Previous Section

3.0 -- Infrastructure Requirements for Processing Digital Data

3.1 -- Introduction

The Program Manager needs to determine what digital data functions are required and who is the data user. The infrastructure may vary for each use of the data, if the hardware, software, and network cost are to be minimized. Generally, certain data functions are performed with a specific format. Conversion software may need to be procured to ensure that the format of the data is also compatible with the end user's requirements. The user functions are divided in the following areas.

- **View:** Acceptance, verification, and review of acquired digital data sets.
- **Comment/Annotate:** Annotate or highlight for future reference, or make annotations and comments without the ability to change the original file. The annotations are associated with a specific item or location within a document.
- **Update/Maintain:** Update and modification of digital data.
- **Process/Transform:** Categorize, extract, cross-reference, and modify the format, composition, and structure of the data into another usable form.
- **Archive:** Storage of the accepted data into a repository, managed by a central index or locator.

The following section contains information to aid the Program Manager in determining the infrastructure needed to process digital data. Digital data includes the TMs/TOs and the TDPs. TMs/TOs are any technical publication or other form of documentation used to install, operate, maintain, test, repair, and overhaul equipment or to provide logistic support for ships, aircraft, defense systems, or defense materiel. The TDP contains the information necessary to describe a defense system and its components in terms of design, engineering, manufacturing, and logistic support.

The current user infrastructure, as well as any applicable Department of Defense (DoD) and Service-specific modernization programs, must be considered in any decision to procure new computer equipment or software.

3.2 -- Infrastructure Modernization Programs for Digital Data

Both DoD and the Services have implemented several infrastructure modernization programs, which have resulted in the development of a wide variety of Automated Information Systems (AISs). AISs for digital data are designed to be implemented at the support activity and are typically funded through the DBOF. Due to the cost of the equipment and software required for AISs, these systems are often made available to the Program Manager as a shared resource. The Program Manager should be familiar with the systems available and the system requirements needed to facilitate compatibility between the software support activity and the local Program Manager's digital data infrastructure. The following paragraph provides an overview of DoD AISs.

3.2.1 -- DoD Automated Information Systems

DoD has developed three primary AISs that are intended for implementation throughout the Service organizations:

- **Configuration Management Information System (CMIS):** The CMIS is a DoD program software tool designed for users to accomplish configuration identification, configuration change control, configuration reporting, configuration audits, and configuration status accounting for a weapon system program. CMIS supports the life-cycle baseline management for both engineering documentation and hardware. It tracks multiple baselines and establishes a functional baseline based on Hierarchical Structure Code by class and tracks documents and part number information. Engineering documents, part numbers, and technical manuals/technical orders are cross referenced and accessed by the user from a single workstation.

- **Joint Computer-aided Acquisition and Logistic Support (JCALS):** The JCALS program is the DoD initiative to modernize the infrastructure to enhance our capability to create, manage, use, transfer, and store technical information required for weapons system acquisition, design, manufacture, and support. JCALS will provide the connectivity between databases and activities to allow a sharing of data and processes. JCALS is intended to interface with many Service-specific AISs as well as being the primary interface between JEDMICS and CMIS.

- **Joint Engineering Data Management Information and Control System (JEDMICS):** JEDMICS is the joint services "digital warehouse" for engineering drawings and related technical data. It will accept drawings and related data in standard digital form or will digitize drawings and data from hard copy. The system indexes, stores, and retrieves the data digitally and can distribute it in several ways including paper, disk, and CD-ROM.

These DoD systems are subsuming many existing AISs, and interfacing with several other Service-specific legacy systems. The Service-specific appendices, **Air Force**, **Army**, and **Naval Forces**, include overviews of that Service's primary AISs.

3.2.1.1 -- JCALS/JEDMICS/CMIS Integration

To validate the use of a single interface for accessing configuration indices, conducting global searches, and gaining timely access to geographically dispersed engineering data, CMIS and JEDMICS are being integrated with JCALS. Results to date are extremely encouraging, with major productivity gains projected for maintenance and supply support. Figure 3-2 depicts the JCALS/JEDMICS/CMIS integration.

