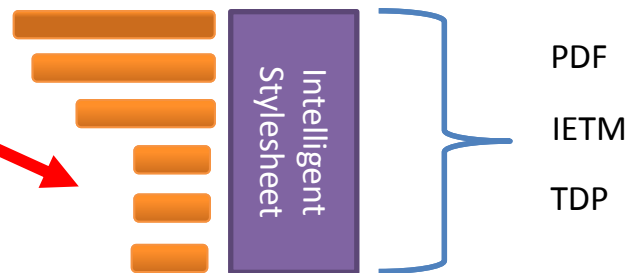
Product Sub-Assembly



Product A Publication BOM

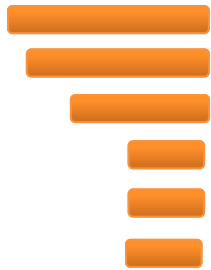


Product B Publication BOM

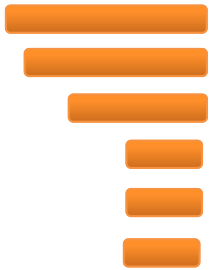


Publication BOMs

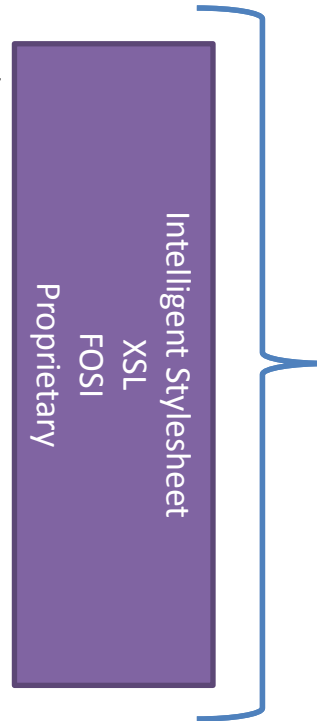
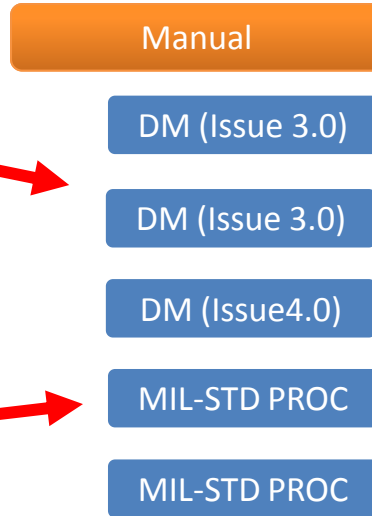
Program A



Program B



Program C Publication BOM



Delivery

- Page Based PDF
- IETM
- TDP

Components of the Multi Spec Workflow

Pipeline Process

- Apache ANT
- Java

Publication BOMs

- Data Modules
- Other Publication Modules
- Legacy technical

Transformations

- XSLT (eXtensible Stylesheet Language Transformations)
- SAX (Simple API for XML)
- Custom Scripts

Stylesheets

- XSL
- FOSI
- Proprietary

Publishing BOM: Combining Multiple Standards

Products > PTC MPV S1000D: 2AAV4 > Publication Structures

S1000D 4.1 Publication Structure - 40A4657C, PMC-MPV-0K0D7-MM001-00, 2AAV4, 0,2.1 (Service) Draft

Details | Structure | Representations | Changes

Editing: Insert Existing, Insert Now, Remove, Edit, Move
 Check Out/In: Check Out, Check In, Undo Checkout, Checkouts
 Clipboard: Paste, Copy
 Viewing: Views, Display
 New/Add To: New, Add to
 Filter: Edit Filter, Current Filter, Saved Filters
 Publish: Representation
 Tools: Open In
 Reports: Reports

Find in Structure

Name	CI	View	Version	State
Wiring		Service	A.3 (Service)	In Work
Disassembly		Service	A.4 (Service)	In Work
Road wheel hub assembly - General (task)		Service	A.1 (Service)	Released
Suspension unit - Rear Axle (task)		Service	A.1 (Service)	Released
DMC-MPV-A-83-10-00-00A-520A-D		Service	1.0.1 (Service)	Issued
DMC-MPV-A-83-10-05-00A-520A-D		Service	1.0.1 (Service)	Issued
DMC-MPV-A-83-20-00-000-520A-D		Service	1.0.1 (Service)	Issued
DMC-MPV-B-C2-01-01-010-520A-D		Service	1.0.1 (Service)	Issued
DMC-MPV-A-C2-00-02-01A-520A-D		Service	1.0.2 (Service)	Issued
DMC-MPV-A-C2-03-01-0000-530A-D		Service	4.0.1 (Service)	Issued
Assembly		Service	A.4 (Service)	In Work
IPD		Service	A.5 (Service)	In Work

(20 objects)

PTC MPV S1000D | Information Element List | Attributes

Publication Section Attributes

Name: Disassembly
Number: 0000030274
Version: A.4 (Service)
State: In Work - Released - Canceled
Status: Working copy, checked-out to you
Modified By: Administrator, Windchill
Last Modified: 2018-03-29 08:23 EDT
Service Description:
Apply title from content: No
Exclude content from No

Summary: Advantages Product-Centric Documentation

- Ability to reference common illustrations
- Ability to reference common text fragments such as Warnings and Cautions
- Support various commercial and military programs from one system utilizing common processes for technical data
- Cost savings from concentrating on developing reusable workflows and trainable processes
- Promoting re-use of readily available designs and associated content
- Decreased logistics costs
- More accurate MTA and planned service processes
- Reduced errors in procedures
- Promotes safety of crews in the field

Thank you

for your attention!

Questions?



GPSL

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