

SDL



**Your Content
Their Language**

Introduction to S1000D Concepts

S1000D Webinar Series, Session 1

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Our Presenters Today



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S1000D and IETM Specialist
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XML Evangelist
SDL XySoft

- **Provide an understanding of the purpose and history of the S1000D specification**
- **Introduce the core concepts of S1000D**
 - Modular nature of the data
 - S1000D mechanisms for content creation, classification, interchange, document assembly, publishing, and electronic delivery
- **Discuss the challenges of adopting S1000D**
- **Explain why a CSDB (Common Source Data Base) is needed to effectively manage S1000D content**
- **Identify the factors that contribute to a return on investment in the adoption of S1000D**

- **S1000D History and Adoption**
- **The Modular Nature of S1000D Content**
- **S1000D Alphabet Soup**
- **S1000D Challenges**
- **Why a CSDB?**
- **Making the Business Case for S1000D**
- **Brief Overview of Webinars 2-5 in this Series**

● What is S1000D?

- An international specification for the *procurement* and *production* of technical publications
 - *Procurement: Contracts may require technical publications be delivered per a particular “Issue” of S1000D (new issues don’t supersede)*
 - *Production: S1000D defines how technical information is managed, interchanged, and published using XML and various graphic and multimedia formats in a Common Source Data Base (CSDB)*

● Why was S1000D developed?

- In the 1980s, documentation for military projects in Europe used various national specifications, making data interchange between nations difficult
- During this same period, civil aviation was successfully using ATA S100 to deliver and interchange information internationally
- To ease interchange between nations, the AeroSpace and Defence Industries Association of Europe (ASD) (formerly AECMA) developed the S1000D specification; derived from ATA S100, it was widely adopted in Europe by military projects

● Why has S1000D continued to evolve?

- Documentation for military projects in the various U.S. joint services were also written to various standards, making interchange difficult and often requiring each service to support multiple military specifications
- Documentation for military variants of commercial aircraft had to be converted into various mil-specs from civil aviation standards

● How has S1000D continued to evolve?

- Today, S1000D is co-managed by ASD, AIA (Aerospace Industries Association of America), and ATA (Air Transport Association)
- The specification now addresses not only air, but also land and sea applications
- Adoption by U.S. Military
 - *USSMG/IG (United States S1000D Management & Implementation Groups)*
- Adoption by Civil Aviation
 - *ATA CAWG (Air Transport Association Civil Aviation Working Group)*
 - *Boeing (B787); Airbus (A350); Engine and component manufacturers*

● S1000D.org public website

- <http://public.s1000d.org>
- The specification in PDF format and schemas for all S1000D Issues are available at no charge

● United States S1000D Management Group (USSMG)

- <https://ussmg.btas.com>
- If you want to help manage the S1000D from a U.S. military perspective

● United States S1000D Implementation Group (USSIG)

- <https://ussmg.btas.com/ussig>
- If you want to work on technical committees committed to improving the specification

● Air Transport Assn. Civil Aviation Working Group (CAWG)

- <http://www.ataebiz.org> for more information
- Join the ATA to participate in managing S1000D from a civil aviation perspective