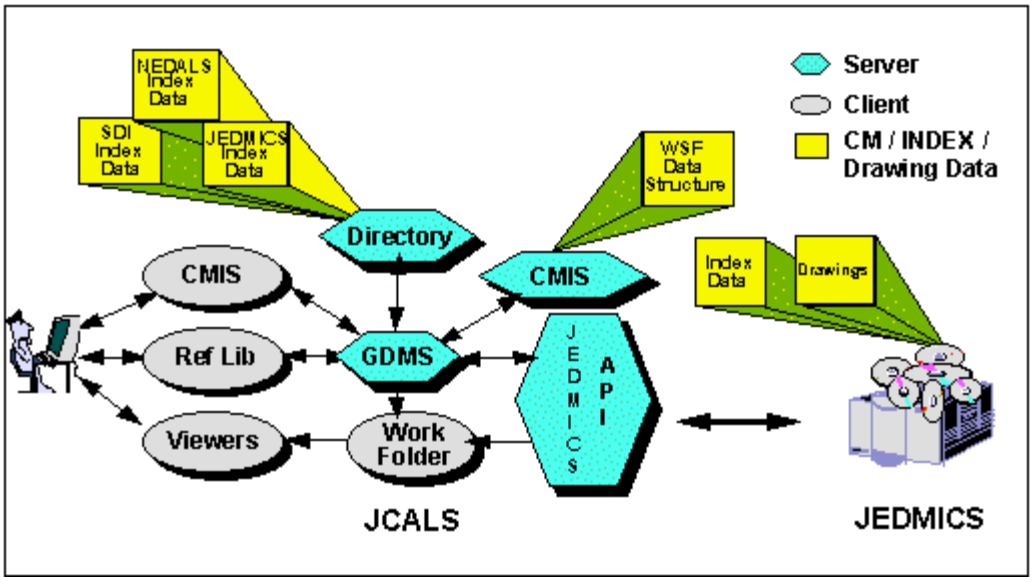

Figure 3-2 -- JCALS/JEDMICS/CMIS Integration.

3.3 -- Hardware Requirements for Processing Digital Data

3.3.1 -- Hardware Requirements for Processing TMs/TOs

The hardware requirements for processing TMs/TOs are dependent on the specific requirements of the user. Table 3-4 displays the specific hardware requirements for processing digital data. In general, no special hardware is required for TM/TO processing; standard workstations should be adequate for most processing tasks. A CD-ROM drive may be required if the TMs/TOs is stored on a CD-ROM (a network CD drive may be sufficient). A large monitor (17"-19") may be desirable if the TMs/TOs contain large drawings and illustrations. If TMs/TOs are being created or modified, a scanner may be required to convert paper or aperture card data into digital format for incorporation into the TM/TO. Specific hardware requirements should be addressed on a case-by-case basis depending on the type and amount of data being processed.

	Process Technical Manuals					Process Technical Data Packages				
	A	V	C	U	E	A	V	C	U	E
Hardware										
Pentium 133	X	X	X	X	X		X	X		
RISC Workstation				X		X			X	X
RAM	16Mb	16Mb	16Mb	32Mb	32Mb	32Mb	32Mb	32Mb	32Mb	32Mb
Hard Drive	1 Gb	1 Gb	1 Gb	1 Gb	1 Gb	1 Gb	1 Gb	1 Gb	1 Gb	1 Gb
Monitor	15-17"	15-17"	17-19"	17-19"	17-19"	19-21"	19-21"	19-21"	19-21"	19-21"
Video Card	2Mb	2Mb	2Mb	2Mb	2Mb	2Mb	2Mb	2Mb	2Mb	2Mb
Scanner	X			X	X	X			X	X
CD-ROM Drive	X	X	X	X	X	X	X	X	X	X
WORM Drive	X			X	X	X			X	X
Tape Drive	X		X	X	X	X	X	X	X	X
Software										
Word Processor	X	X	X	X	X	X	X	X	X	X

Viewers (SGML, PDL)		X	X				X	X		
Database	X			X	X	X		X	X	X
Spreadsheet					X	X			X	X
Raster Graphics	X	X	X	X	X	X	X	X	X	X
Vector Graphics	X		X	X	X	X	X	X	X	X
Other										
Networks	X	X	X	X	X	X	X	X	X	X
Printers	X	X	X	X	X	X	X	X	X	X
Plotters						X		X	X	X

*A = Archive, V = View, C = Comment/Annotate, U = Update/Maintain, E = Extract/Process/Transform

Table 3-4. -- Matrix of Recommended Infrastructure Requirements.

3.3.2 -- Hardware Requirements for Processing TDPs

Technical Data Packages typically consist of some type of drawings and associated lists, specifications, and/or documentation. The primary factor influencing the hardware requirements is what users will do with the data. Regardless of the data format (native CAD or raster), the hardware will be basically the same for users that will only view and possibly comment on the data; a standard TDP workstation (PC-based) should be adequate (see table 3-4). Since raster format is not processable, users that will update or extract the data, or use the data for modeling and simulations, will probably need some additional hardware capabilities.

The hardware requirements differ depending on the engineering disciplines being processed. There are some basic commercial IGES drawing packages that can produce 3-D models on an 80486, 68CL040, Pentium (P5), or PPC601 computer. If the Program Manager plans to simulate the stresses of a mechanical part or the multilayer printed circuit board (PCB) layout, a RISC-based workstation should be considered. In addition to the basic workstation, the Program Manager may need to consider procurement of the following equipment:

- 19"-21" Monitor
- Database Server (required for large, drawing databases)
- MIL-STD-1840 tape drive (standard for large, data delivery)
- Other media drives, including DAT, cartridge tape, and QIC (provide large storage capacity)
- PostScript printer (required for A size drawing and documentation)
- A to D size electrostatic plotter (large volume of drawings or for raster drawings)
- A to D size pen plotter (low volume vector drawings)
- Scanner (page, large format, or aperture card)

3.4 -- Software Requirements for Processing Digital Data

The software requirements for processing digital data will be dependent on the data format and usage requirements. Each format and usage options will carry with them specific software needs and operating system requirements. The Program Manager should procure systems that are compatible with not only end user requirements, but also with both known and possible future digital data sources.

