30 September 2009

Implementation Guide
For US Army use of S1000D

CONTENTS

1 Introduction

LOGSA acknowledges that programs embarking on an S1000D project are, to some degree, breaking new ground. Many of the concepts in S1000D should be familiar to a program office already familiar with Army technical data (XML, functionality matrix, content selection, all the content requirements, etc.), but many new concepts (data modules, information codes, business rules, etc.) exist as well. It is the purpose of this document to ease the transition from a legacy specification skill set to an S1000D skill set for acquisition professionals. This document is designed to bridge the gap and point out differences between traditional Army technical data acquisition and S1000D data acquisition. It should become apparent that the overall concept, objective, and many of the details are exactly the same. In most cases, references to existing (and unchanged) legacy policies are provided to maintain a sense of continuity and to reinforce that the process differences are minor.

2 References

The following documents are referenced in this document:

AMC PAM 25-32	—	Guide for Preparation of Equipment Publications Contract Packages
AR 25-30	—	The Army Publishing Program
AMC-R 25-76	—	The U.S. Army Materiel Command (AMC) Equipment Publications Program
AR 70-1	—	Army Acquisition Policy
AR 70-50	—	Designating and Naming Defense Military Aerospace Vehicles
DOD 5010.12-M	—	Procedures for the Acquisition and Management of Technical Data
MIL-STD-3031	—	Army Business Rules for S1000D: International Specification for Technical Publications Utilizing a Common Source Data Base
S1000D Basic Training	—	(S1000D training materials prepared by LOGSA)
S1000D Issue 4.0	—	International specification for technical publications utilizing a common source data base.

3 Checklist

Introduction

This checklist is a guide for acquisition professionals, program managers, and others who are embarking on an S1000D project.

This checklist includes the steps that will be followed in a typical S1000D project. It is not intended to apply to every situation or to supersede any Army or DOD policy. It is a supplementary job aid.

The items in this list are presented in the order in which the tasks will typically be accomplished. This order is not necessarily applicable to every project as some situations may dictate a different order or parallel undertaking of steps.

PRELIMINARY PLANNING

S1000D Education
- Become familiar with S1000D
- Become familiar with MIL-STD-3031
- Complete S1000D Basic Training

Identify representative(s) to attend S1000D and IETM community meetings

Identify and register model identification code(s) with North Atlantic Treaty Organization (NATO) Maintenance and Supply Agency (NAMSA)
- Document Model Identification structure
- Determine FSC sequence numbers

Create technical manual outline
- Identify publications to be produced
- Identify information sets
  - Coordinate with LOGSA concerning all required information sets not specified in MIL-STD-3031, Appendix B

Schedule the publication(s)

Create draft Data Module Requirements List (DMRL)

Identify functionality

Identify SNS

Determine if reusable data exists
- Are Commercial off-the-Shelf (COTS) manuals available?
- Do reusable data modules exist?
- Does reusable legacy data exist?
- Coordinate legacy data use BRs with LOGSA

Coordinate with TRADOC proponent school
- If learning content will be developed using S1000D, coordinate BRs with LOGSA

Prepare MOUs

Establish essentiality and currency review program

PRE-CONTRACT PROJECT BRs

Document BRs associated with interfaces
Document BRs associated with previous decisions
Document QA related BRs
Document rules related to page-based look & feel, and IETM look & feel if using a predefined viewer
Coordinate pre-contract project BRs with LOGSA

CONTRACTING/ACQUISITION

Prepare CLINs
Prepare SOW
Prepare document summary list
Prepare contract exhibits
- Prepare project BRs DID documents

Contract clauses
- Secure data rights

Prepare CDRL (DD Form 1423)

POST-CONTRACTING PROJECT BRs

Determine all remaining project BRs
Coordinate project BRs with LOGSA, as applicable
- Coordinate new ICs, ICVs, and information names with LOGSA
- Coordinate wiring BRs with LOGSA
- Coordinate applicability BRs with LOGSA

DEVELOP TECHNICAL DATA

Develop document management plan
Gather source data
Prepare Business Rules Exchange (BREX) file
Create formal DMRL
Develop and implement QA plan
Create initial CSDB Status List (CSL)
Develop data/Create CSDB

POST-DEVELOPMENT TASKS

Distribution of Preliminary Technical Manuals
Validation
Submission of manuals to LOGSA and APD
Verification
Authentication and distribution of publications
Sustainment

4 Preliminary Planning

Perhaps more than any other technical data standard, S1000D emphasizes the importance of planning. Proper planning of business rules and requirements early in the project life cycle are critical for a project's success.

4.1 S1000D Education

S1000D projects have many things in common with technical data projects involving other standards such as MIL-STD-40051 or MIL-STD-38784. All require planning, have similar contracting needs, use markup (SGML or XML), and all must comply with a wide range of Army and DOD policies and regulations.

But S1000D represents enough of a departure from typical technical data projects that a certain amount of education is required to ensure that project personnel can competently complete their tasks. It is important that project personnel become familiar with S1000D-unique concepts such as data modules, the Common Source Data Base (CSDB), and information codes.

For additional guidance and policy requirements, see S1000D, MIL-STD-3031, and S1000D Basic Training.

4.1.1 Become familiar with S1000D

A good starting point is to become familiar with the S1000D specification document itself. It is organized in the following chapters:

Chapter 1 – Introduction describes topics related to the use and management of S1000D. Program managers and project team members should read and understand this chapter completely.

Chapter 2 – Documentation process further describes the use of S1000D including details about business rules. Program managers and project team members should read and understand this chapter completely.

Chapter 3 – Information generation is the most detailed chapter that explains authoring and illustration rules for all the schemas including details about every S1000D element and attribute. Program managers should become familiar with the contents of this chapter to know where to look to find answers to questions. Technical data authors should be intimately knowledgeable about Chapter 3.

Chapter 4 – Information management describes topics related to the CSDB, data modules, data module codes, and other numbering systems used by S1000D. Program managers should become familiar with the contents of this chapter to know where to look to find answers to questions. They should read and understand the chapters related to the pre-contract project decisions (see 5). Technical data authors should be intimately knowledgeable about Chapter 4.

Chapter 5 – Information sets and publications describes the concept of information sets (Chapter 5.1) and provides sample information sets (Chapter 5.2) and sample publications (Chapter 5.3). The sample information sets and publications in Chapter 5 should not be used by Army programs. Instead use the information sets and content selection matrices provided in MIL-STD-3031 (see 4.4). Program managers should be knowledgeable about the concept of information sets; they should know how the content requirements in MIL-STD-3031 provide the requirements for Army information sets.

Chapter 6 – Information use/presentation describes the look and feel requirements for both page-oriented and Interactive Electronic Technical Publications (IETP). Chapter 6 also contains the S1000D functionality matrix and associated functionality definitions. Program managers should be familiar with all of Chapter 6; they should be knowledgeable about Chapter 6.4 Information presentation/use – Functionality (see 5.4).

Chapter 7 – Information processing describes technical information associated with the process data module and the generation of publications. Program managers should become familiar with the contents of this chapter to know where to look to find answers to questions. Technical data authors responsible for producing IETP should be intimately knowledgeable about Chapter 7.

Chapter 8 – Standard numbering systems, information codes, and learn codes provides reference material associated with various S1000D numbering. Program managers should become familiar with the contents of this chapter to know where to look to find answers to questions. The standard numbering system (SNS) chapters will be important if the project is using one of the S1000D maintained SNS structures. If the project is not, the SNS chapters will not be needed (see 4.8). The information code data provided here should be disregarded as it is repeated and enhanced with more details in MIL-STD-3031. If the project is producing training data using data modules, the learn code chapters will be important; if not, the chapters will not be used (see 4.10.1).

Chapter 9 – Terms and data dictionary contains the glossary and list of acronyms for S1000D. Program managers should be knowledgeable about the listed terms and acronyms.

4.1.2 Become familiar with Army Business Rules

S1000D business rules for a project actually consist of several layers of rules from different organizations that dictate requirements down to the project level. First, the S1000D layer includes all the requirements defined in the specification itself. Next for Army programs, is a Joint Services (or DOD) layer. All the Joint Service business rules are documented in the Army business rules (MIL-STD-3031) which, not surprisingly, also contains all the business rules for the Army. The final layer of business rules are those rules that can be established at the project level. It is important to understand that each rule set at a higher level effectively reduces the number of available decisions that can be made at a lower level. It is equally important to understand that a lower level (e.g., project level) cannot make a decision that over-rides or negates a decision made at a higher level (e.g., Army).

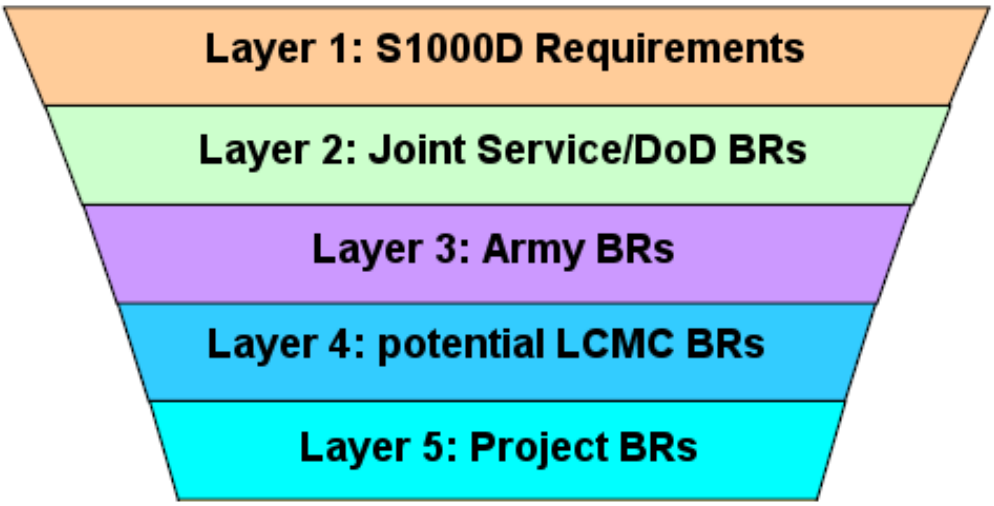

Figure 1 – Business Rules Layers

MIL-STD-3031 contains the Army business rules for producing S1000D data. It is mandatory that the business rules contained in the standard be followed for all S1000D projects in the Army.

It is important that program managers and project team members become familiar with MIL-STD-3031. The document provides the business rules that are required for all Army programs. All of these business rules are intended to reinforce Army policy and requirements. Many were derived directly from existing legacy standards. The document also identifies project business rule decision points where individual projects can make decisions to further tailor S1000D to their specific needs.

Section 5 (Detailed Requirements) of MIL-STD-3031 is organized in parallel to S1000D itself:

Sections 5.1 to 5.3 provide Army business rules for the general issues and concepts described in S1000D Chapter 1. Program managers should be knowledgeable of these sections.

Section 5.4 provides Army business rules related to issues and concepts described in S1000D Chapter 2. Program managers should be knowledgeable of this section.

Sections 5.5 to 5.61 provide Army business rules for the authoring issues and concepts described in S1000D Chapter 3. Program managers should be familiar enough with these sections to know where to find information when they need it. Technical data authors should be knowledgeable of the information in these sections.

Sections 5.62 to 5.91 provide Army business rules for the data management issues and concepts described in S1000D Chapter 4. Program managers should be familiar enough with these sections to know where to find information when they need it. Technical data authors should be knowledgeable of the information in these sections.

Sections 5.92 to 5.137 provide business rules for the Army information sets (content requirements) that replace the contents of S1000D chap 5. Program managers and technical data authors should be knowledgeable about the sections that pertain to their project. Individuals who have experience with MIL-STD-40051 and the other legacy Army technical data standards should already be familiar with the requirements described in these sections.