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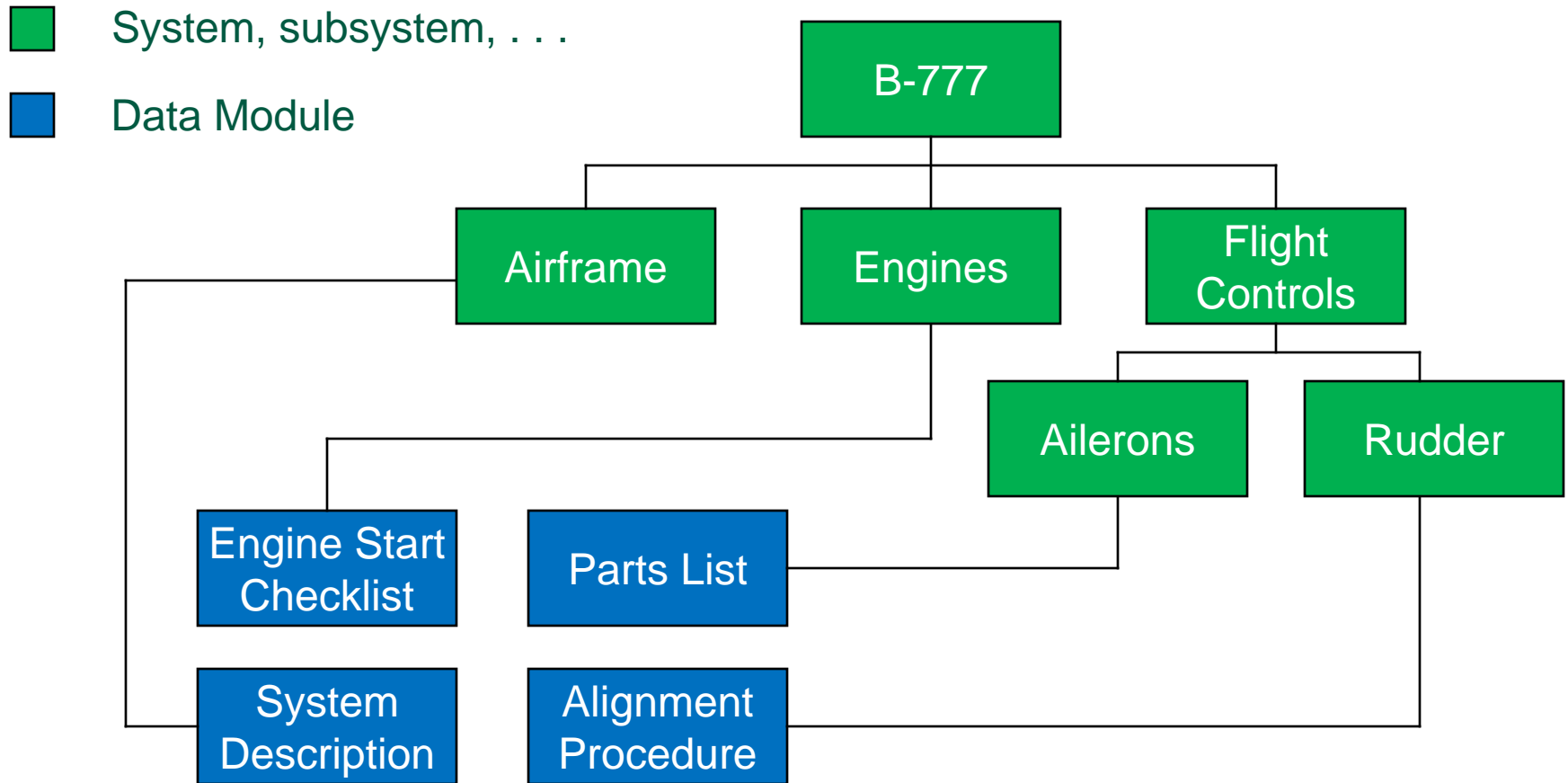
● Why is it modular?

- Fundamentally about reuse
- Makes content reusable across product documentation
- Facilitates reuse across output formats

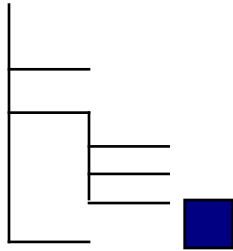
● How is it modular?