3.4.1 -- Software Requirements for Processing TMs/TOs

Once the program logistics support agent has determined the need for a TM/TO and the TM/TO manager agent has completed the Technical Manuals Contract Requirements (TMCR), the typical TM/TO creation process consists of authoring, reviewing, updating, and inspecting the technical manual or publication. Each program can accomplish these tasks by various methods.

The first decision the Program Manager must make is whether or not the TM/TO will be an IETM. IETMs can fall into any one of five classes ranging from basic, indexed page viewing files to highly integrated IETM databases (see para.3.4.1.1). Because of the wide range of capability across the classes, almost every TM/TO being created today can be easily developed at least as a Class 1 IETM. This decision, along with the data use and the data format, will determine the specific infrastructure required for the creation, management, and use of a TM/TO.

3.4.1.1 -- General Software Requirements for Creating TMs/TOs

The preliminary TM/TO may be authored in a variety of software programs. Commercial word processing software, desktop publishing software, or an SGML editor all have ability to author technical documents with imbedded tables and figures. TM/TO reviewers can review the document in its native format, requiring that they possess the same authoring software as that used by the developers, or the file can be converted to a neutral file for which they must have a viewer. SGML and Portable Document Format (PDF) are two examples of neutral file formats that require only a viewer in order to be viewed by data users. Once the preliminary version is complete, commercial software is available to convert a word processing or desktop publishing document into a MIL-PRF-28001 SGML format file, if desired. If SGML is not the desired final format, TMs/TOs can remain in their native format, or be converted to PDL or neutral file format such as PDF.

SGML is recommended for TM/TO development because of its portability across platforms and flexibility in data integration. Low-cost SGML document editors are available for PCs and UNIX workstations. PDL viewers and annotator translators can be purchased to convert the entire SGML file into raster format, word processing file formats, and desktop publishing file formats.

3.4.1.2 -- Software Requirements for Creating IETMs

As defined in the IETM Specifications (MIL-M-87268, MIL-D-87269), an IETM is a package of information required for the diagnosis of a weapons system. It is a Technical Manual in digital form that possesses the following characteristics:

- It's prepared with an automated authoring system which is the system that links all the pertinent information;
- It's designed for electronic-window display;
- It's designed for a portable electronic display such as a desktop or laptop PC or other portable electronic display device;
- The elements of technical data are interrelated, meaning that the user is able to access the information through a variety of paths; and

- It can function interactively in providing supplemental information such as procedural guidance, navigational directions, and assistance in logistic-support functions supplemental to maintenance.

There are 5 classes of IETMs ranging from the elementary electronically indexed page images to an interactive electronic information system built around an integrated database. An extensive discussion of IETMs is provided in Section 9 of this Desktop Guide. The 5 classes of IETMs are described in Table 3-5 in terms of display, data format, and functionality.

IETM Class	Display	Data Format	Functionality
1	• Full page viewing • Page-turner/Next function • Intelligent index for user access to page images • Page integrity preserved	• BitMap (raster) • Indexing and header files (Navy Mil 29532) • MIL-PRF-28001 or Postscript pages • Generic COTS imaging system formats (e.g., Portable Document Format [PDF])	• Access pages by intelligent index/header info • View page with pan, zoom, etc., tools • Limited use of hot-spots • Useful for library or reference use
2	• Primary view is scrolling text window • Hot-spot access (Hyper-links) to other text or graphics • User selection and navigation aids (key-word search, on-line indices) • Minimal text-formatting for display • User selectable call to (launch) another process	• Text -- ASCII • Graphics -- whatever viewer support-e.g., BMP or CALS • Can be SGML tagged -- no page breaks (browser) • Access/index often COTS dependent with Hypertext browser • Generic: COTS with Hypertext browser	• Browse through scrolling info • User selection of graphics or hot-spot reference to more text • Hot-spot and cross-reference usually added after original authoring
IETM Class	**Display**	**Data Format**	**Functionality**
3	• View smaller logical block of text -- less use of scrolling • Interaction through dialog boxes • Interaction per MIL-M-87268 to extent possible • Text and graphic simultaneously displayed in separate window	• Linear ASCII with SGML tags • SGML with content vice format tags • Maximum use of MIL-D-87269 • Generic: SGML tags equivalent to MIL-D-87269	• Dialog-driven interaction • Logical display of data in accordance with content • Logical **Next** and **Back** functions • User-selectable cross-refs and indices • Content specific help available
4	• View smaller logical block of text -- very limited use of scrolling	• Fully attributed database elements (MIL-D-87269) • MIL-D-87269 content	• Dialog-driven interaction • Logical display of data in accordance with content

	• Interaction through dialog boxes with user prompts • Interaction per MIL-M-87268 • Text and graphics simultaneously displayed in separate window when keyed together	tags with full conformance with Generic Level Object Outlines (architectural forms) • Authored directly to database for interactive electronic output • Data managed by a DBMS • Interactive features "authored in" vice added-on	• Logical **Next** and **Back** functions • Useful as interactive maintenance aid • User-selectable cross-refs and indices • Content specific help available
5	• Same as Class 4 for IETM function • Interactive electronic display per MIL-M-87268 • Expert system allows same display session and view system to provide simultaneous access to many differing functions	• IETM info integrated at the datalevel with other application info • Does not use separate databases for other application data. • Identical to Class 4 standards for IETM applications data • Coding for Expert Systems and AI modules when used	• Single viewing system for simultaneous access to multiple info sources • Same as Class 4 for IETM functions • Expert system to assist in **Next** functions, based on info gathered in session

Table 3-5. -- The Five Classes of IETM.

