LOAN DOCUMENT

PHOTOGRAPH THIS SHEET

AD-A265 329

DTIC ACCESSION NUMBER

LEVEL

1

INVENTORY

Baseline Architecture Analysis of Weapon System Technical Information Army Vol. 8

DOCUMENT IDENTIFICATION

Sep 89

DISTRIBUTION STATEMENT A

Approved for public release
Distribution Unlimited

DISTRIBUTION STATEMENT

HANDLE WITH CARE

ACCESSION FOR

NTIS GRA&I ☑

DTIC TRAC ☐

UNANNOUNCED ☐

JUSTIFICATION

BY Per LTC

DISTRIBUTION/

AVAILABILITY CODES

DISTRIBUTION	AVAILABILITY AND/OR SPECIAL
A-1	

DISTRIBUTION STAMP

DTIC
ELECTE
MAY 28 1993
S C D

DATE ACCESSIONED

DATE RETURNED

93-12165

93

DATE RECEIVED IN DTIC

REGISTERED OR CERTIFIED NUMBER

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-FDAC

DTIC FORM 70A JUN 90

DOCUMENT PROCESSING SHEET

PREVIOUS EDITIONS MAY BE USED UNTIL STOCK IS EXHAUSTED

LOAN DOCUMENT

VOLUME 8
CALS Draft Baseline
Architecture Analysis of
Weapon System Technical
Information Army

8

Office of the Secretary of Defense
Computer-aided Acquisition &
Logistic Support (CALS)
Policy Office

September 1989

Draft

Baseline Architecture Analysis of Weapon System Technical Information – Army, Navy and Air Force

Prepared By

U. S. Department of Transportation
Research and Special Programs
Administration
Transportation Systems Center
Cambridge, MA 02142

Preview

These reports contain the core information necessary to document the Baseline Architecture Analysis of Weapon System Technical Information for the Army, Navy and Air Force. It's contents include a high-level baseline of the Product Definition (PD) and Logistics Support (LS) processes and supporting appendixes. Additional appendixes (D, E, F), not included in these reports, may be found in a supplementary report.

Office of the Secretary of Defense
Computer-aided Acquisition &
Logistic Support (CALS)
Policy Office

September 1989

Draft

Baseline Architecture Analysis of Weapon System Technical Information – Army

Prepared By

U. S. Department of Transportation
Research and Special Programs
Administration
Transportation Systems Center
Cambridge, MA 02142

Preface

In August 1988, the Deputy Secretary of Defense issued a memorandum directing new weapon systems acquisitions and related major equipment items to routinely include the use of Computer-aided Acquisition and Logistic Support (CALS) standards. The CALS Office of the Secretary of Defense (OSD) is taking a lead role in planning the successful implementation of the CALS program throughout DoD. A key activity in this planning process is developing a CALS architecture. The CALS architecture will be described in the DoD Architecture Guidelines which will provide guidance to the Services and the Defense Logistics Agency (DLA) for the planning and execution of their respective CALS programs. The Guidelines will outline the evolutionary steps from the present paper-intensive weapon system lifecycle processes to a highly automated, paper-free technical environment.

The guidelines will be derived from studies of the current environment within each of the Services and DLA. The results of each study have been documented in a baseline architecture report titled Baseline Architecture Analysis of Weapon System Technical Information. There are four reports which present the baseline architecture for the Army, Navy, Air Force and DLA. The four studies are presented in a standard structure which will ease the task of cross service comparisons and other evaluations.

The work was performed under the direction of Dr. Robert Smith of the Information Integration Division at the Transportation Systems Center (TSC). TSC has drawn upon the skills and knowledge of several consultants. This has enabled the development of a multi-faceted team of experts each of whom has made a vital contribution. TSC would like to extend its gratitude to the following organizations: CACI, INC.-FEDERAL, Coopers & Lybrand, EG&G DYNATREND Inc., and UNISYS Inc.

This attached study identifies a baseline for the development of an automation plan to receive, store, use, and disseminate digital technical information in the Army. It describes how the Army currently plans, controls and executes processes which either create, manage or use weapon system technical information.

Table of Contents

SECTION I: INTRODUCTION

Introduction

This draft report was developed between 28 February 1989 and 1 August 1989, under UNISYS purchase order number 825104S. CACI, INC.-FEDERAL produced the report to assist the Transportation Systems Center (TSC) in its support of the Computer-aided Acquisition and Logistic Support (CALS) planning group of the Office of the Secretary of Defense (OSD).

Purpose

This effort was performed to provide a common framework for analysis and planning of CALS initiatives across the military services, leading eventually to the development of a common DoD-wide architecture for CALS.

Scope

This study addresses Army technical data management related to product definition (PD), logistics support (LS), and technical manuals (TM). The study also identifies how and where the Army can apply information technology to a highly automated environment. The primary product is a high-level baseline architecture, appropriate for review by executive military leadership.

Methodology

The methodology followed is provided by the Transportation System Center, and is the same as that followed by other contractors building similar documents for the Air Force, Navy, and DLA facilitating comparison of similar activities in all services.

This document uses a series of matrices to present a high-level baseline architecture of the process, data, and organization which the United States Army employs to manage technical aspects of a) technical manuals, b) product definition, and c) logistics support. A total of nine matrices are presented, three (process, data, organization) for each of these three technical data areas.