Sections 5.138 to 5.146 provide Army business rules for presentation and functionality issues and concepts described in S1000D Chapter 6. Program managers will use the functionality matrix information very early on in the acquisition process. Technical data developers need to be aware of all the business rules that define presentation requirements for their technical data.

Sections 5.147 to 5.156 provide Army business rules for information processing issues and concepts described in S1000D Chapter 7. Program managers should be familiar enough with these sections to know where to find information when they need it. Technical data authors who are producing IETPs should be knowledgeable of the information in these sections.

Sections 5.157 to 5.168 provide Army business rules for issues and concepts described in S1000D Chapter 8. Program managers should be knowledgeable about the information in these sections.

No business rules pertain to S1000D Chapter 9.

MIL-STD-3031 also has the following appendices:

Appendix A contains the content selection matrices. These are very similar to the content selection matrices provide in MIL-STD-40051. Editable versions of the matrices can be downloaded at (https://www.logsa.army.mil).

Appendix B contains the Army information codes. This appendix provides more detailed information than what is found in S1000D Chapter 8.4. Just like S1000D Chapter 8.4, Appendix B provides all the available information codes and information names. However, Appendix B also provides all the Army information code variants and their associated information names.

Appendix C contains the project decisions table. Throughout MIL-STD-3031, project business rules decision points are identified. Those project decision points are reproduced here in Appendix C to provide projects with a consolidated list to ease the documentation of their decisions. An editable version of the table is available for download at (https://www.logsa.army.mil).

Appendix D contains the functionality matrix. This is similar to the matrix provided in MIL-STD-40051. An editable version of the matrix is available for downloaded at (https://www.logsa.army.mil).

4.1.3 Complete S1000D Basic Training

It is also recommended that programs participate in additional S1000D training. Training is available from a number of different vendors, including training dedicated to specific roles within the project team. LOGSA also provides training materials (available at https://www.logsa.army.mil) for programs to conduct their own training. These training materials are provided free of charge to help programs improve their understanding of S1000D concepts, LOGSA does not provide personnel or other labor support to physically conduct any training classes.

4.2 Identify representative(s) to attend S1000D and IETP community meetings

In addition to the various documents that should be read and training classes that can be taken, support groups and events can assist S1000D program teams. These groups and events can help your program understand S1000D and they can help you work through problems as your program experiences them.

S1000D is managed by the S1000D Steering Committee. The Steering Committee is responsible for coordinating requirements and change proposals from around the world to determine how S1000D can be improved. Representatives to the Steering Committee are selected through a process to ensure equal voices by nations, industry, and defense. U.S. interests are represented at the Steering Committee by the United States S1000D Management Group (USSMG) Co-Chairs, consisting of one industry chair and one DOD chair.

The USSMG is responsible for coordinating all U.S. requirements for S1000D. All S1000D interested parties are encouraged to attend the monthly USSMG telecons. It is recommended that program managers participate in the USSMG meeting so they can be aware of pending changes to S1000D, suggest changes to S1000D that are needed by their program, and to participate in discussions that will help them work through programmatic problems.

The USSMG has a technical working group called the United States S1000D Implementation Group (USSIG). This group is responsible for proposing technical solutions to implement requirements determined by the USSMG. The USSIG also works closely with the international technical implementation team (the Electronic Publications Working Group (EPWG)). The USSIG (and the EPWG) also are great forums for discussing and working through technical problems associated with implementing S1000D. It is beneficial that lead members of the technical data authoring team participate in these organizations.

Membership in both the USSMG and USSIG can be requested at https://ussmg.btas.com.

LOGSA chairs the USSMG Land Working Group. Meetings for this organization are usually held concurrently with Army Interactive Electronic Technical Manual (IETM) Subject Matter Expert Committee (SMEC) meetings. Program managers involved with S1000D projects are encouraged to participate in these meetings to share knowledge and learn from other programs. This is also the body that determines opinions regarding requirement changes for both S1000D and the Army business rules (MIL-STD-3031). Information about these meetings is typically publicized via the USSMG Web site (https://ussmg.btas.com).

In order to benefit from knowledge sharing, a program should also participate in the following events:

a. AIA Spring Product Support Conference – This conference is typically held in early May. The conference themes typical focus on relevant defense logistics topics.

b. The Spring AIA Joint Services Tech Pubs Workshop – This is usually held each May in Clearwater Beach, Florida, immediately following the AIA Spring Product Support Conference. It is typically 2 days long and focuses on U.S. military technical data and S1000D issues of interest.

c. S1000D User Forums – These conferences, sponsored by the S1000D Steering Committee, are usually held once each year. The focus is always on S1000D and S1000D-related topics. The user forum's location typically alternates between Europe and the United States.

d. From time to time, vendors or groups of vendors also sponsor forums dedicated to S1000D-related issues. These can be helpful to improve a program's understanding and implementation of S1000D.

4.3 Identify and register model identification code(s) with NAMSA

S1000D data module codes contain a model identification code that identifies the equipment or product to which the data applies. The model identification code is established early on in the project and can be up to 14 characters long.

The Army business rules require that model identification codes are composed of the system designator (Mission Design Series (MDS) designator or equivalent) and an optional end item Usable On Code (UOC). The rational behind the first part of this rule is to encourage the use of popular equipment names in the model identification code.

Popular names, like MDS designators, are typically assigned to a major item of equipment for use in publicizing the item and for ready reference identification. Decisions regarding assignment of the popular name will be made at a project level above technical data and must comply with the provisions in AR 70-1 and AR 70-50, but the popular name can be used as all or part of the model identification code.

In the example in Figure 2, the model identification code for the equipment (OH58KIOWA) is derived from the popular name which is OH-58 Kiowa.

Each MDS with the same basic mission and design number will normally keep the same popular name assigned to the original MDS, regardless of variations in manufacturer, operational use, or change in series.

Projects must apply to North Atlantic Treaty Organization (NATO) Maintenance and Supply Agency (NAMSA) for the allocation of their model identification codes. NAMSA ensures global uniqueness of all S1000D model identification codes. Only new project model identification codes need to be registered. If a project is leveraging already-developed data modules for a component with its own model identification code, it does not need to be re-registered. S1000D Chapter 4.3.1 describes the registration process which is easy and straight forward.

All Army model identification codes need to be coordinated with LOGSA by using AMC Form 1217-R-E which is found in AMC-R 25-76 (also see 4.5).

For additional guidance and policy requirements, see S1000D, AR 70-1, AMC-R 25-76, and AR 70-50.

4.3.1 Document MI structure

The allocation of a model identification code for a project does not imply that all data modules and publications applicable to the project have to use the same code. It is likely that even moderately complex pieces of equipment will have more than one model identification code. It is recommended that the selection of model identification codes is planned carefully. It is common that some components and some subsystems (e.g., communication equipment, armament, engines, etc.) will have their own model identification number (and consequently, their own system breakdown and SNS). For example, a helicopter may use several model identification numbers as demonstrated in Figure 2.

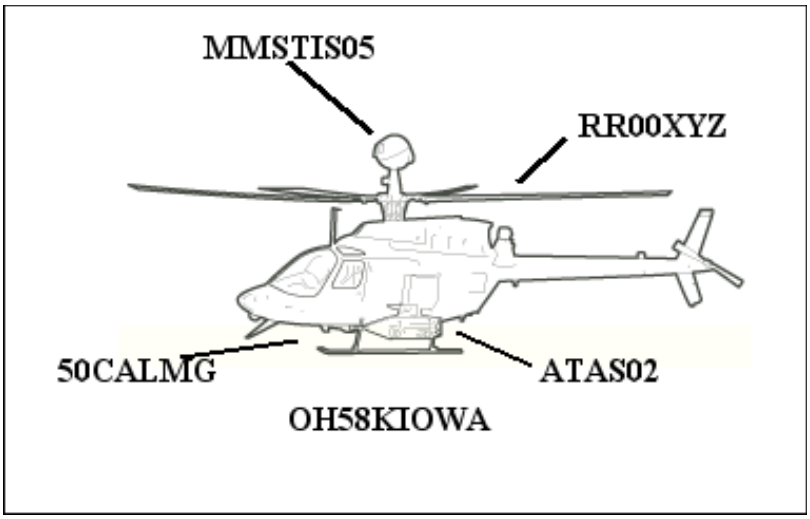

Figure 2 - Multiple Model Identification Numbers

In this fictional example, the fictional helicopter (model identification code: OH58KIOWA) has the following major components, each with its own model identification code:

a. Mast mounted sight thermal imaging system (MMSTIS05)

b. Rolls Royce engine (RR00XYZ)

c. Air-to-air Stinger missile system (ATAS02)

d. 50-caliber machine gun (50CALMG)

Two benefits come from uniquely identifying these subsystems and components. First, each will have its own SNS that will allow a more accurate SNS model. And second, the data modules for each uniquely numbered subsystem will be more easily shared with other weapons systems that also use the same subsystem.

It is easy to imagine that multiple weapons systems (both internal and external to the U.S. Army) will be using this same Rolls Royce engine. Because the engine has its own model identification code, all the associated data modules can be more easily reused by every platform on which it is installed. Without its own model identification code, the engine data modules would have to be recoded with the unique model identification number used by each separate platform.

A project should document its model identification structure. This structure will later form the skeleton for more detailed development of the SNS for the project. Figure 3 is a hypothetical model identification structure for the Kiowa helicopter shown in Figure 2.

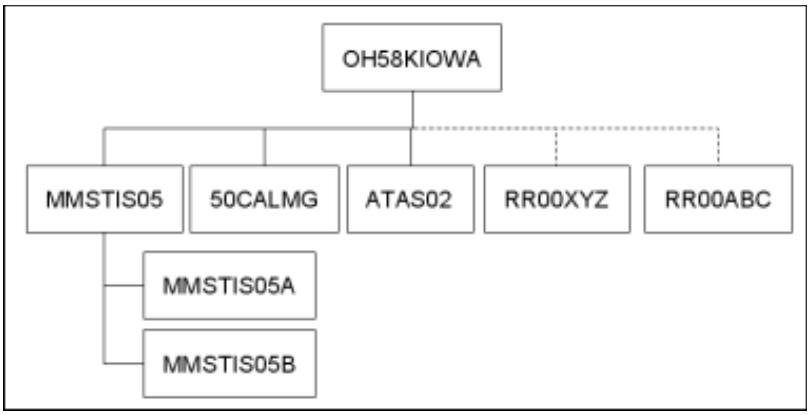

Figure 3 – Example Model Identification Structure

In this example, the components and subsystems that have their own model identification codes are identified and presented in the correct hierarchy relative to the primary equipment model identification code (OH58KIOWA). In this fictional example, two possible engines can be installed on the helicopter (RR00XYZ and RR00ABC). The dotted line represents the optional configurations. Two subsystems of the thermal imaging system (MMSTIS05) also have their own model identification codes (MMSTIS05A and MMSTIS05B).

Figure 3 is a simple representation of what a model identification code structure should look like. Obviously, very simple equipment may have only one model identification code and defining the structure will not be required; but, complex equipment (or systems of systems) will require a detailed structure that documents every model identification code used by the project.

4.3.2 Determine FSC sequence numbers

An Army S1000D publication module code is formed from six components which constitute the four attributes used in the publication module code. The first component and attribute, model identification code (attribute `modelIdentCode`), has already been described. The last component and attribute, volume number (attribute `pmVolume`), is self-explanatory. Refer to MIL-STD-3031 for additional information on the publication module code.

The publication module code also includes two other attributes: `pmIssuer` and `pmNumber`.

The issuing authority consists of five characters and is defined within the attribute `pmIssuer`. The Army combines two components for its definition: an issuing authority and a Federal Supply Class (FSC). The issuing authority is a single character allocated to a specific service. Refer to MIL-STD-3031 for additional information regarding issuing authority. The FSC, representing a class or group of the target equipment, constitutes the remaining four characters of the issuing authority. The Defense Logistics Information Service is responsible for the maintenance of FSCs (http://www.dlis.dla.mil/H2/default.asp).