The preliminary IETM may be developed in a commercial word processing software or SGML editor. Once the preliminary version is complete, the data must be converted such that a hypertext system can retrieve the data and display the information requested. A Class 1 IETM can be achieved, for example, by simply creating the TM/TO in word processing software, converting it to PDF, and implementing a basic indexing scheme. The higher classes of IETM will require not only word processing and/or SGML software, but also database software suitable for storing blocks of text and graphical images.

3.4.1.3 -- Software Requirements for Managing TMs/TOs

Once the final reproducible copy of the TM/TO is accepted, the cognizant life-cycle maintenance activity is responsible for the configuration management of the document. To properly implement configuration management, the following software packages may be needed by the configuration manager.

- SGML editor and/or viewer
- Neutral file format viewer (e.g., PDF)
- DTD editor
- Illustrator editor for vector and raster
- Configuration management database

3.4.1.4 -- Software Requirements for Using TMs/TOs

The software requirements for using TMs/TOs are based on the format in which they are delivered and the

fact that the TM/TO will not be edited or changed by the user. Higher classes of IETM could require more software capability than that required for the lower classes. Class 1 IETMs, for example, could require only installation of a free reader/viewer software application. Depending on the format that the TM/TO was delivered in, the end user could require any part of the following software to utilize the TM/TO.

PDL or other neutral format (PDF) viewer and annotator

- SGML viewer
- SGML parser to extract data
- Database query application

3.4.2 -- Software Requirements for Processing TDPs

The first decision that affects the software requirements is whether the final engineering drawings will be stored in the native CAD files or an equivalent vector format versus raster. Because raster data is not readily processable, the processing requirement to work with raster data can be significantly less than with a processable vector format such as IGES or VHDL.

3.4.2.1 -- Software Requirements for Creating TDPs

The software requirements for creating TDPs can be in several formats. The specific format used depends on the type of data being generated and the way the data will be managed throughout its life cycle. The following formats are commonly used: raster, native CAD, IGES view, FEM (VHDL simulation), or Electronic Design Interchange Format (EDIF). The following software applications may be required for TDP creation:

- CAD
- Fluid flow analysis
- PWB layout
- SPICE simulator
- VHDL simulator
- PLD software
- Hybrid/Application Specific Integrated Circuit (ASIC) software
- Relational database

3.4.2.2 -- Software Requirements for Managing TDPs

Managing the TDP after its distribution into the field will entail all of the same software requirements needed during its creation, with an additional requirement for configuration management software.

3.4.2.3 -- Software Requirements for Using TDPs

The requirements for using TDPs are limited by the fact that users will not edit or change the content of the TDP. Therefore, only the software necessary to view and print the TDP data will be required. This will then depend on the type of TDP being used and the formats in which it was distributed. The manager will have to determine what TDP formats are likely to be encountered and develop a system appropriate to

the end users' requirements. This can include some of the following programs:

- IGES translators
- PDL or other viewers
- CAD software
- Configuration management
- Relational database

3.5 -- Telecommunications Requirements for Processing Digital Data

The telecommunications requirements for processing digital data have been briefly discussed. These requirements should be based on how data is to be shared or manipulated and what current telecommunications infrastructure is available.

Specifically, the Program Manager should determine the average number and size of data transfers to determine the type and size of the communication systems needed. Considerations are the number of modems or outside lines being supported, baud rate of the modem, error detection/correction performance, and compatibility to data sources. Will the telecommunications system be installed using standard, conditioned, trunk, or uninterruptable lines, or will fiber optics be used, if available? Once the data is coming into the facility, how and where will it be stored, and will other outside sources be allowed access? All these factors need to be given careful consideration. The initial decisions will affect the current operation and future expansion of the system.

The table below provides theoretical WAN circuit transmission time for user access requirements which will place maximum load upon a WAN circuit. This table assumes that all circuit bandwidth is dedicated to the transmission of that data item, and does not incorporate any delays due to background loads, traffic from other users, packet-by-packet/block-by-block transmission, or any other delays. The transfer rates listed are the theoretical modem/line rates followed by more realistic rates in parentheses.

Scenario	File Size	Transfer Time (sec) 56Kbps (48Kbps)	256Kbps (240Kbps)	1544Kbps (1340Kbps)
Drawing (high complexity)	9 Mb	188	38	7
Drawing (med. complexity)	6 Mb	126	25	5
LSAR (400 records)	21.2 Mb	444	88	16
LSAR (200 records)	10.6 Mb	222	44	8
Text (200 pages)	2 Mb	42	8	2

Table 3-6: -- Maximum Theoretical WAN Data Load Performance Projected Data Transfer Time.

For a single user, such transmission times appear to be adequate, however, such theoretical calculations, which do not factor in real world constraints, should not be relied upon. The transfer times identified in Table 3-6 do not address network delays related to routing paths, number of components, or congestion.