- Each unit of content or data module (DM) has a unique data module code (DMC) that conveys:
 - *to what component it applies*
 - *the type of information it provides*
- Output is controlled by a publication module (PM) that organizes data modules
- Same DM can be referenced by any number of PMs

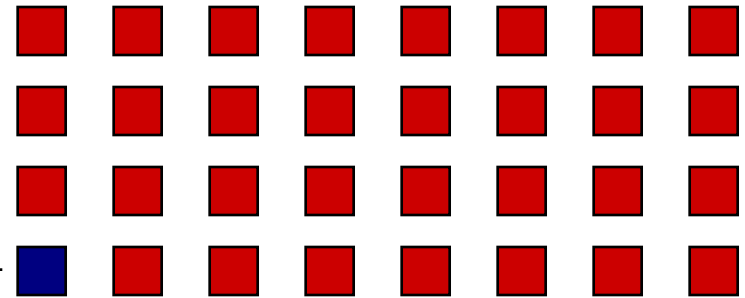
Applying Content to Component



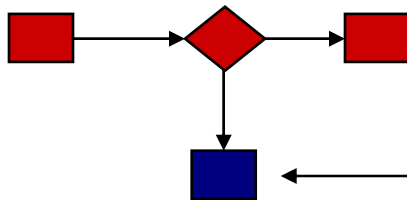
Publication Module for
Repair Manual (Print/PDF)