Lastly, the number of publication consists of five characters and is defined within the attribute `pmNumber`. The Army also combines two components for its definition: a publication code and a sequential number. Refer to MIL-STD-3031 for a list of allowed publication codes. The sequential number, assigned by the project, constitutes the two remaining alphanumeric characters.

4.4 Create technical manual outline

An outline defining the scope of the technical manuals to be produced should be developed and maintained throughout the development of the data. An outline should be created whether the project is producing page-based publications, IETPs, or a combination. A well documented outline will ensure the project that the scope of the acquired content is sufficient to address the maintenance and operation needs of the equipment.

The guidelines set forth in the approved Logistics Management Information (LMI) or maintenance plan dictates the technical content of the publications.

A technical manual outline should be a detailed breakdown of the publications needed. It should include details such as descriptive, troubleshooting, and maintenance data required for each system comprising the weapon system or equipment. The outline should indicate if any information should be page-based or in IETP form. An outline should be developed reflecting each system, subsystem, equipment, or major component, as applicable. For each system, subsystem, equipment, and major component, the following types of data to be developed should be included in the outline:

a. Types of descriptive data (e.g., descriptive, theory of operation, use of controls and indicators, etc.).
b. Procedural tasks necessary to operate the system.
c. Test and troubleshooting.
d. Procedural tasks necessary to perform complete maintenance.
e. Schematics and wiring information required.
f. Supporting information about the weapon system/equipment.

For additional guidance and policy requirements, see AMC-R 25-76 and MIL-STD-3031.

4.4.1 Identify publications to be produced

Appendix A of MIL-STD-3031 includes a list of manuals typically prepared for Army equipment (the list from MIL-STD-3031 is reproduced in Table I). From this list, the program should select the manuals that will be required to support the subject equipment. This list of publications to be prepared is the starting point for developing a technical manual outline.

Each publication must contain, in detail, the maintenance coverage prescribed for the applicable maintenance level(s) based on the maintenance concept in accordance with the LSA or LMI, the Level of Repair Analysis (LORA), or an approved Maintenance Plan (MP). The following types of manuals are covered by the Army content selection matrices:

Table I – Publications Types

Front and Rear Matter
IETP Introductory Matter
Page-Based Front Matter
Page-Based Front Matter – Reduced
Page-Based Rear Matter
Interactive Electronic Technical Publication (IETP)
Operator Interactive Electronic Technical Publication (IETP)
Operator & Field and Operator, Field, & Sustainment Maintenance Interactive Electronic Technical Publication (IETP)
Aviation Interactive Electronic Technical Publication (IETP)
DMWR & NMWR Interactive Electronic Technical Publication (IETP)
Excluding Conventional and Chemical Ammunition
Operator's Manual
Sustainment Maintenance Manual including Parts List
Field and Sustainment Maintenance Manual including Parts List
Aviation Field Maintenance Manual including Parts List
Parts and Special Tools List
Depot Maintenance Work Requirements (DMWRs) and National Maintenance Work Requirements (NMWRs)
DMWR with Overhaul Standards
Aviation Field Troubleshooting
Aircraft Preventive Maintenance

Aircraft Phased Maintenance Inspection Checklist

Conventional and Chemical Ammunition

Operator's Manual

Sustainment Maintenance Manual

Field and Sustainment Maintenance Manual

Specialized Content

Hand Receipt Technical Manuals

Supplemental Information for Commercial off-the-Shelf (COTS) Manuals

Preventive Maintenance Checklists

Modification Work Orders (MWOs)

Battle Damage Assessment and Repair (BDAR)

Preparation for Shipment of Army Aircraft Manuals

Depot Maintenance Work Requirements (DMWRs) for Maintenance/Demilitarization of Conventional and Chemical Ammunition

Munition Equipment and Ammunition Data Sheet Manuals

Aircraft Operator Technical Manuals

Aircraft Operator Checklist

Maintenance Test Flight Manual

Demilitarization of Surplus Military Items Manuals

Warranty Technical Bulletins (WTBs)

Destruction of Equipment to Prevent Enemy Use Manuals

Depot Test, Measurement, and Diagnostic Equipment Manuals

The manuals listed represent the typical requirements for an Army program. Depending on the equipment, intended use, or other factors, a program may elect to combine some of these manuals into a single IETP or book, and they may elect to acquire manuals in addition to those listed.

It important to note that while certain publication types listed in MIL-STD-3031 are identified as “IETP,” any non-interactive content may be produced as IETP or page-based manuals. Interactive content, like diagnostics, can obviously only be produced as an IETP. Content listed above may also be combined with other content to produce more inclusive manuals for a project. For example, a field and sustainment maintenance manual may be augmented with specialized content such as munition equipment and ammunition data sheets or preventive maintenance checklists. Further, the manual could be produced as either a page-based or IETP (even though it is not identified as an IETP in the previous list).

It is intended that the applicable front and rear matter content be matched up to the necessary content publication types in the list. For example, a program could require a single IETP to address the following content:

a. IETP Introductory Matter
b. Field and Sustainment Maintenance Manual including Parts List
c. Supplemental Information for COTS Manuals
d. Battle Damage Assessment and Repair (BDAR)
e. Demilitarization of Surplus Military Items Manuals
f. Destruction of Equipment to Prevent Enemy Use Manuals

The list of publications to be prepared may include other publications identified by the project. These other publications may include legacy data that already exists in a format other than S1000D. The list of publications should include separate publications for each instance of a particular manual. For example, if different operation manuals are required for different models of the product, each manual should be listed separately.

A list of publications to be prepared should include publication titles, medium (page-based, IETP, or both), and publication module codes (if known). Projects may also require that each publication listed refer to the information sets or Data Module Codes (DMCs) (from the DMRLs) that are contained in the publications. In most cases, this information will not be known until after contract award.

The traditional Army process differs slightly from the process described in S1000D Chapter 2 (see Figure 4). In a typical Army technical data acquisition, the types of publications are chosen early on in the process, and then the content requirements of those publications (information sets) are determined. With the process described in S1000D, publications are agreed on after the information sets have been determined. Either method can result in satisfactory technical data deliverables; the most important issue is that the process needs to ensure the development and delivery of content covering sufficient breadth and depth. With S1000D, the key components for achieving this are the definition of the information sets and the DMRL. If a project has acquired the correct data modules (as guided by the information sets and defined by the DMRL), producing the proper publications is an easier task.

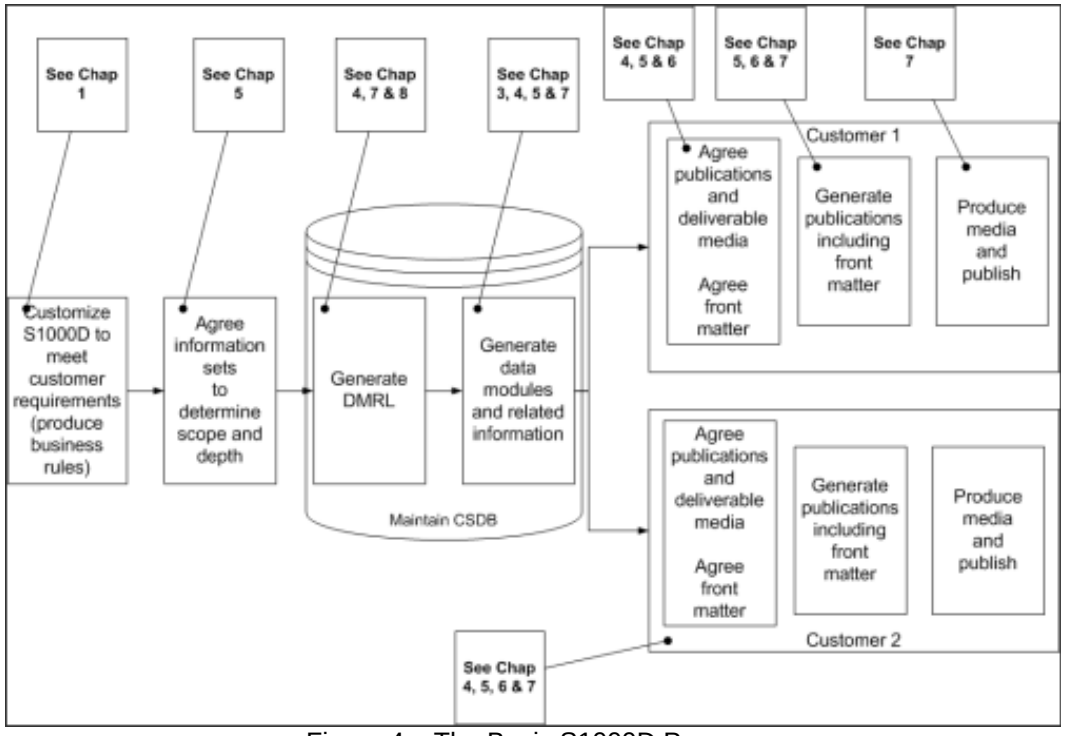

Figure 4 – The Basic S1000D Process

4.4.2 Identify information sets

The content selection matrixes in MIL-STD-3031 list the content requirements for each of the Army technical publications listed in Table I. After the publication types have been identified, the project must next use the matrices to tailor the technical content requirements within each.

The matrices are divided into information sets and further subdivided into content requirements. For example, Figure 5 is a portion of the Operator's Manual publication type, and the Chapter 1 information set is subdivided into numerous content requirements (General information, scope, Ozone Depleting Substances, etc.).

Table A-X. Operator's Manuals (Excluding Conventional and Chemical Ammunition).

Content	Operator Req'ment	Operator & Field Req'ment	Operator, Field & Sustainment Req'ment	Ref.	PM Type	DM Type	Info Code	ICV	Info Name
Front Matter	R	R	R	5.130	Front Matter PM				
Chapter 1. General Information, Equipment Description and Theory of Operation	R	R	R		Chapter PM				
General Information	R	R	R	5.95.3		Descriptive	010	A	General Data
Scope	R	R	R	5.95.3.1.2					
Ozone Depleting Substances (ODS)				5.95.3.1.3					
Destruction of Army Materiel to Prevent Enemy Use	R	R	R	5.95.3.1.4					
Preparation for Storage or Shipment	R	R	R	5.95.3.1.5					
Nomenclature Cross-Reference List				5.95.3.1.6					
List of Abbreviations/Acronyms	R	R	R	5.95.3.1.7					
Safety, Care, and Handling	AR	AR	AR	5.95.3.1.8					
Calibration				5.95.3.1.9					
Supporting Information for Repair Parts, Special Tools, TMDE, and Support Equipment	P			5.95.3.1.10					

Figure 5 – Information set example

The matrices list content requirements along with corresponding data module types, information codes, information codes variants, and information names. The matrices describe content that is both mandatory (R = required), optional (blank or AR = As Required), and not allowed (P = Prohibited).

A project should review each optional content requirement. For each content requirement that is identified with AR or a blank cell, the project needs to determine if the corresponding equipment or condition is or could be applicable to the project's equipment. If so, the content is required; if not, the content is not required. For example MIL-STD-3031 specifies certain conditions that require the Safety, Care, and Handling content (e.g., Ammunition, Electrostatic Discharge-effected components). If any of these conditions are met, the project should indicate that the content is required.

The project must also review each truly optional (identified as blank) content requirement to determine if any of those content requirements are needed by the project.

Every content selection matrix for each required publication type should be completed. The content requirements described by the completed content selection matrices identify the publications and information sets that must be produced for the project.

Each matrix describes the publications to be produced.

Each information set (with each matrix) defines content depth requirement.