WAN traffic assumes a point-to-point connection and no congestion. Background loading due to other users, LAN/WAN overhead delays and bottlenecks, the introduction of additional users, and variations in line quality can be expected to significantly reduce transmission times. Further analysis is required, which includes all projected network traffic and contributing factors related to traffic flow to establish accurate projections for data transfer times.

4.0 -- Infrastructure Contract Vehicles

There are many options a Program Manager can invoke when acquiring digital infrastructure. Depending on the type of equipment required, the Program Manager can use existing Government umbrella contracts to acquire equipment. It is important that the Program Manager work closely with their local ADP or FIPS manager when making equipment purchase decisions. The ADP or FIPS manager is cognizant of their facility's current technology and standards. This can result in cost saving compared to commercial low bid or GSA pricing.

Information on many umbrella contracts can be found via the World Wide Web. Several contracts and addresses for more information are listed below (click an address to link to it). Note that although the contracts were issued by a specific Service, most are available to all/multiple Services.

I-CASE
Contr. #: FO1620-94-D-0002
Phone: 1-888-ICASE US
E-mail: icase@logicon.com

NASA SEWP 1
Contr. #: NAS5-32897
Phone: (301) 918-4118
Internet: http://www.sylvest.com

DESKTOP V
Contr. #: FO1620-96-D-0003
Phone: 1-888-5GET DT5
Internet: http://www.zds.com/htdocs/zds/federal/federal.htm

National Institute of Health Electronic Computer Store (NIH ECS)
Contr. #: 263-95-D-0327
Internet: http://www.nih.gov/od/oirm/nihecs.html

CSC DEIS II Contract
Internet: http://www.csc.com/about/cvr_deis.html

IDIQ Contract Information, sponsored by NCTAMS LANT:
Internet: http://www.chips.navy.mil/idiq/contract.html

Listing of Navy umbrella contracts, many of which are joint service:

Internet: http://www.nswses.navy.mil/umbrella.html

Listing of contracts for computer equipment purchases:
Internet: http://issaa-www1.army.mil

Note: Local ADP authority should be contacted for contract vehicle information.

Section 4
CALS Resources and Points-of-Contact (POC)

1.0 -- Introduction

Program Managers may need assistance in understanding and implementing Continuous Acquisition and Life-cycle Support (CALS) in order to see the benefits of applying CALS to their respective program. To fully appreciate the benefits of implementing CALS, some education and guidance on applying the CALS strategy is required. Information, training, and support resources exist today to provide assistance in CALS implementation. The Air Force Product Data Systems Modernization Program Office, the Navy CALS Resource and Implementation Cooperative (CALS RIC), and David Taylor Model Basin (DTMB), headquarters for Carderock Division Naval Surface Warfare Center (CDNSWC), are resources that can provide this assistance. The Defense Systems Management College (DSMC) can providing training in CALS, and particularly CALS in the contracting process. The U.S. Government has provided a list of Points-of-Contact (POC) that are available to the Program Manager. Also, each of the Services have provided a list of specific POCs (see appendices **Air Force**, **Army**, and **Naval Forces**). These POCs can provide assistance and information for technical and acquisition specialty areas and CALS System programs.

2.0 -- CALS Resources

U.S. Air Force Product Data Systems Modernization Program Office

Contact:	LtCol. John M. Eckerly
Phone:	(937) 257-3085
FAX:	(937) 257-5881
e-mail:	eckerlj@afcpo.wpafb.af.mil
Home Page:	http://wpaftb1.wpafb.af.mil/

Navy CALS Resource and Implementation Cooperative (CALS RIC)

Contact:	Mr. Bill Taw
Phone:	(317) 306-3035
FAX:	(317) 306-3862
e-mail:	taww@po3.nawc-ad-indy.navy.mil
Contact:	Mr. Keith Heichelbech
Phone:	(502) 364-5063
e-mail:	keith_h@smtp.nosl.sea06.navy.mil

Naval Surface Warfare Center Carderock Division

Contact:	Mr. Joseph Garner
Phone:	(301) 227-1533
FAX:	(301) 227-3343
e-mail:	garner@oasys.dt.navy.mil
Home Page:	http://navycals.dt.navy.mil/cals.html

Defense Systems Management College (DSMC)

Contact:	Mr. Stan Crognale
Phone:	(703) 805-4470
FAX:	(703) 805-3186
e-mail:	crognales@dsmc.dsm.mil
Home Page:	http://www.dsmc.dsm.mil

DSMC provides a variety of CALS Implementation Workshops such as Strategic Planning, Problem Solving, Team Building, Conflict Management, Program Planning, and Interactive Management. A workshop is initiated when there is immense difficulty in determining the most effective Plan of Action and Milestones for future implementation within an organization. Each workshop includes 10-16 participants who are senior stakeholders involved with the problem. The facilitator is a DSMC faculty member, trained in the Interactive Management process, who leads the direction of workshop activities. For more information contact:

Contact:	Ms. Florence Brueser
Phone:	(703) 805-5783
FAX:	(703) 805-3856
e-mail:	Brueserf@DSMC.DSM.MIL