Data Modules

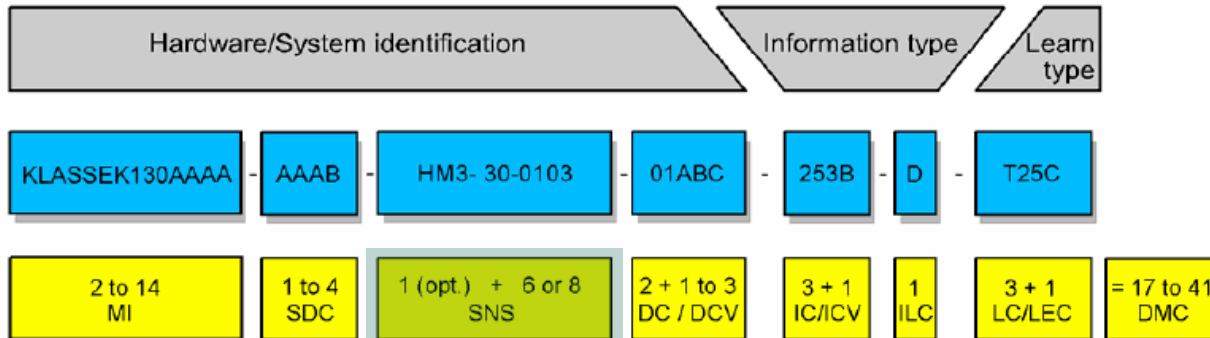


Publication Module for
Interactive Electronic Product



 = Cockpit radio remove
& replace procedure
reused for multiple
products

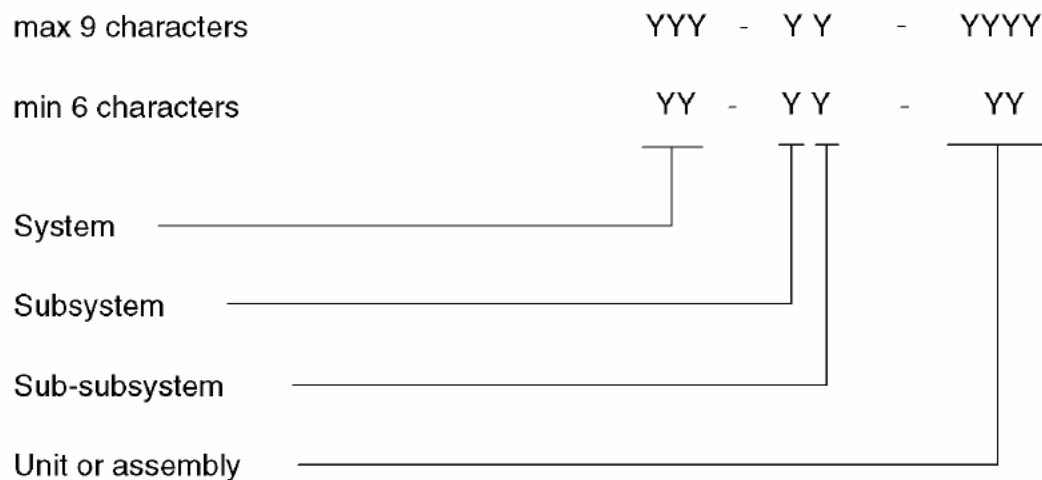
It's All in the Codes*



MI	Model Identification	As assigned by NATO Maintenance and Supply Agency
SDC	System Difference Code	Essentially, variant
SNS	Standard Numbering System	Map to specific component
DC/DCV	Disassembly code and variant	Tied to breakdown
IC/ICV	Information code and variant	e.g., description of function
ILC	Item location code	e.g., on ship versus on shore
LC/LEC	Learn code/learn event code	e.g., demonstration/lesson plan

* Top image from S1000D Issue 4.0, 2008-08-01

- **SNS reflects the system/component hierarchy of the product being documented**
- **S1000D spec maintains the SNS for land, air, and sea systems, and provides examples for other systems**
- **Each project must tailor SNS for their unique requirements**



Aircraft example:
72-20-00 = power
section of a
reciprocating engine

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● **CSDB - Common Source Data Base**

- A content management system customized for S1000D

● **DM – dmodule - Data Module**

- A discrete piece of information stored in a CSDB
- There are a number of data module **types**, to provide appropriate structures for different types of content:

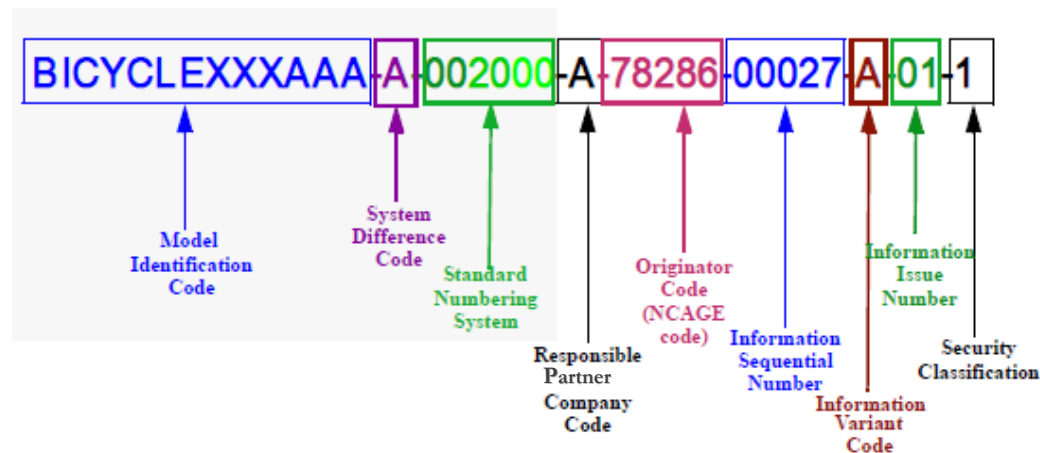
- *Descriptive*
- *Illustrated Parts Data*
- *Wiring Data*
- *Crew/Operator*
- *Business Rules Exchange*
- *Checklist*
- *Etc.*
- *Procedural*
- *Fault isolation*
- *Maintenance Scheduling*
- *Technical Information Repository*
- *Container*
- *Learning*

- **All data modules have the same high-level structure, comprised of two sections:**
 - **idstatus** - **identAndStatusSection** – Identification and Status Section
 - *Contains identification metadata such as **DMC** (Data Module Code), title, issue number, issue date, language, security classification, QA status, reason for update, **applicability**, and more*
 - **content** – Content Section
 - *Contains the text and illustrations that are presented to the information user*
- **DMRL- Data Module Requirements List**
 - An XML file containing a list of all the data modules needed to support a product; can be generated in parts by partner companies or in complete form. Example snippet of a DMRL reference to a data module:

```
...modelIdentCode="S1000DBIKE" systemDiffCode="AAA" systemCode="DA2"  
  subSystemCode="2" subSubSystemCode="0" assyCode="00" disassyCode="00"  
  disassyCodeVariant="AA" infoCode="520" infoCodeVariant="A"  
  itemLocationCode="A" /> <issueInfo issueNumber="002" inWork="00"/>  
</dmRefIdent> <dmRefAddressItems> <dmTitle> <techName>Handlebar</techName>  
<infoName>Remove procedures</infoName>...
```