The content requirements define the components of the information sets that are required.

The content requirements listed in the matrices have references to the narrative content business rules in MIL-STD-3031. These narrative content business rules provide the detailed requirements necessary to guide the preparation of effective technical data.

The information set and content business rules provides the author with a description of the content that must be developed through the production of data modules. For example, the content selection matrix might indicate that a particular publication must have front matter, general theory of operation, emergency procedures, and rear matter information sets. And the content business rules describe the details that must be prepared for each of the content requirements within the information set.

MIL-STD-3031 provides the content business rules that should be used for Army technical publications. These content business rules supersede and replace the example narrative information sets provided in S1000D Chapter 5.2.

Copies of the applicable content selection matrices should be completed and added as part of the Technical Manual Contract Package (TMCP). Properly completed content selection matrices are used as the final technical manual outlines and as primary input to the initial DMRL. It becomes binding when it is made part of the contract, statement of work, or other contractual instrument.

It is likely that a project may have a content requirement that is not contemplated by MIL-STD-3031. When this occurs, the project should develop comparable content selection matrices, information sets, and content business rules to properly define their content needs. These project-unique information sets should be coordinated with LOGSA. It is possible that the project-unique information sets may be useful to other programs and be included in future releases of MIL-STD-3031.

4.5 Schedule the publication(s)

As with legacy technical manuals, all planned publications need to be scheduled with LOGSA using AMC Form 1217-R-E and should follow the process described in AMC-R 25-76. Programs planning to produce data compliant with S1000D should also use AMC Form 1217-R-E to submit the model identification codes that have been registered with NAMSA (see 4.3).

For additional guidance and policy requirements, see AMC-R 25-76.

4.6 Create draft DMRL

The DMRL is used to identify the required data modules for a project. The process diagram (see Figure 6) illustrates how the development of the DMRL is tied into the larger process. The first two steps (Select Publication Types and Content Selection) select info sets, data module types, and info codes are described in 4.4.

In the third step, Create Draft DMRL, the draft DMRL is initially derived as an output of the first two steps. The completed content selection matrices describe the content depth that is required for a project, and the information sets describe the content requirements. But both of these artifacts lack the necessary description of depth, quantity, and other details that are required to sufficiently scope the content that must be developed. The DMRL closes this gap.

As an example, the content selection matrix provides a means for indicating that the project requires a maintenance publication (or maintenance content in an IETP), and it describes the breadth of the maintenance content (i.e., the procedures and content that are required within the maintenance publication). But it does not describe the specific data modules required to deliver that content, so the data can sufficiently cover all components of the materiel and as well as all configurations of the materiel.

More specifically, the content selection matrix will indicate that lubrication procedures are required as part of maintenance procedures and it (along with the information set business rules) describes the depth that is required within lubrication instructions. It does not, however, indicate the specific components of the materiel to which the lubrication instructions apply. It is likely, even on moderately complex equipment, that numerous different lubrication procedures will apply to numerous different parts of the materiel. Each of these lubrication procedures requires a separate data module.

The DMRL is the instrument used to define the quantity as well as types of data modules required by the project. In this continued example, the content selection matrix is used by the project to indicate that lubrication procedures will be required, and that those procedures will be produced with procedural data modules using a specified information code and information name. The lubrication-related business rules provide the content requirements. The DMRL will further indicate each instance of a lubrication procedure data module that will be produced.

At this part of the process, projects will be able to begin to identify where they will be able to reuse data modules (i.e., the same procedure with the same MODELIC, even though used in different contexts or manuals, should use the same data module).

The DMRL also provides additional details relative to the required data modules. These details include the data module code, data module status, data module title (technical name + information code), issue number, issue date, etc. The DMRL is also used to document and track a complete picture of the project's data modules despite their possible development by multiple vendors.

The DMRL is initially developed at the earliest stages of the project (before contract award if enough information is known), and it is continually updated as project planning progresses. The DMRL is considered "formal" when the Government and vendor are satisfied that it accurately describes all data modules known to be required by the project to satisfy content requirements. The formal DMRL becomes a part of the contract documents and the data modules listed in the DMRL become required deliverables for the vendor. The formal DMRL can be modified, but only after an agreed upon change occurs in contract scope. Adding or removing data modules from the formal DMRL requires agreement by both the Government and the vendor.

Steps 1 through 5 in Figure 6 illustrate the above described business process flow from start of work through the development of the formal DMRL. Steps 6 and 7 put these processes into context with the overall publication process.

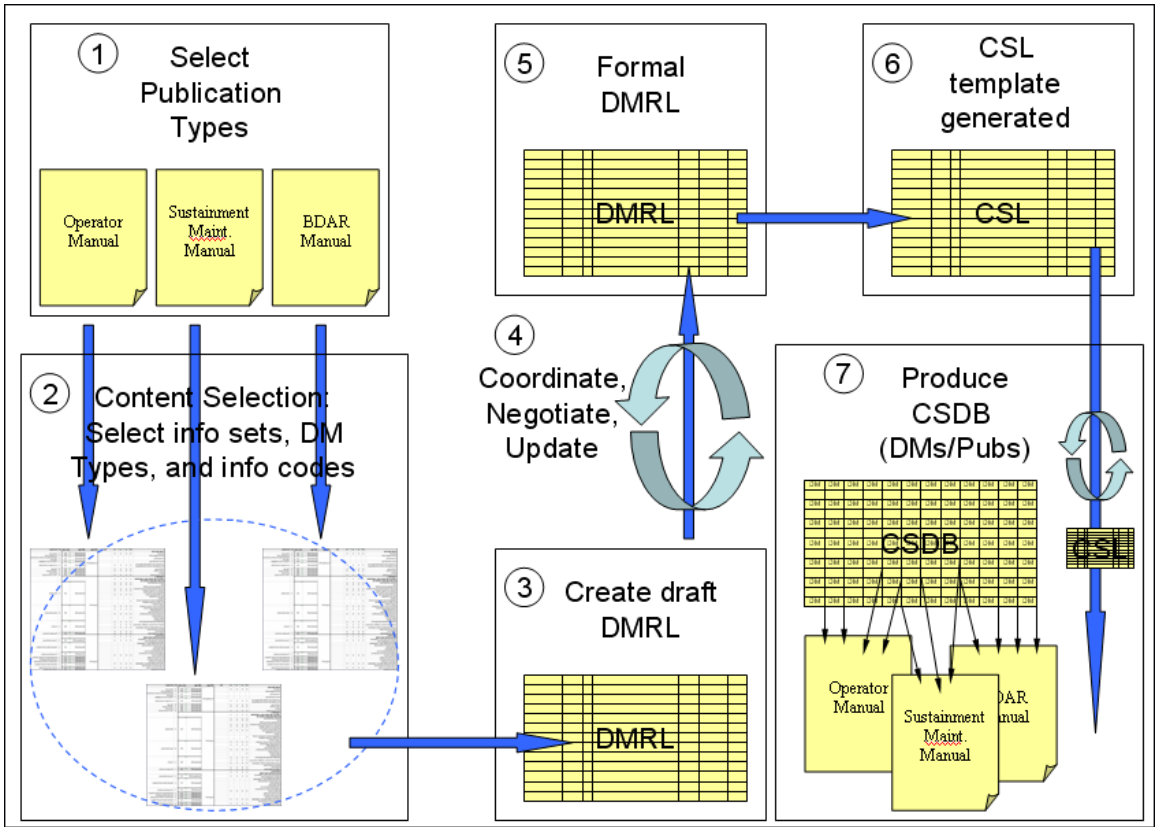

Figure 6 – DMRL Process

4.7 Identify functionality

Information sets, content selection matrices, and the DMRL are tools for defining a project's content depth and breadth. In contrast, the functionality matrix is a tool for defining the intended use and capabilities of the project's IETP data. The functionality matrix provides a standard format for documenting the IETP functional needs of the project, using the functionalities defined in S1000D Chapter 6.4.

Projects should complete a functionality matrix in conjunction with content selection if an IETP is going to be produced. Representatives of all project stakeholder organizations should be involved in order to ensure that all needs are covered by the solicitation. Appendix D of MIL-STD-3031 includes an Army-specific functionality matrix. This matrix is available online in Microsoft Excel format (URL).

S1000D Chapter 6.4 provides instructions for completing the matrix and MIL-STD-3031 describes ways that a project can enhance the functionality identification process. Guidance or instructions regarding project–specific processes for completing the matrix should be provided to all participants. The completed matrix will become part of the contract documentation.

The completed matrix is also a good tool to use for price and cost analysis. An acquisition officer can review the pricing and evaluate the costs and benefits associated with the IETP as proposed. It may be that some higher-cost functionality requirements can be traded for others with lower costs. Also, the matrix should not be considered final until prospective contractors have responded to it. Contractors may wish to propose additional functional requirements or some tradeoffs. (Of course, any added functionalities need to be reflected in the content specified and other product plans.)

Using the Army's matrix ensures that all acquired IETP functionalities are accurately specified and defined. Once acquisitions staff, contractors, and any other stakeholders involved have agreed on the content and functionalities, everyone involved will have a clear shared understanding of what developing the manual will entail.

For additional guidance and policy requirements, see MIL-STD-3031.

4.8 Identify SNS

Identifying the standard numbering system for a project's technical data is likely to be something of a moot decision. The SNS structure for many projects will be predetermined by the engineering data (Logistic Support Analysis Record (LSAR), or GEIA-STD-0007). In these cases, it is important that the entire SNS structure is understood by the technical data project team. It is likely that the pre-determined SNS may need to be extended to account for technical data that is outside the scope of the engineering source data. Situations that may require an extension of the pre-determined SNS may include SNS to cover support equipment, SNS to cover unique in-field modifications or manufactured parts, or for the use of the S1000D Generic SNS.

The S1000D Generic SNS is used when a data module is used across multiple model identification codes or if it applies to no specific model identification code. For example, in ground handling situations where the same procedure applies identically to multiple pieces of equipment, the Generic SNS may be used.

GEIA-STD-0007 is the preferred format for LSAR data and the preferred source for a project's SNS. The Army's intent is to promote the probability of data exchange, even when programs have not anticipated this requirement. It is not desired to force any program to use or develop an LSAR when it is not necessary.

In situations where the project has no pre-determined SNS, the project can elect to use one of the maintained SNSs from S1000D Chapter 8, or the project team can develop their own. When developing an SNS, it is critical that all systems, subsystems, sub-subsystems, components, and configurations be considered. This is likely to be an iterative process that requires the SNS to be extended and modified as data is developed.

4.9 Determine if reusable data exists

In the steps completed to this point, much of the activity is focused on determining the scope of technical data that is needed by the project. With this information thoroughly understood and documented, it is now time to determine if any of the data already exists and is owned by the Government. Ideally, some data will have already been developed previously for similar projects or previous projects that use the same or similar components or support equipment.

A project should make efforts to determine if and where this data exists as well as determine ownership and reuse rights. Searching for reusable data should include, but is not limited to, the following possible sources: the original equipment manufacturer (OEM), other Army programs, and other U.S. services. In a best case scenario, other data will exist already authored in data modules according to the correct issue of S1000D.

If reusable data modules are identified, the project should coordinate usability of COTS or other military service manuals with the Training and Doctrine Command (TRADOC) proponent.

For additional guidance and policy requirements, see AMC-R 25-76 and MIL-STD-3031.

4.9.1 Are COTS manuals available?

If the OEM COTS manuals exist, the program should follow the process described in MIL-PRF-32216 to determine if the COTS manuals are adequate as is, if they require supplementation, or if they are inadequate. If the COTS manuals are usable, the project should then determine if intellectual property rights, copyrights, and other reuse terms are acceptable to the project. If acquisition and use of the COTS manuals are practical, the data should be acquired and reused. See MIL-PRF-32216, AR 25-30, and AR 25-32 for additional information.