Also visit the OSD CALS Home Page at: http://www.acq.osd.mil/cals

3.0 -- CALS Points-of-Contact Listing

Program Managers may obtain guidance and information regarding CALS policies, programs, and implementation by contacting the respective POC as listed below:

3.1 -- Department of Commerce

The following Department of Commerce (DOC)-National Institute of Standards Technology (NIST) POCs address CALS application/implementation in the commercial sector:

3.1.1 -- National Institute of Standards and Technology (NIST)

Federal Information Processing Standards (FIPS)

Contact:	Ms. Shirley Radack
Phone:	(301) 975-2833
FAX:	(301) 840-1357
e-mail:	shirley.radack@nist.gov

Office of Manufacturing Programs

Contact:	Dr. Merrill Hessel
Phone:	(301) 975-3986
FAX:	(301) 926-8730
e-mail:	merrill.hessel@nist.gov

STandard for the Exchange of Product (STEP) Model Data

Contact:	Ms. Mary Mitchell
Phone:	(301) 975-3538
FAX:	(301) 258-9749
e-mail:	mitchel@cme.nist.gov

28000 Series; CALS Infrastructure Standards

Contact:	Ms. Lynne Rosenthal
Phone:	(301) 975-3353
FAX:	(301) 948-6213
e-mail:	lsr@nist.gov cgminfo@nist.gov (for information on CGM) igesinfo@nist.gov (for information on IGES)

NIST Home Page: http://www.nist.gov

3.1.2 -- National Technical Information Service (NTIS)

CALS Information Center

Contact:	Ms. Kate Snyder (Manager)
Phone:	(703) 487-4823
FAX:	(703) 487-4131
e-mail:	ksnyder@ntis.fedworld.gov
Home Page:	http://www.fedworld.gov/edicals/calsinfo.html

3.2 -- Department of Defense (DoD)

The following DoD POC's provide information regarding CALS and related support agencies:

3.2.1 -- Office of the Under Secretary of Defense (Acquisition & Technology)/CALS

Acting Director, CALS

Contact:	Mr. Mark Adams
Phone:	(703) 681-3450
FAX:	(703) 681-5682
e-mail:	adamsMM@acq.osd.mil

Deputy Director

Contact:	Mr. Bill Gorham
Phone:	(703) 681-7626
FAX:	(703) 681-5682
e-mail:	gorhamWC@acq.osd.mil

Engineering Architecture Development

Contact:	Mr. Don Hall
Phone:	(703) 681-3451
FAX:	(703) 681-5682
e-mail:	hallD@acq.osd.mil

Configuration Management (CM)

Contact:	Ms. Linda Burgher
Phone:	(703) 681-8475
FAX:	(703) 681-5682
e-mail:	burgheLS@acq.osd.mil

Integrated Data Environment (IDE)

Contact:	Ms. Nancy Moulton
Phone:	(703) 681-8461
FAX:	(703) 681-5682
e-mail:	moultona@acq.osd.mil

International CALS -- NATO

Contact:	Mr. Don Langkamp
Phone:	(703) 681-8455
FAX:	(703) 681-5682
e-mail:	langkaDE@acq.osd.mil

Technical Manuals/IETMs

Contact:	Ms. Dorothy Wright
Phone:	(703) 681-8476
FAX:	(703) 681-5682
e-mail:	writhDJ@acq.osd.mil

Education & Training

Contact:	Mr. Stanley A. Dubowski
Phone:	(703) 681-8474
FAX:	(703) 681-5682
e-mail:	dubowssa@acq.osd.mil

Data Management & Engineering Drawings

Contact:	Mr. Roland Henderson
Phone:	(703) 681-8466

FAX: (703) 681-5682
e-mail: renderRG@acq.osd.mil

International CALS -- non-NATO
Contact: Mr. Hervé LeBoeuf
Phone: (703) 681-8473
FAX: (703) 681-5682
e-mail: leboeuHJ@acq.osd.mil

Specifications, Standards and Testing
Contact: Mr. William Gorham
Phone: (703) 681-7626
FAX: (703) 681-5682
e-mail: gorhamWC@acq.osd.mil

Thrust Integration/Industry Liaison
Contact: Mr. Carl Berry
Phone: (703) 681-8457
FAX: (703) 681-5682
e-mail: berryCL@acq.osd.mil

OSD CALS Home Page address: http://www.acq.osd.mil/cals

3.2.2 -- Other DoD Offices

Defense Information Systems Agency (DISA), Engineering and Interoperability (D6)
Phone: (703) 607-6266
FAX: (703) 607-4093
Home Page: http://www.disa.mil
http://www-cals.itsi.disa.mil

JCALS Program Office
Phone: (908) 532-0400/DSN 992-0400
FAX: (908) 532-0403
e-mail: sfae-ps-cal@doim6.monmouth.army.mil
Home Page: http://150.149.1.11/jcals.html

JEDMICS Program Office
Contact: Mr. Bob Houts
Phone: (717) 790-5141
FAX: (717) 790-4199
e-mail: bob_houts@navsup.navy.mil
Home Page: http://206.3.148.4 -- (JEDMICS Requirements Tracking System)
http://wpaftb1.wpafb.af.mil/jedmics.html -- (AF)
http://wwwedms.redstone.army.mil/index.html -- (Army)

http://www.is.prc.com/jedmics -- (PRC)