● ICN - Information Control Number

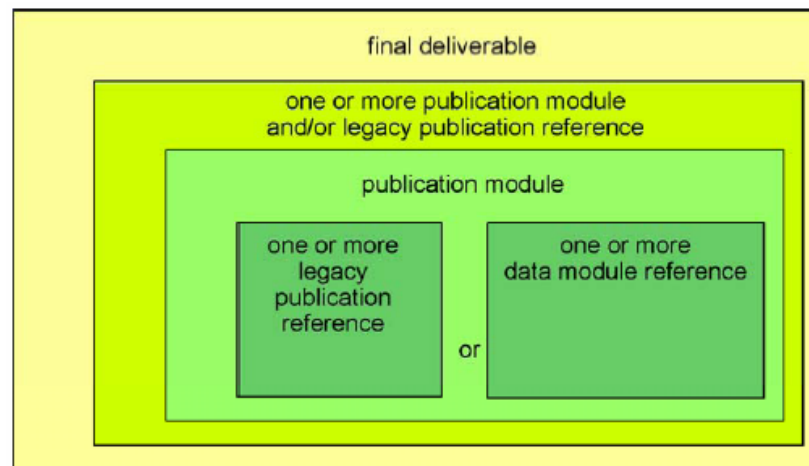
- Similar to a DMC, the ICN is used to uniquely identify Illustrations and multimedia