The project should determine the best way to integrate COTS manuals with the data modules that will be authored specifically for the project.

4.9.2 Does reusable legacy data exist?

The project should also determine if Army, other military service (Air Force, Navy, or Marine Corps), or the Defense Logistics Agency (DLA) have an existing publication that may be adopted and supplemented by specialized Army maintenance data (e.g., lubrication orders, maintenance allocation charts). If the legacy data is usable, the project should then determine if intellectual property rights, copyrights, and other reuse terms are acceptable to the project. If acquisition and use of the legacy data are practical, the data should be acquired and reused.

The project should determine the best way to integrate legacy data with the data modules that will be authored specifically for the project.

4.9.3 Do reusable data modules exist?

If legacy data exists, it is possible that the data is already authored in S1000D data modules. If the legacy data modules are usable, the project should then determine if intellectual property rights, copyrights, and other reuse terms are acceptable to the project. If acquisition and use of the legacy data modules are practical, rights to the data should be acquired. It is important to enter into a memorandum of agreement with the source of the data modules so that future changes (sustainment) of the data modules can also be reused.

The project will need to carefully understand the business rules used to develop the legacy data modules as well as the data module coding strategy used by the authoring project. It is necessary to have access to the source BREX file. Compromises may need to be made regarding business rules and the data module code attributes so that the legacy data modules can be reused without re-authoring.

It is best to not re-author the legacy data modules so that version control integrity of the data modules can be maintained to reduce sustainment costs.

4.9.4 Coordinate legacy data use BRs with LOGSA

As the project develops and documents business rules associated with the reuse and sustainment of legacy data (whether COTS, S1000D data modules, or data written to another specification), the business rules should be coordinated with LOGSA. LOGSA is interested in learning from the experiences of programs reusing legacy data so that the lessons learned can be shared with other Army programs and potentially integrated into future versions of MIL-STD-3031.

4.10 Coordinate with TRADOC schools

For most technical data projects, accompanying training materials will be required. The Training and Doctrine Command (TRADOC) schools should be involved in review, guidance, and verification issues related to the technical data. To that end, the project should coordinate with TRADOC to obtain required target audience description(s) and review(s) by appropriate TRADOC elements. See AMC-R 25-76 for additional information.

Interoperability of technical data and technical training data is a desired capability in military organizations. In the past, these two types of content have been treated and managed in separate systems due to organizational boundaries. Users requiring performance support, however, have expressed a desire to be able to draw on the resources of both of these systems equally. Also, configuration management of content in both realms depends on timely access to the other's data. The training community needs technical data in a timely manner to maintain product accuracy and integrity. The technical data community wants access to training information for product completeness.

This issue is further complicated by the fact that these two military communities use different specifications that achieve different objectives. The Shareable Common Object Reference Model (SCORM) is a reference model that assembles training files into an order and logic so a learning management system can track a learner's progress.

For additional guidance and policy requirements, see AMC-R 25-76 and MIL-STD-3031.

4.10.1 If learning content will be developed using S1000D, coordinate BRs with LOGSA

Training materials and curriculum can be prepared in multiple ways. Typically, the training materials will make copious use of actual technical data to more effectively teach the maintenance and operations concepts of the product. The acquisition and management of DOD technical data and its related technical training content can be synchronized. Curriculum developers and technical writers that support the same systems and equipment can coordinate their work to take advantage of interoperability and reuse. Technical data and technical training data can exist in compatible, standard formats so that editing and reusability are possible.

S1000D includes a Learning Data Module for easier development and management of technical training content. Technical data and technical training data can exist in compatible, standard formats so curriculum developers and technical writers that support the same systems and equipment can coordinate their work to take advantage of interoperability and reuse.

The Schema for this data module structures technical learning content and configures it to the system being taught in the lessons. It maintains the use of standard S1000D XML structures, so that both the technical data and its supporting learning content can be reused without the need for conversion from other formats. The S1000D metadata ensures that the technical training content stays current with other system documentation throughout the life cycle. At the same time, S1000D-prescribed tags reflecting the SCORM permit the training files to be assembled into a particular order and logic that enhances and verifies training progress.

If S1000D learning data modules are used, the project should document a plan for implementing learning content using S1000D data modules and non-proprietary methods and tools. This approach is new to the Army and there is little assistance available to a program relative to documented business rules, policy, or guidance.

Projects should coordinate learning data plans with LOGSA so that other programs can benefit from their experience and so that Army business rules, policy, and guidance can be developed.

4.11 Prepare MOUs

If more than one Life Cycle Management Command (LCMC), service, or organization is involved in the development or sustainment of the technical data, or if data modules or legacy data are being repurposed from another organization, the project should prepare a memorandum of understanding (MOU) covering individual responsibilities and specific managerial agreements, to include operational interfaces. If maintenance instructions for subsystems/components managed by other LCMCs are to be included in the technical data, this will be stated in the MOU. The MOU should address roles, responsibilities, authority, schedules, etc.

For additional guidance and policy requirements, see AMC-R 25-76.

4.12 Establish essentiality and currency review program

The project should conduct periodic essentiality and currency reviews to determine the continued need for the publications previously identified in 4.4. This process is unchanged by any aspect of S1000D.

For additional guidance and policy requirements, see AMC-R 25-76.

5 Pre-Contract Project Business Rules

As described in 4.1.2, layers of business rule decisions exist, some of which are determined by the project. These rules are identified in MIL-STD-3031 and are organized by S1000D chapter number. Organization by chapter assists projects in examining decision points while reviewing the corresponding guidance in S1000D as well as MIL-STD-3031. A consolidated list of project decision points is provided in Appendix C of MIL-STD-3031. Depending on the nature of the project business rule topic, some decisions should be made before contract award and some are made after contract award in collaboration with the selected vendor.

Decision points that have to do with clear project requirements (e.g., functionality, content depth, or deliverables) and those that affect project cost (e.g., scope) are among those that should be decided before contract award. Decision points that have to do with implementation methods (e.g., optional IETP functions) or other less critical options, as well as those that require collaboration with vendors and technical data subject-matter experts, may be determined after contract award.

The following subsections provide guidance regarding the business rule decision points in each chapter of S1000D that should be considered by acquisition professionals before contract award.

Chapter 1

All Chapter 1 business rules have been established in S1000D or MIL-STD-3031. No project decision points exist.

Chapter 2

All Chapter 2 business rules are established in S1000D or MIL-STD-3031. No project decision points exist.

Chapter 3

Chapter 3 contains the largest number of project decision points. These authoring and illustration rules are predicated on the content selected (information sets), as described in Chapter 5. (Note that the information sets themselves are not taken from Chapter 5; the Army has established its own, which can be found in Appendix A of MIL-STD-3031. See 4.4.2)

The decision points, that should be decided before contract award, generally fall into three categories:

- Rules that indicate what is to be delivered (i.e., functionality).
- Rules that describe external interfaces for the data (e.g., diagnostic tools or a parts ordering system).
- Decision points that are answered by existing policy (e.g., security-related rules).

However, many authoring rules describe “how” technical data is to be authored and delivered, so they can safely be determined after contract award. Examples of these are:

- Whether to use the attribute `issueType`.
- Method for distributing changed data modules where only the IDSTATUS section is changed and the CONTENT section is not changed.

Chapter 4

Chapter 4 contains some decisions that should be made before contract award: Examples are:

- Deciding the MI structure when multiple MIs may be used on a project (e.g., engines or common systems).
- Rules related to the use of LSAR data.

Chapter 4 also contains business rules that could be decided either before or after contract award without adversely affecting project scope. Examples of these are:

- Defining the valid CAGE codes for DMRL senders for a project.
- Deciding whether or not to use the element <remarks> in the DMRL.

Chapter 5

Business rule requirements related to content breadth and depth (information sets) are associated with Chapter 5. Projects should determine these content requirements before contract award. This includes the completion of content selection matrices (see Appendix A of MIL-STD-3031) and the draft DMRL (see 4.6).

Chapter 6

Chapter 6 contains some decisions that should be made before contract award. For example, projects must determine the data presentation medium (page-based, IETP, or both). They must also determine all functionality requirements of the IETP, which is done by completing the functionality matrix (Appendix D of MIL-STD-3031, see also 4.7).

Chapter 6 also contains business rule decisions that could be made either before or after contract award without adversely affecting project scope, such as optional IETP look-and-feel capabilities and requirements.

Chapter 7

Project decision points are found in Chapter 7. However, none of them is of the type that must be decided before contract award.

Chapter 8

Project decision points are found in Chapter 8. However, none of them is of the type that must be decided before contract award.

Chapter 9

No business rule decision points are related to Chapter 9.

5.1 Document BRs associated with interfaces

The project should determine which data interfaces will be needed and used with the equipment technical data. Figure 7 illustrates where S1000D data fits within other areas of product data that may require some degree of data interoperability or interchange for a hypothetical project. An actual project will typically have a subset of those represented in Figure 7. The project should determine and document all business rules associated with the applicable interfaces.

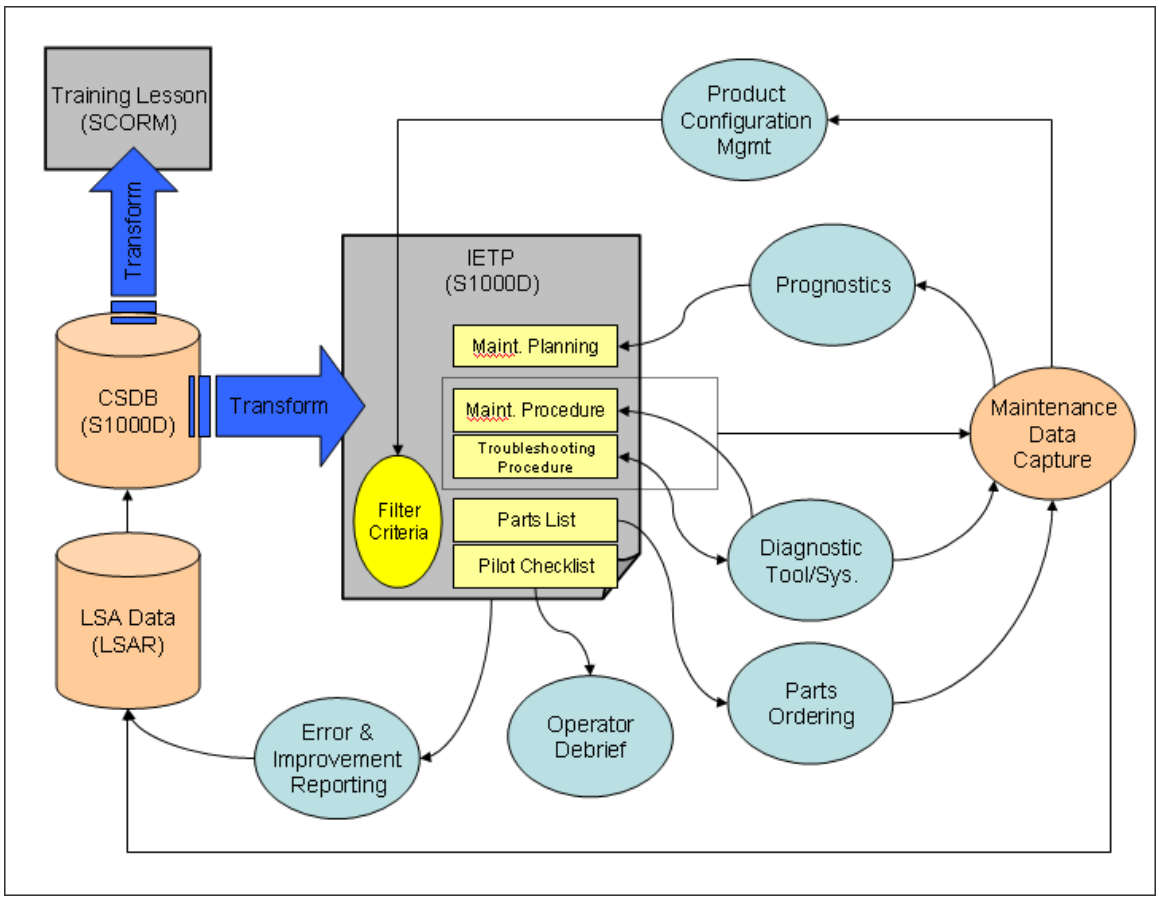

Figure 7 – Technical Data Interfaces

Some programs may have legacy systems and/or configuration management databases requiring interoperability. If this is the case, it is crucial that the project fully identify and define all (if any) interoperability requirements for the effort. The project should prepare to clearly define interoperability requirements in the Statement of Work (SOW), Statement of Objectives (SOO), or Performance Work Statement (PWS) and in the contract requirements document so all parties have a clear understanding.