Joint Logistics Systems Center (JLSC)

Contact:	Ms. Karen Wells
Phone:	(937) 255-3030
FAX:	(937) 476-7241
e-mail:	kwells@jlsc.wpafb.af.mil
Home Page:	http://www.jlsc.wpafb.af.mil
	http://www.jlsc.wpafb.af.mil/internal/demos.html

U.S. Army Logistics Integration Agency (LIA)

Contact:	Mr. Alan Schmack
Phone:	(703) 617-4481, DSN: 767-4481
e-mail:	ASCHMACK@ALEXANDRIA.ARMY.MIL
Home Page:	http://134.11.28.15/webs/logweb/cals/hmpg.htm

U.S. Army Materiel Command (AMC)

Contact:	Mr. Rich Callan, Dedicated CALS Office
Phone:	(703) 617-0249, DSN: 767-0249
e-mail:	rcallan@hqamc.army.mil

Lead Army Material Command Integration Support Office (LAISO) IDE Initiative

Contact:	Ms. Johnnie Duke
Phone:	(205) 955-9017, DSN: 645-9017
e-mail:	jduke@redstone.army.mil

U.S. Navy CALS/EDI Coordination Office

Contact:	Cdr. Keith Watkins
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FAX:	(717) 790-4150
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Home Page:	http://navycals.dt.navy.mil/cals.html

U.S. Navy CALS Program Coordinator

Contact:	Mr. Ed Kirkpatrick
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Home Page:	http://navycals.dt.navy.mil/cals.html

U.S. Marine Corps

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Section 5
Guide for Developing a CALS Government Concept of Operations (GCO)

1.0 -- Introduction

This document provides guidance to Program Managers and others in applying Continuous Acquisition and Life-cycle Support (CALS) to the acquisition of data products in support of defense systems. The CALS objective is an Integrated Data Environment (IDE) that will enable continuous process improvement through the use of digital technical information.

To provide potential bidders with an understanding of specific user needs for technical information throughout all life-cycle activities, a CALS Government Concept of Operation (GCO) should be developed and included in the section J of the Request for Proposal (RFP)/Request for Quotation (RFQ) as Government Furnished Information (GFI).

1.1 -- How to Use the GCO Section

This section is intended to be used as a guide for creating a GCO. A structural approach to implementing CALS requirements is provided. Figure 5-1 shows the relationship of the GCO to the contracting process narrated in paragraph 2. Figure 5-2 diagrams the process required to determine how CALS should be applied to the contract deliverables. Paragraph 3 provides the requirements, considerations, and processes for the elements described in figure 5-2.

Questionnaire templates contained in exhibit 1 facilitate part of the process in the development of required information for the GCO. These templates should be provided to those Service activities that are anticipated to provide support to the specific program for which a GCO is being developed. This will aid in identifying the capabilities that exist and their supporting infrastructure. Exhibit 2 contains a sample GCO.

A software tool called the "GCO Generator" has been developed to assist the Program Manager in creating a GCO. The tool requires input of data on program infrastructure, data use, and experience with standard systems (e.g., JCALS). The tool creates the GCO text using program-specific inputs plus text from a database of standardized GCO text. All text is tailorable, and the final output is a program-specific GCO containing both text and data tables. To obtain a copy of the tool, please contact:

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e-mail: DubowsSA@acq.osd.mil

2.0 -- Relationship of the GCO to the Contracting Process

The GCO generated utilizing this guide will provide potential offerors an understanding of specific Government user needs for technical information throughout all relevant life-cycle activities of the defense system. The relationship of the GCO to the various contracting steps is shown in figure 5-1.