ModelIC, **SDC**, and **SNS**, are identical to the codes used for the DMC

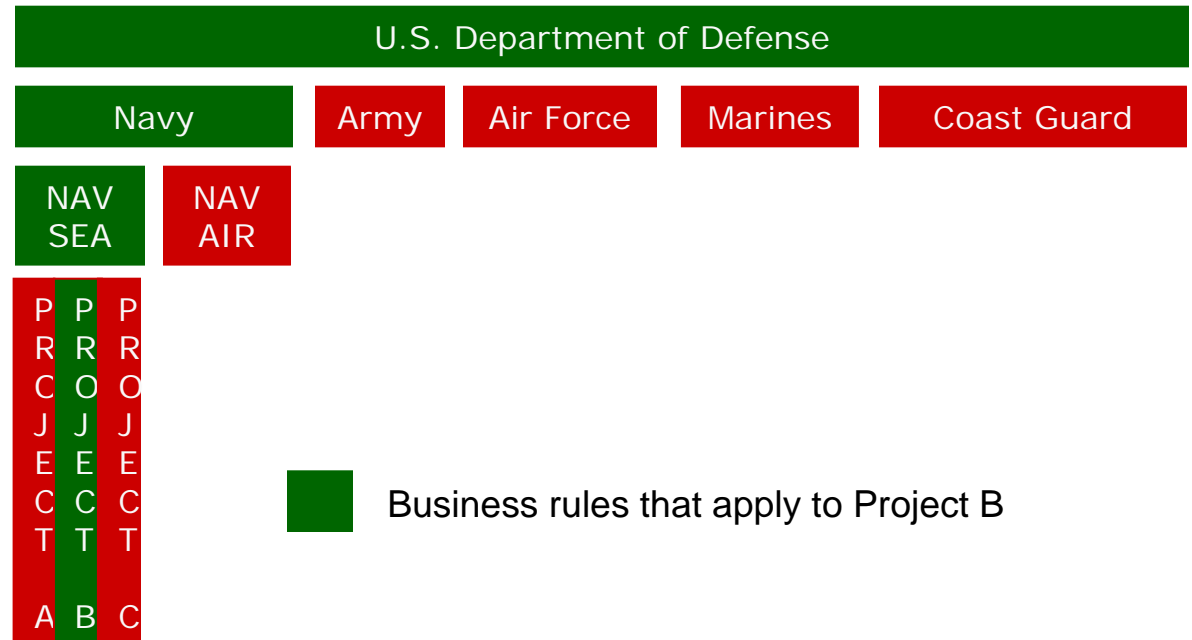
● PM - Publication Module

- A “virtual document” description of how data modules combine to form a publication. Similar to a data module in that it has:
 - *An identifier or **PMC** (Publication Module Code)*
 - *A status section*
 - *A content section*
- The content section contains references to data modules, other publication modules, or legacy technical publications in the order and structure in which the document will be delivered
- Publication modules can be nested



● BREX – Business Rules EXchange

- A means to communicate the business rules that have been developed and agreed upon within a project
- May describe elements and attributes that must/must not be applied to CSDB objects and definitions of allowed/disallowed values for elements and attributes
- Business rules can be layered:



● **DDN – Data Dispatch Note**

- An XML file that serves as a manifest for a data transfer package which may contain data modules, graphics, multimedia, publication modules, and/or DMRLs packaged for interchange
- The DDN defines the sender, receiver, and content of a data dispatch
- The DDN is identified by a CONTROLNUMBER in the format:

MI-SSSSS-RRRRR-YYYY-NNNNN

Model Identifier

Sender NCAGE

Receiver NCAGE

Year

Sequential nr. per year

● **IETP** – Interactive Electronic Technical Publication

- A highly-functional electronic publication that can be delivered on CD/DVD, over the Web or an intranet
- Technical data is used in a non-linear fashion
- Involves high levels of interactivity between the data and the user
- The sequence of presentation is dictated by inputs from the user, external sources or events (as in diagnostics)
- Can be integrated with M&E systems, parts inventory, or reasoning engines to provide additional functionality
- Allows the use of multimedia, including 3D models, animations, simulations, video & audio, digital photographs, and more
- The S1000D specification includes a “Functionality Matrix” that can be used during the procurement process to define contractually required IETP functionality for a given project

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- **Authoring in XML**
- **Project Planning**
- **Data Conversion**

- **Many S1000D adopters are coming from the unstructured world**
 - Especially true for OEMs and small writing shops who are now required to deliver in S1000D
 - Learning XML concepts and transitioning from WYSIWYG to markup will take time, and this should not be underestimated
- **Even for experienced XML practitioners, S1000D is a challenging specification**
 - Rich and complicated markup (~ 1,000 elements)
 - Typical publications contain hundreds if not thousands of references that need to be managed
 - Applicability alone is an exercise in logic that can hurt your head

- **It's no longer about working from a book outline**
- **What was once a set of manuals is now a collection of information units**
 - Need to support the required output
 - Must fit the intended reuse approach
- **The spec provides considerable flexibility via “project specific decisions,” also known as business rules**
 - Example: security attributes, authoring styles, illustration rules, use of simplified English
 - Projects must therefore make these decisions, and an information supplier supporting multiple projects must apply the right business rules to the right projects

- **Conversion may be from unstructured to S1000D or from some other markup (legacy SGML or XML)**
- **Unstructured conversion presents all the usual challenges associated with mining proprietary information**
- **Structured legacy conversion will be more than markup to markup transformation**
 - Subject matter experts must determine how to “chunk,” i.e. what constitutes a data module?
 - Each DM needs to be coded
 - Must also determine what data module type to use; if it looks like a procedure, is it a procedure, or is it a checklist or , . . . ?

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- The S1000D specification calls for it!