Interfaces can be viewed in terms of interfaces to systems needed for producing and managing S1000D data or in terms of interfaces for interchanging data between S1000D data and other systems. The production and management interfaces include technical data content management systems, publisher/viewers, and data distribution systems.

The interchange interfaces are described in terms of data types that require interchange between systems, rather than by assuming the scope and functionality of systems that may be in a constant state of development. The business rules decisions needed at this point in the process deal with the requirements of the data to be interchanged regardless of the system that provides the interface.

IETPs can be used as the primary source for collecting and reporting operations, maintenance, historical, ammunition, and parts requisition data. IETP data can also be used to provide timely information on maintenance procedures, diagnostics, fault isolation, fault descriptions, parts data, and data combinations thereof which would be generated in accordance with a specific IETP.

This data can be collected in accordance with data standards for digital interchange with other systems (such as Product Life Cycle Support [PLCS], Machinery Information Management Open Systems Alliance [MIMOSA], Government Electronics and Information Association [GEIA] 0007, and MIL-STD-3008) or can be manually entered using forms.

Business rules need to be developed to ensure that the right types and format of data can be passed between each of the necessary interfaced systems.

LSA

LSA data includes a comprehensive list of data elements that can be generated as a result of the supportability analysis conducted during the design, development, and initial fielding of a system or end item. It captures information related to logistics design requirements, reliability and maintainability, system safety, maintenance engineering, support and test equipment, training and training devices, manpower and skills, facilities, transportation, supply support, and parts packaging.

The most important aspect of the data described by this interface is that it is used to generate the logistics support products (e.g., operator and maintainer publications, supply support lists, or training programs for operators/maintainers) required to sustain a system or end item. The data used to generate these logistics support products can be automatically filtered from the LSAR into an S1000D CSDB to initiate or update the required publications.

Product configuration management systems

Integrating an IETP with a product configuration management system gives technicians a view into the current state of the specific equipment they need to service, before they actually start work. S1000D provides a standard mechanism for directly incorporating product configuration data into the IETP. Depending on how the data is authored, this product configuration data can be used as a filter so that only the data that is applicable to the operator/maintainer is displayed.

Diagnostics/prognostics systems

Capturing data in the field, such as miles driven or configuration changes, and transmitting that information to inspection and maintenance programs is one way to improve preventive maintenance planning for equipment. The IETP can report fault codes back to program offices for prognostic analysis and condition-based maintenance initiatives that have the potential to extend the life of vehicles and systems. When the IETP is integrated with the platform, problems can be identified by communicating with the on-board diagnostic and prognostic systems and reporting any recent equipment/component changes. Platform sensors can identify which components have failed, or are nearing failure, and the information can be passed to the IETP, which can automatically help the maintainer perform further troubleshooting, make repairs, or direct the maintainer to the relevant parts information.

Diagnostics communications can be two way if the IETP content natively supports intrusive diagnostics; otherwise, this functionality is accomplished with an off-board diagnostics application or test set. The IETP can also retrieve fault codes from the platform's embedded diagnostic system. When connected directly to the platform, the IETP can automatically list the appropriate procedures and launch the proper forms.

Parts ordering

A significant amount of time and manual labor can be expended between the identification of a need for a part and the actual placement of an order for that part. In the typical manual parts-ordering process, the maintainer identifies a part requirement on the basis of existing knowledge or by using technical publications. Once the part number and other supporting information have been properly identified, a paper or electronic form is completed by the maintainer and the form is provided for entry into the supply system. For a paper submission, the information is re-keyed into the supply system, which then processes the order. The order is acquired first through retail stocks, and then through wholesale if the part is not available at the retail level. In the course of this process, it is quite possible that information will be transposed or relayed incorrectly, which will further lengthen the time and effort required to generate an order.

The use of IETPs introduces an opportunity to bridge or automate the current manual processes. This capability, although not unique to S1000D, is one of the decisions to be made as part of completing the functionality matrix. The matrix requires a decision as to whether to include a capability that would allow the maintainer to electronically generate an order directly into the supply system from the IETP, thus eliminating the manual steps that currently exist, and allowing the maintainer to continue to work without interruption.

If a decision is made to require this functionality, then the impact to S1000D data includes the need for links from the parts data to a parts ordering system. Data structures that support this capability already exist in S1000D; however, the project may wish to provide additional validation on the content of the data used for linking.

Other possibilities exist for integrating S1000D with parts data. A fault code could automatically launch the IETP, which would add that fault to the maintenance or inspection form and create a parts request for approval. If requirements have been defined for enabling the integration of product configuration data with the IETP, then the IETP could be authored to ensure the content could be filtered by serial number, and the IETP could ensure that only valid part numbers could be ordered. As noted below, specifying functionalities for interfacing systems such as parts ordering should result in documentation of S1000D data requirements to support these functionalities. These data requirements should be contained within the project business rules.

Operator Debriefing

Data fed from an operator's checklist (and other sources of the IETP) can be used to complete operator debrief requirements. This would most typically be used in an aviation environment, but could be used with other equipment as well.

Error and improvement reporting

The use of IETPs allows the change management process to be moved into an electronic environment. The use of an electronic error and improvement reporting capability within the IETP will allow the end user to specify changes needed within a data module. During the amendment cycle, this information can be passed to a publications authority. In an IETP environment, this transmission could even be made in real time, connectivity permitting. Decisions as to how the IETP should gather and report errors and improvements must be documented in the S1000D project business rules.

If an electronic process for reporting errors and improvements is not available (as is true with page-based implementations), DA Form 2028 is used to report errors and improvements.

For additional guidance and policy requirements, see MIL-STD-3031.

5.2 Document BRs associated with previous decisions

By this point in the process, the project will have made a substantial number of project decisions. In virtually every step along the way (4.3 through 5.2), the project has created multiple project business rules as a result of decisions made. It is essential that each of these project decisions is documented clearly so that the intent of the requirement is equally understood by both the Government and the vendor. Projects should use the table provided in MIL-STD-3031 Appendix C (and at https://www.logsa.army.mil) to document these decisions for later use in the DID for ARMY S1000D PROJECT BUSINESS RULES (DI-TMSS-81784).

For additional guidance and policy requirements, see MIL-STD-3031.

5.3 QA-related BRs

Quality Assurance processes are employed during multiple steps in the S1000D data module development process to ensure not only that the data is accurate but that it is created in accordance with standards and requirements. The purpose of the QA plan is to ensure that the contents of the publication are technically accurate. QA records should be documented and kept up to date.

It should be noted that S1000D Chapter 3.7 uses the term “first verification” as the equivalent of the Army’s traditional validation step that is performed by the contractor. S1000D uses the term “second verification” synonymously with the traditional verification step that is performed by the Government with the assistance of the contractor.

As with all technical data, an S1000D QA plan must be developed by the contractor in accordance with best practices and approved by the Government prior to data module creation or conversion. Any modifications to this plan during the period of performance must also be approved by the Government. Although development of a QA plan is the responsibility of the contractor, the parameters and expectations for the QA plan must be provided by the Government in the form of QA business rules that are developed at this part of the process. These business rules decisions include things such as rules governing first and second verification, and the timing and frequency of review cycles. Projects should also use the business rules to communicate any QA-related requirements that need to be satisfied by the vendor.

For additional guidance and policy requirements, see MIL-STD-3031.

5.4 Rules related to page-based look & feel, and IETM look & feel if using a predefined viewer

When the Army developed MIL-STD-3031, every effort was made to respect the presentation needs defined in MIL-STD-40051. The Army look and feel business rules (for both page-based and electronic publications) build upon the guidance described in S1000D Chapter 6 to reinforce the Army’s traditional presentation requirements. And like MIL-STD-40051 formatted publications, some aspects of look and feel are left up to the project.

Projects should make every effort to define project business rules related to presentation before contract award. It should be understood, however, that a chosen vendor may propose a viewing solution that self-defines many of the look and feel capabilities. Any selected viewing solution should comply with the requirements in S1000D and MIL-STD-3031, but the project should consider flexibility with project business rules related to look and feel when it comes to a viewer decision because it may lower costs. For example, a project may agree to accept a COTS viewer that satisfies 90% of their viewing requirements rather than developing a more expensive custom solution to satisfy 100%.

The project business rules associated with page-based presentation include:

- Defining required page sizes
- Defining when foldouts will be used
- Defining when color may or may not be used

The project business rules associated with IETP presentation include:

- Defining special needs for atypical display devices required by the project (e.g., hand-held display devices)
- Determining the use of an inner-shell status bar and an additional information bar
- Defining additional table of contents items
- Determining optional reset area functionality
- Using icons, text, or both for the main menu bar functions
- Deciding if alerts will be acknowledged before the user proceeds to the applicable step

For additional guidance and policy requirements, see MIL-STD-3031.

5.5 Coordinate pre-contract project BRs with LOGSA

After all possible pre-contract business rules are documented (using DID DI-TMSS-81784), the project should coordinate those rules with LOGSA (via e-mail to: logsa.tmss@conus.army.mil). One of LOGSA's objectives is to assist all programs across the Army with successful acquisition and implementation of S1000D technical data. One way they can accomplish this is to provide feedback to project business rules and to receive the results of real world experience as reflected in the project business rules. LOGSA will use the collective business rules from all S1000D projects to share lessons learned and to incorporate consensus project rules into future releases of MIL-STD-3031. If all projects share the same project business rule, it is likely that the rule should be an Army-wide rule so that future projects do not need to take the time and effort to analyze the business rule decision point to ultimately come to the same conclusion.

For additional guidance and policy requirements, see MIL-STD-3031.

6 Contracting/Acquisition

As with all technical data acquisition efforts, S1000D acquisitions are required to adhere to the policy defined by AMC PAM 25-32, Guide for Preparation of Equipment Publications Contract Packages. That document should serve as the primary source regarding guidance and procedures for the contractual application of requirements for the acquisition of technical manuals. Other documents that should be consulted for additional instructions include AMC-R 25-76 and DOD 5010.12-M.

The following section provides S1000D-specific guidance that supplements AMC PAM 25-32 and these other documents. The guidance will assist the project to prepare statement of work, Contract Data Requirements List (CDRL) and exhibits pertaining to technical publications acquisition and reflecting the requirements of S1000D.

For S1000D technical publications, the TMCP package will need the following S1000D-specific components.

For additional guidance and policy requirements, see AMC PAM 25-32 and DOD 5010.12-M.

6.1 Prepare CLINs

DOD 5010.12-M requires that a separate Contract Line Item Number (CLIN) be prepared in the contract for the acquisition of technical manuals. This applies to S1000D acquisition as well. Using a separate CLIN for technical data allows the project to accurately determine and monitor costs related to technical data acquisition. The CLIN for TMs should identify each publication type required to plan, maintain, operate, and support the product in question, as well as consideration for changes to each. This information should match the publication types selected by the project from MIL-STD-3031, Appendix A.