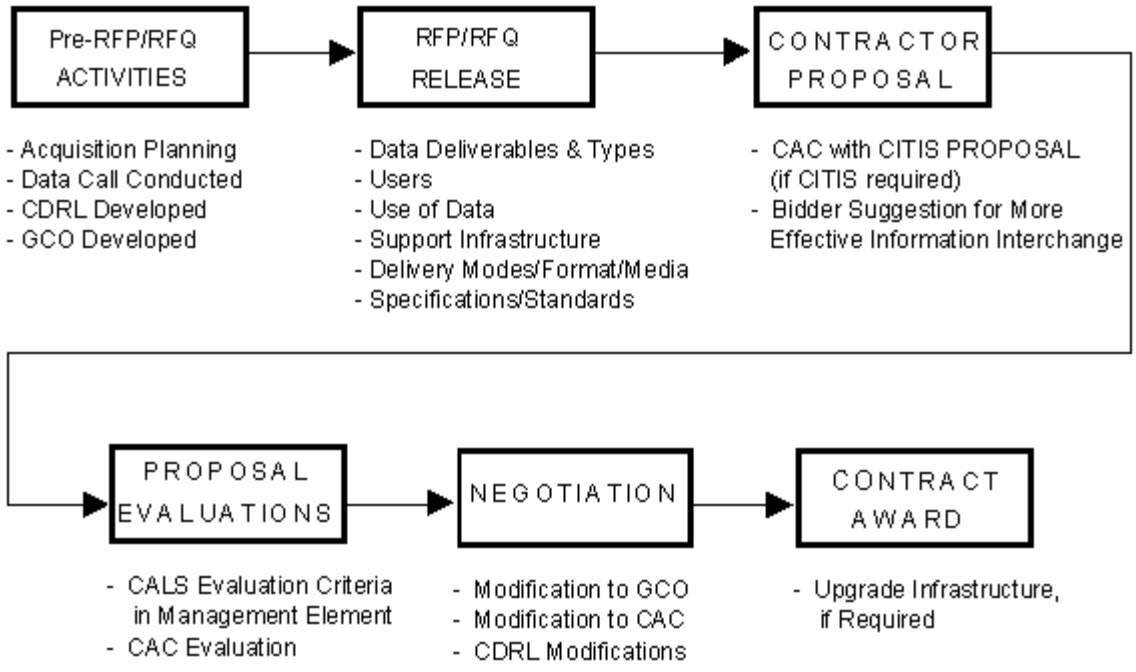

Figure 5-1. -- The CALS GCO in the Contracting Process.

2.1 -- Pre-RFP/RFQ Activities and RFP/RFQ Release

The GCO planning process should start as early in the acquisition process as possible. The GCO is a Government document that is prepared during the acquisition planning and requirements determination activity for each procurement. It is used to provide information to potential offerors about the Government's infrastructure and CALS implementation strategy for defense systems. The process for gathering the GCO information should simply be part of the overall data call during the pre-RFP/RFQ activities. A GCO survey (see sample survey in exhibit 1) should be distributed to the functional organizations along with the normal data call information.

Development of a GCO will help ensure that the Government receives the correct version and formats of digital data products needed to acquire and support a defense system. The GCO can assist the Program Manager in determining:

- The hardware and software systems the Government has, or is developing, to manage and use the data;
- Data users, types of data, frequency of use, and timeliness of data access or delivery to each user;
- Data use and the review and/or approval processes to support life cycle functions;
- Users' locations and their primary functions in support of the defense system;

- Data interchange requirements including format, media, applicable standards, and existing telecommunications capabilities;
- Access authorizations and restrictions; and
- Data acceptance requirements including data format and content of data and the Government processes for accepting data.

A flow diagram of the entire process is shown in figure 5-2. The suggested methodology to determine the data acquisition requirements as diagrammed in figure 5-2 is contained in paragraph 3.

2.2 -- Contractor Proposal

Referencing the GCO, potential bidders should develop a Contractor's Approach to CALS (CAC) in their prepared responses to the RFP. The CAC is a description of the contractor's approach, experiences, and successes in the creation, management, use, and exchange of digital information. The CAC can then be evaluated by the Government during the source selection process. If CITIS requirements are included in the RFP, the contractor should address the approach to CITIS within the CAC. See section 6 'CITIS' for a more detailed discussion of CITIS.

Bidders should be encouraged to identify, within their CAC, a more efficient and more cost effective data strategy. Section L of the RFP, for example, can be used to offer potential bidders the opportunity to review the GCO and the RFP data requirements and propose alternative forms of delivery of digital data products and information services that reduce life-cycle costs and improve business processes.

2.3 -- Proposal Evaluation

CALS requirements are typically included in the Management Element of a proposal. Evaluation criteria for CALS in general and the CAC may be derived from DoD 5010.12-M (May 1993). Information in the CAC is used to gauge the risk associated with the contractor's ability to provide the digital data products and services required by the RFP.

2.4 -- Negotiation

Differences in concepts of operation between the Government and the bidder selected through the source selection process become a subject for negotiation. The agreements reached during negotiation become the basis for a contract that triggers feedback to all Service activities involved in the support of the defense system and subsequent changes to the GCO and perhaps the CAC. Any selected alternatives proposed by the contractor must also be incorporated into the contract and appropriate Contract Data Requirements List (CDRL).

2.5 -- Contract Award

The solicitation and ensuing contract should state that an objective of the acquisition is to require the contractor to generate information products for development and production functions in an integrated information system and a shared data environment to the maximum extent practicable. Ideally, this

integration should be achieved as part of a comprehensive concurrent engineering strategy. The integrated environment will provide for generation, storage, indexing, distribution, access, and delivery of digital technical data products in support of defense system development and production functions and processes. The objective is to create each data element once and use it repeatedly in subsequent processes without manual reentry work and labor costs.

Developing this integrated environment will most often require a phased approach for implementation. Some agencies may choose to accept the CAC as the sole CALS related document in lieu of asking for both a CAC and a CALS Implementation Plan (CALSIP). However, if the CAC does not provide adequate detail on the CALS implementation approach, the program manager may wish to require a CALSIP as a contract deliverable (typically 60 days after contract award). The CALSIP is a document that should be maintained throughout the life of the contract. The CAC, if one was required, can be used as the basis for the CALSIP.

An alternative to the CAC and/or CALSIP could be something like an IDE Implementation Plan or Program Data Integration Plan. Regardless of what it is called, each program needs to have a plan for how it will create, manage, and use digital data, and how the infrastructure will function to achieve the program's goals.

Next Section