“

International specification
for
technical publications

utilizing
a common source database



”

Taken from the “S1000D international specification for technical publications”, Issue 3.0

● S1000D Information Set Management

- An information set defines the technical documentation to be produced and establishes a data module requirement list (DMRL)
- The DMRL defines which data modules (DMs) must appear in a given information set
- There are many types of information sets and many types of data modules; they all have different functions and different structures
- A Publication Module (PM) defines the way DMs are organized within a publication
- **More than 2,700 pages are required (Issue 4.0) to describe how S1000D is utilized**

● S1000D Data Module Code Management

- Each Data Module must have a Data Module Code which comprises up to 37 alphanumeric characters
- DMCs consist of two partitions:
 - *Hardware identification (model identification; system difference code/SDC; standard numbering system/SNS: system-subsystem-subsubsystem; disassembly code/DC; disassembly code variant/DCV)*
 - *Information type (information code/IC; information code variant/ICV; item location code/ILC)*

● S1000D Information Control Number Management

- Each illustration sheet, multimedia object or other attached data must have its own Information Control Number

ICN - YYYYYYYYYYYYYY - YYYY - YYYYYYYYYY - Y - YYYYY - .NNNNN - A - XX - X

● And the remaining 2,600 pages of the S1000D specification...

- All the “alphabet soup” concepts discussed previously must be accommodated in your tech pubs process:
 - *Data Dispatch Notes for interchange*
 - *DMRL management with the ability to create all the various data module types with the appropriate structure and metadata in the identAndStatusSection (idstatus)*
 - *The ability to produce a Publication using the Publication Module as a virtual document map that drives how data modules are assembled into publications*
 - *Multi-channel publishing requirements for paper/PDF and IETP*

Does all of this sound complicated?

IT IS!

But a good CSDB will automate and simplify the processes involved with producing S1000D content

Increased productivity and content reuse, and improvements to the consistency and accuracy of content are typical benefits provided by a CSDB

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- **Adoption will require an investment in skills and technology**
- **Although S1000D is often being mandated, risks involved with not performing a business case analysis include:**
 - Insufficient understanding for setting the right foundation
 - Inappropriate tools
 - Insufficient resources
 - Unrealistic expectations by management

● Reuse

- Generally one of the most significant drivers in XML adoption
- Particularly germane to S1000D due to its design
- If metrics are not in place today, start getting a handle on
 - *authoring costs*
 - *frequency of change*
 - *Impact on volume of work*

● Production cost

- It costs much more to hit the “print” button than people think
- Pagination issues and cost of recurring production eat up untold hours of people’s time, especially with redos
- Automated tools tailored to S1000D are widely available and getting better

● Translation

- Development trends suggest greater need to consider multilingual S1000D publications
- XML, and particularly S1000D, is well suited for automated translation
- ROI = adoption of consistent terminology, simplified English and other improved authoring techniques

● Quality

- Difficult to measure, but important consideration
- Update cycles are easier to manage via the CSDB

● Ultimately, the biggest driver

- Better readability (simplified English and less “meta-information”)
- Ease of matching data to system configuration via applicability
- Better fault isolation through more advanced structures such as process data module
- Potential for better information sharing (S1000D/SCORM initiative)

- **S1000D provides a rich and powerful framework for meeting your information needs**
- **Adoption requires careful planning and some investment in skills and technology**
 - Don't try to implement S1000D without a CSDB
 - Understand which Issues of S1000D you must support—remember that new Issues of the specification do not supersede
 - Be aware of *all* the S1000D Business Rules that apply to your projects
- **If you believe S1000D is in your future, getting educated now will avoid panic and headaches later**
 - S1000D Resources provided in this Webinar are a good place to start
 - You may also wish to get involved with subcommittees, such as “Sea Working Group”, “Air Working Group”, etc. through the USSMG
 - SDL XySoft's series of educational S1000D Webinars in 2010

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● **S1000D Workflow – January 2010**

- Discussion of the S1000D project lifecycle, from DMRL creation to publishing from a Publication Module

● **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.sdlexysoft.com

● Email

- Rhonda Wainwright: rwainwright@sdl.com
- Harvey Greenberg: hgreenberg@sdl.com

Join us for our next S1000D webinar...

● S1000D Content Workflow

● Thursday, January 21, 2010

● To register:

<http://www.sdlexysoft.com/en/news-and-events/events>

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