For additional guidance and policy requirements, see AMC PAM 25-32.

6.2 Prepare SOW

The SOW describes the work the contractor is required to perform. It also describes any Government responsibilities (such as providing source material and Government-furnished equipment).

For additional guidance and policy requirements, see AMC PAM 25-32.

6.3 Prepare document summary list

The Document Summary List (DSL) is where a project will list all the specifications, standards, handbooks, commercial standards, project business rule DID, etc., directly cited in the solicitation, contract, or contract modification. The DSL may also contain instructions and/or definitions pertaining to the CDRL.

For additional guidance and policy requirements, see AMC PAM 25-32.

6.4 Prepare contract exhibits

A contract exhibit is any document, referred to in a contract that establishes requirements for deliverables. The term is not to be used to refer to any other kind of attachment to a contract. The DD Form 1423 (CDRL) is always an exhibit, rather than an attachment. For an S1000D deliverable, this includes the following:

- Content Selection Matrix. These matrices (from MIL-STD-3031 Appendix A) define the specific content within each publication type that must be delivered.
- Standard Numbering System (SNS) codes. The SNS defines (in a standard code) the physical (or functional) breakdown of the equipment.

- Draft DMRL. The draft DMRL identifies the specific data modules that must be delivered. It is developed by extending the content selection matrix by incorporating all the considerations of the physical breakdown of the equipment.
- Functionality Matrix. The functionality matrix defines the required capabilities of the delivered IETP. This is not required for page-oriented publication acquisitions.
- Project Business Rules DID (DI-TMSS-81784). This DID documents all the project decisions that complete the tailoring of S1000D. It includes the table found in MIL-STD-3031 Appendix D.
- Information Codes. The project should provide a list of the information codes, variants, and information names that are allowed for use in the project data modules. This list should be extracted from the content selection matrices and be a subset of the list found in Appendix B of MIL-STD-3031.

For additional guidance and policy requirements, see AMC PAM 25-32.

6.5 Contract clauses

Contract clauses are terms or conditions necessary to ensure the Government receives the intended deliverables. For all S1000D contracts, this includes a clause stating that the Government has ownership rights to all of the data (including any data required to generate the publication). The ownership rights should include the authority to modify, reproduce, perform, display, release, or disclose technical data.

For additional guidance and policy requirements, see AMC PAM 25-32.

6.6 Prepare CDRL (DD Form 1423)

DD Form 1423 (CDRL) should be completed and included in the TMCP. DD Form 1423 is the standard format for identifying all data requirements in a solicitation and deliverable data requirements. This form is used to list each required manual, the specification necessary to prepare each manual, and other critical contract information such as the delivery schedule of each deliverable item. Instructions for completing the CDRL can be found with the form.

For additional guidance and policy requirements, see AMC PAM 25-32 and DOD 5010.12-M.

7 Post-Contracting Project Business Rules

The project business rules document is typically an incomplete document at the time of contract solicitation. A sub-set of the project decisions can only be made in collaboration with the vendor. And of course, the vendor is not identified until after solicitation award.

After contract award, the contractor and the Government need to collaborate to determine a complete set of business rules for the project by making decisions on every item in the list. The results are formally documented in the project business rules matrix.

Project business rules should be completed before the authoring of technical publications begins. Although, it is expected that the business rules may change over time as lessons are learned and requirements are adjusted. The listing of rules should be kept current whenever further project decisions are changed.

It is important that all stakeholders are fully involved in and informed about the most current version of the business rules. It is also important that the BREX file be maintained so it is in sync with the business rules (see 8.3).

7.1 Determine all remaining project BRs

The project team (both the Government and the selected vendor) need to work together to ensure that every project decision point has an identified decision. It is important, for example, to prohibit the use of unneeded elements and attributes so that an element is not erroneously used for an unintended purpose during authoring.

A number of post-contract award business rules will be dictated by the vendor's authoring environment, and by the viewer and content management and CSDB tools that have been selected.

All business rules should be documented in the matrix provided in MIL-STD-3031 Appendix C. Any business that require narrative explanation beyond a sentence or two should be described in detail in a document separate from the matrix.

For additional guidance and policy requirements, see MIL-STD-3031.

7.2 Coordinate project BRs with LOGSA

All project business rules need to be coordinated with LOGSA. This is a requirement in MIL-STD-3031. It is important that LOGSA be informed about the experiences of individual projects so that lessons learned and common requirements can be incorporated in future releases of MIL-STD-3031. More complete Army business rules will result in less effort when developing future project business rules.

LOGSA is particularly interested in several specific subject areas in the business rules. These areas typically involve new technologies or new capabilities of S1000D. Each of the following is specifically identified in MIL-STD-3031 for coordination with LOGSA:

- Use of the S1000D wiring schema. It is expected that most projects will not use the S1000D wiring schema (in lieu of the descriptive schema or a viewer-specific solution). However, if projects desire to use the wiring schema, it is important that LOGSA develop associated business rules. Currently, Army-level business rules are not available for the wiring schema.
- Use of the S1000D applicability model. The applicability model in S1000D Issue 4.0 has acknowledged shortcomings and the S1000D Steering Committee is sponsoring improvements for future issues. If a program desires to use the applicability model, it is important that LOGSA be aware to work with the project to ensure the best chances for compatibility with the future model.

- Use of the learning data modules. Because the learning data modules are a new addition to S1000D Issue 4.0, no real world experience exists to draw from to develop Army business rules. LOGSA desires to learn from the experiences of any program implementing the learning data modules so that experience can be shared across the Army (via updated Army business rules).
- New ICs, ICVs and information names. MIL-STD-3031 Appendix B provides a comprehensive list of information codes, variants, and names that satisfy the content requirements for all the Army's traditional content requirements. LOGSA acknowledges, however, that equipment, uses, and circumstances will change and that there will be valid justifications for expanding the list in Appendix B. It is a requirement that all Army programs coordinate all needed information codes, variants, and information names that are not in the list with LOGSA. LOGSA will review each request and determine the best course of action, which will likely be one of the following:
    - Submit a Change Proposal Form (CPF) to have new information codes added to S1000D (and by extension to MIL-STD-3031, Appendix B).
    - Add an information code variant and/or information name to MIL-STD-3031 Appendix B. New and corresponding content requirements will also be added to the content requirements portion of the standard as well.
    - Advise the requesting project that an existing information code that will satisfy their requirement.

For additional guidance and policy requirements, see MIL-STD-3031.

8 Develop Technical Data

The most obvious technical data implementation phase is when the technical data is actually developed. This phase will likely consume the most resources and have the longest duration of any other phase. This phase will also not end when the next phase (post-development phase) begins as technical data will be continually updated and changed as the equipment and procedures are modified based on real world feedback and other sources.

This phase covers direct planning for, and actual development of, all data assets (data modules, graphics, multimedia objects, publication modules, etc.).

8.1 Develop document management plan

S1000D is designed for the production, management, publishing, and delivery of technical data using data modules and publication modules. The exact processes used to produce technical publications will vary somewhat from project to project (understanding that the key tasks will be similar).

Projects need documented processes that will be used to manage the flow of work and data development so that efficiencies can be monitored and improvements made as they are identified. The documented workflow should include the tasks required to enable the flow of data from its source (as engineering or legacy data) through authoring or conversion to publishing and delivery. The tasks associated with post production (e.g., authoring and delivering changes) should also be documented.

Version control is an important part of document management. It is important to have rigid business rules (and the proper tools) that can provide structure to the process.

The TMCP should include a contractor requirement to produce and maintain a document management plan that details the workflow for production and maintenance of the data. This document management plan may be included as part of the project business rules or in a separate document referenced by the business rules.

8.2 Gather source data

Although the vendor will be responsible for developing the technical data in S1000D, it will often be the Government's responsibility to deliver source materials as Government-furnished information (GFI). The GFI materials may be engineering data, legacy publication source data, data modules from a related project that will be reused, graphics and multimedia files, the selected viewer, etc. Consideration should be made to allocate proper resources to gather and deliver the GFI data so as not to impact the project schedule.

8.3 Prepare BREX

Chapter 4.10, Issue 4.0 of S1000D provides a mechanism for BREX, which is a means of unambiguously communicating the business rules related to a particular set of data that has been developed and agreed on within a project or organization. Every data module must refer to a BREX data module that provides the rules that govern the production of the data module and any changes made to it.

In an ideal situation, the project BREX file should be completed before the start of data authoring. The project BREX should be developed in parallel to the development of the rules that dictate the content of the BREX. It should be understood, however, that the business rules themselves, as well as the corresponding BREX file, will need to be updated as requirements and circumstances change.

It is also important to keep in mind that the project BREX file is only one of several BREX files that will contain business rules that will be enforced upon the project's data. The S1000D requirements are codified in the mandatory S1000D BREX, and the Joint Service and Army business rules are codified in the mandatory Army BREX. In some cases, there may also be a major command or other organizational BREX that is applicable to the project data.

The BREX files will accomplish two important tasks for the project. First, the BREX files can be used by authoring tools to ensure that only project-allowed elements, attributes, and values are used and used in the way intended. Secondly, the BREX files can be used by the Government during verification to help determine that the data is in compliance with the business rules.

For additional guidance and policy requirements, see S1000D and MIL-STD-3031.

8.4 Create formal DMRL

The DMRL is used to identify the required data modules for a project. The DMRL supports planning, reporting, production, and configuration control, especially in a shared-work environment. A DMRL can be generated in sections (e.g., by partner companies for later merging) or in a complete form.

The first DMRL should be initially generated as an output of the content selection/information set identification process. Completed content selection matrices describe the content breadth that is required for a project, but do not indicate depth, quantity, and other details that are required in the DMRL. For example, the content selection matrix provides a means for indicating that the project requires a maintenance publication (or maintenance content in an IETP), and it describes the breadth of the maintenance content (i.e., the procedures and content that are required within the maintenance publication). But it does not describe the number of data modules required to deliver that content, so it can apply to all components of the product and for all configurations of the product.

More specifically, the content selection matrix will indicate that lubrication procedures are required as part of maintenance procedures and (together with the information set business rules) will describe the depth that is required within the lubrication instructions. However, it does not indicate the specific components to which those lubrication instructions apply. On even moderately complex equipment, it is likely that numerous different lubrication procedures will apply to numerous different assemblies. Each of these will probably require a separate data module. Figure 6 illustrates this concept.

The DMRL is the instrument used to define the quantity as well as types of data modules required by the project. The content selection matrix will indicate that lubrication procedures are required, and that those procedures will be provided in procedural data modules using a specified information code and information name. The DMRL will indicate each instance of a lubrication procedure data module that will be produced.

It is at this point in the process that projects can begin to identify where they will be able to reuse data modules. The same procedure (information code), with the same `modelIdentCode` and the same SNS number, should use the same data module even if it is used in different contexts or manuals.

The DMRL also provides additional details about the required data module. These details include the data module code, data module status, data module title (tech name + info code), issue number, issue date, and more. The CSDB Status List (CSL), which is based on the formal DMRL, is used to document and track a complete picture of the project's data modules as they are being developed.

The DMRL is initially developed at the earliest stages of the project (see 4.6) and it is continually updated as project planning progresses. The DMRL is considered "formal" when the Government and vendor are satisfied that it accurately describes all data modules known to be required by the project to satisfy content requirements. The formal DMRL becomes a part of the contract documents and the data modules listed in the DMRL become required deliverables for the vendor. The formal DMRL can be modified, but only as a result of an agreed-on change in contract scope. Adding or removing data modules from the formal DMRL requires the concurrence of both the Government and the vendor.

For additional guidance and policy requirements, see S1000D and MIL-STD-3031.

8.5 Development and implementation of QA plan

The technical data vendor is responsible for developing and implementing the QA Plan just as they would be if a data standard other than S1000D was selected for the contract. The contractor should deliver that plan before or very near the start of data authoring. The plan should take into account the benefits of S1000D that can make the results of a QA plan more effective. This includes concepts such as BREX (to automate the validation of business rules compliance) and data modularity (reused data modules only require one validation and verification regardless of how many times they are used).

8.6 Create initial CSL

The CSL is a document used to track the vendor's progress in authoring the required data modules. The CSL, which contains a list of all required data modules and associated metadata (derived from the formal DMRL – see Figure 6), is used to communicate production status. The vendor updates the CSL to report progress to the Government. An updated CSL should contain a notation of status for each required data module (e.g., "inwork," "delivered") and it should be provided to the Government with each deliverable package (at a minimum). In addition, the project may elect to have an updated CSL delivered at regular intervals (e.g., weekly or monthly).

For additional guidance and policy requirements, see S1000D and MIL-STD-3031.

8.7 Develop data / Create CSDB

S1000D uses a conceptual database called a CSDB to store and manage source content. The CSDB includes data modules, publication modules (PMs), and all associated non-SGML/XML objects (such as graphic files). The CSDB also includes notes to accompany delivery of data (Data Dispatch Notes (DDNs)) and management lists that are used to report requirements (DMRL) and status of data modules (CSL). The CSDB can take many different forms, from a simple Windows file system to a content management application tailored to S1000D data types and processes.

Many different tools exist that can author S1000D-compliant data. Authoring software is available as COTS products that rely on built-in parsers to ensure that the data conforms to the S1000D schemas. The authoring software should have the ability to view graphics (both vector and bitmap) and tabular data for ease of review.

It is at this phase of the project that the actual technical data is produced. The vendor should be responsible for reusing existing data that has been gathered (see 8.2), developing new data modules, and developing new graphics and multimedia files. The authored data modules (and other CSDB objects) must comply with S1000D and the project business rules (see 5 and 7), must satisfy the project's content requirements (see 4.4.2), and must deliver the required functionality (see 4.7).

For IETPs, the project must acquire the appropriate style sheets and formatting scripts to facilitate this use. Data must not be proprietary and must be separate from software. Use of the process data module will require a logic engine to work in conjunction with the viewer. The logic engine must follow the guidelines spelled out in S1000D and comply with Army infrastructure requirements.

Published S1000D data can be as simple as HTML files for viewing in a standard browser or PDF files for printing or desktop display. However, a robust viewing system can view published data modules and provide interactivity between the system and the user. This is particularly useful for troubleshooting and fault isolation. The level of functionality required by the project will further help determine functionality requirements for a viewing system (see 4.7). Alternatively, the functionality of an existing viewing system can limit the level of functionality for a project.

For additional guidance and policy requirements, see S1000D and MIL-STD-3031.

9 Post-Development Tasks

Depending on requirements, there may be one or many deliverables from this section. As stated previously, all authored source data, including publications modules and data modules, resides in a single repository called the CSDB. Translation must occur for the publication to progress to the next step. Depending on project requirements and publication tools used, XLink attributes and Resource Description Framework/Dublin Core (RDF/DC) metadata may be automatically added to the document. Next, the publications must be rendered in a viewable format. Formatting scripts are applied to the transition files (from the translation step) to produce files ready for display or printing.

Only the source data files, the pre-publication files (neutral repository), the viewable files, or a combination of any of the three types may be specified as deliverables. The type(s) of file selected as deliverables will determine which other items from this process may be specified as deliverables as well. The acquisition professional should become familiar with the technical details of this process or should have a technical point of contact available, when considering which of the deliverables detailed in the following paragraphs should be required.

Because the contract requires delivery of the source data, the next question that must be asked is whether the contractor is required to render the data in a viewable format, either for delivery or as part of a quality control process. If the contractor is required to render the data or deliver the neutral repository, then translation and formatting scripts become necessary. The scripts may be GFI, developed by the contractor under this task, or developed by the contractor as proprietary software that is used for the Government's benefit. Any Government-furnished item should be listed in the GFE/GFI section of the TMCP. If scripts are to be developed under this task, they should be listed in the deliverables section.

If the translation files are deliverables, then instructions for running the script and accessing translated files must also be included. Translated files should reside in a file storage system but could reside on a Web server, database, or other virtual representation. This requirement must be made clear in the translation instructions, and the infrastructure must be able to support this interim process. If a preference for an interim file structure exists, this must also be specified in the contract requirements.

The next step in the process is rendering the publication in a viewable format. This step could use XML scripts such as eXtensible Stylesheet Language Transformation (XSLT) and eXtensible Stylesheet Language Formatting Objects (XSL-FO) to apply output styles. Since current browsers are not able to resolve Universal Resource Names (URNs) and XLinks automatically, the transformation must include resolution for URNs and XLinks. URNs are resolved to Uniform Resource Locators (URLs) and XLinks are translated to the required HTML hyperlink form. If the viewer can interpret XSL stylesheets and process native XLink attributes directly, then the transformation from XML to HTML is not necessary.

These scripts may be developed by the Government and provided to the contractor for QA purposes. If they are furnished by the Government, they should be listed in the GFE/GFI section of the TMCP. Script deliverables will not be required. If the contract requires development of the scripts as part of the task, then the deliverable must include the appropriate formatting files. The scripts may also be proprietary contractor files used for the benefit of the Government, in which case no deliverable is required.

9.1 Distribution of Preliminary Technical Manuals

The project is responsible for distributing all preliminary publications for review and comment. For example, all new and revised publications will be reviewed by the applicable operational testers and evaluators plus representative Army elements as agreed to by Army Materiel Command (AMC) and TRADOC. Other review requirements exist for specific manual types and circumstances.

For additional guidance and policy requirements, see AMC-R 25-76.

9.2 Validation

Validation is a preparing activity QA responsibility that shall be accomplished for all publications, changes, and revisions. Validation, called first verification under S1000D, provides a measure of the overall quality of the manual. The validation should be performed by individuals who are of approximately the same education, experience, and skill level as the actual target audience for the publication. Where it is not possible to obtain such personnel for validation, validation personnel should at least include those who can be expected to provide a realistic test of the validity of the publication (e.g., do not use graduate engineers or those involved in authoring the publication). The Government reserves the right to witness the validation. The preparing activity shall notify the Government of the validation schedule before commencement. A publication is not considered validated until the following conditions have been met:

- The project's engineering technical review has been completed.
- Information reflects configuration of the systems and equipment.
- Procedural instructions are readily understandable by the intended user and adequate to perform all intended functions.
- Adequacy of data is checked to ensure that it supports the approved maintenance and support plan.
- Hardware of the proper configuration is available for the validation effort. An operational environment should be used, if possible, or simulated, if practicable.
- IETP functionality is in accordance with the specified requirements.
- All descriptive, operation, maintenance, troubleshooting, and parts information can be easily accessed from the IETP Table of Contents and the navigation and logical sequencing through the information is manageable and user friendly.
- All technical information, including text, tables, and graphics appear in the appropriate data panes of the IETP.
- Source files are tagged to the level and depth required by the applicable schema and the technical content requirements contained in S1000D and MIL-STD-3031.
- The CSDB has been validated to ensure it contains all required contents.
- Information codes and information sets are validated against requirements
- The IETP system and any automated IETP compilation processes have been validated.
- XML files are validated against applicable schema.

For additional guidance and policy requirements, see AMC-R 25-76 and AR 25-30.

9.3 Submission of draft manuals to LOGSA and APD

As with IETPs prepared in accordance with other standards, a draft of the S1000D IETP and a copy of the verification plan should be submitted to LOGSA for review and filing.

For additional guidance and policy requirements, see AMC-R 25-76, AMC-P 25-31 and AR 25-30.

9.4 Verification

Before Department of the Army authentication, all technical publications require verification performed with production configuration equipment. Verification, which is termed second verification under S1000D, is the process of reviewing, inspecting, testing, checking, measuring, auditing, or otherwise establishing and documenting that products, processes, or documents conform to the requirements of S1000D, MIL-STD-3031, and other applicable standards, specifications, policies, and requirements.

The project should prepare and coordinate a verification plan with user representatives to ensure that the equipment publication is tested and proven suitable for use by the target audience for the intended purpose.

The Government will verify usability and accuracy of the technical publications using production configuration equipment to the greatest extent possible. Verification will be accomplished by one or a combination of the following methods, as set forth in a verification plan that must be agreed to by TRADOC and LOGSA:

- Hands-on verification by user representative (preferred method).
- Combined contractor publication validation and Government publication verification.
- Verification by desktop review.

The project should invite LOGSA to participate in the coordination of verification reviews.

For additional guidance and policy requirements, see AMC-R 25-76, AMC-P 25-31 and AR 25-30.

9.5 Authentication and distribution of manuals

The final steps in the S1000D development process are authentication, production of the publications, and distribution.

The Secretary of the Army (SA) and Administrative Assistant to the Secretary of the Army (AASA) are the authenticators of all Army publications. Authentication by the SA or AASA constitutes clearance of the publication's content and verifies that appropriate coordination has been accomplished (including legal reviews). The project should allow 100 days for the authentication review cycle.

Decisions made in the previous steps may affect the deliverables in this step. If the viewable data or rendered publications are considered to be a contract deliverable, an important item to consider is runtime style sheets. The Government may choose to furnish viewer style sheets such as Cascading Style Sheets (CSSs), in which case they should be listed as GFE/GFI. If viewer style sheets are not provided by the Government, they will be required as a task deliverable, and should be listed in the contract accordingly.

Final reproducible copy (FRC) should be prepared during the production, fielding/deployment, and operational support phase of the equipment life cycle. FRC is the final manuscript, reproducible copy, or electronic media delivery, with all necessary changes and corrections incorporated and including final resolution of all comments and recommendations made as a result of validation, verification, testing, and user review. If errors are found in the FRC, it will be considered a preliminary technical manual until the errors are corrected. After review and approval, the FRC is submitted for distribution.

Print-on-demand requirements will require a PDF file to be delivered on CD-ROM to the Defense Automated Printing Service (DAPS) for inclusion in the Technical Manual Publish-on-Demand System (TMPODS). The viewable data should be delivered on DVD or CD-ROM to facilitate loading to a server and viewing in a standalone mode.

Technical data may be distributed to users in a number of ways that are already defined and should be determined in accordance with the project-specific functionality matrix that is in Appendix D of MIL-STD-3031.

For additional guidance and policy requirements, see AR 25-30.

9.6 Sustainment

The project should develop and document a data sustainment plan. The plan should include maintenance of the data, essentiality and currency reviews, distribution, and demilitarization/decommission. Sustainment strategies should evolve and be refined throughout the life cycle to support overall acquisition strategies, particularly during development of subsequent increments and modifications to the equipment.

The project's maintenance strategy should include provisions for receiving and responding to feedback from the user community (DA Form 2026), receiving and responding to engineering changes, and responding to requirements changes.

The project's essentiality and currency review strategy should be designed to ensure that the data (and tools provided continues to be the correct tools to satisfy requirements (even as requirements change).

The project's distribution strategy needs to address the current state of data distribution as well as plan for taking advantage of future technology improvements that can increase distribution speed and/or reduce costs.

The project's demilitarization/decommission strategy must define technical data requirements associated with end-of-life cycle needs. This may include developing new technical data associated with demilitarization, decommission, or destruction procedures.

The plan should consider implications for who will initially, and in the future, will maintain the data. The data could be maintained by the originating vendor, a new vendor, the Government, or a combination. It is critical that the Government own the necessary data rights to the data, graphics, style sheets, and associated software to allow for the greatest flexibility when determining data maintenance strategies.

10 Summary

S1000D data acquisition processes are much like those associated with legacy data acquisition. LOGSA has provided this document as a guide to ease the transition to S1000D data for acquisition professionals. Your feedback is appreciated (URL or e-mail).