The matrices are designed to mirror the "Anthony Model", a model built on the premise that every organization must **plan, control and execute** processes in order to accomplish its

mission. Each process produces data, each process is unique, and each process is the responsibility of at least one organizational entity.

For each of the technical information areas (PD, LS, and TM), the matrix analysis is augmented by 1) an Army organizational structure view of the major players in that area; 2) a list of high level findings and conclusions not related to any specific technology application, but focused more on process, organizational, and data issues, and 3) a table describing how the Army might apply technology in the short, mid, and long term timeframes to evolve to target capabilities, and the improvements that could result from doing so. In addition, two flow diagrams provide a dynamic view of data to complement the static view portrayed in the matrices.

The content of this document was developed using Army source documents, such as regulations and pamphlets, and recent technology assessment forecasts done for the Air Force. The most important source documents were the databases developed by CACI, INC.-FEDERAL in a recent project for PM CALS (Army) to perform a functional analysis of the management of logistics technical data in the Army. Verification of this current environment, as outlined in the matrices, was accomplished through a series of interviews with key Army personnel who are familiar with technical data and information management. Additional problems and opportunities related to the scope of this study were extracted from verified sources.

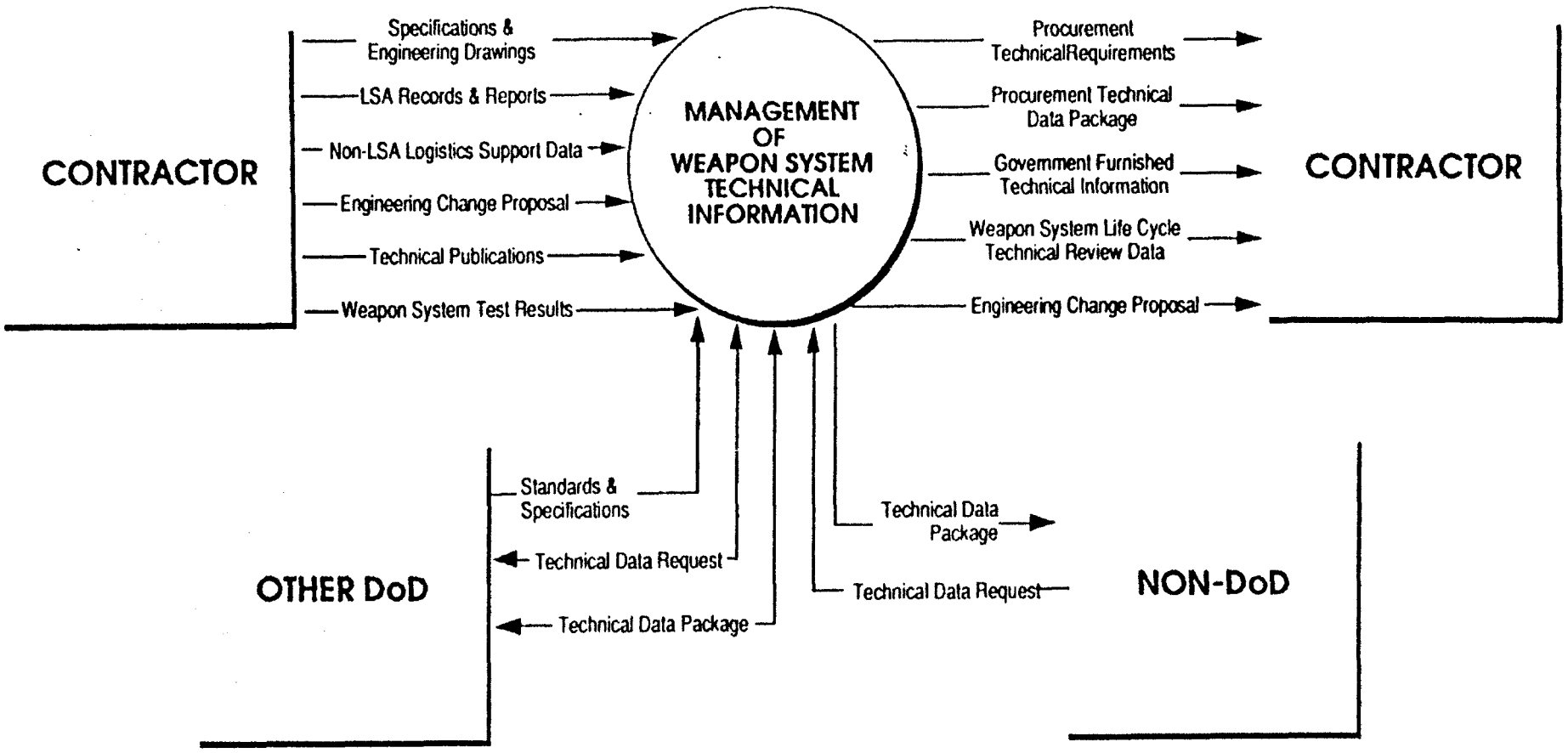
The Flow of Technical Information

The flow of weapon system technical information within the Army and between the Army and its business environment is depicted at a high level in the two charts which follow: Context Diagram, and Level 0 Diagram.

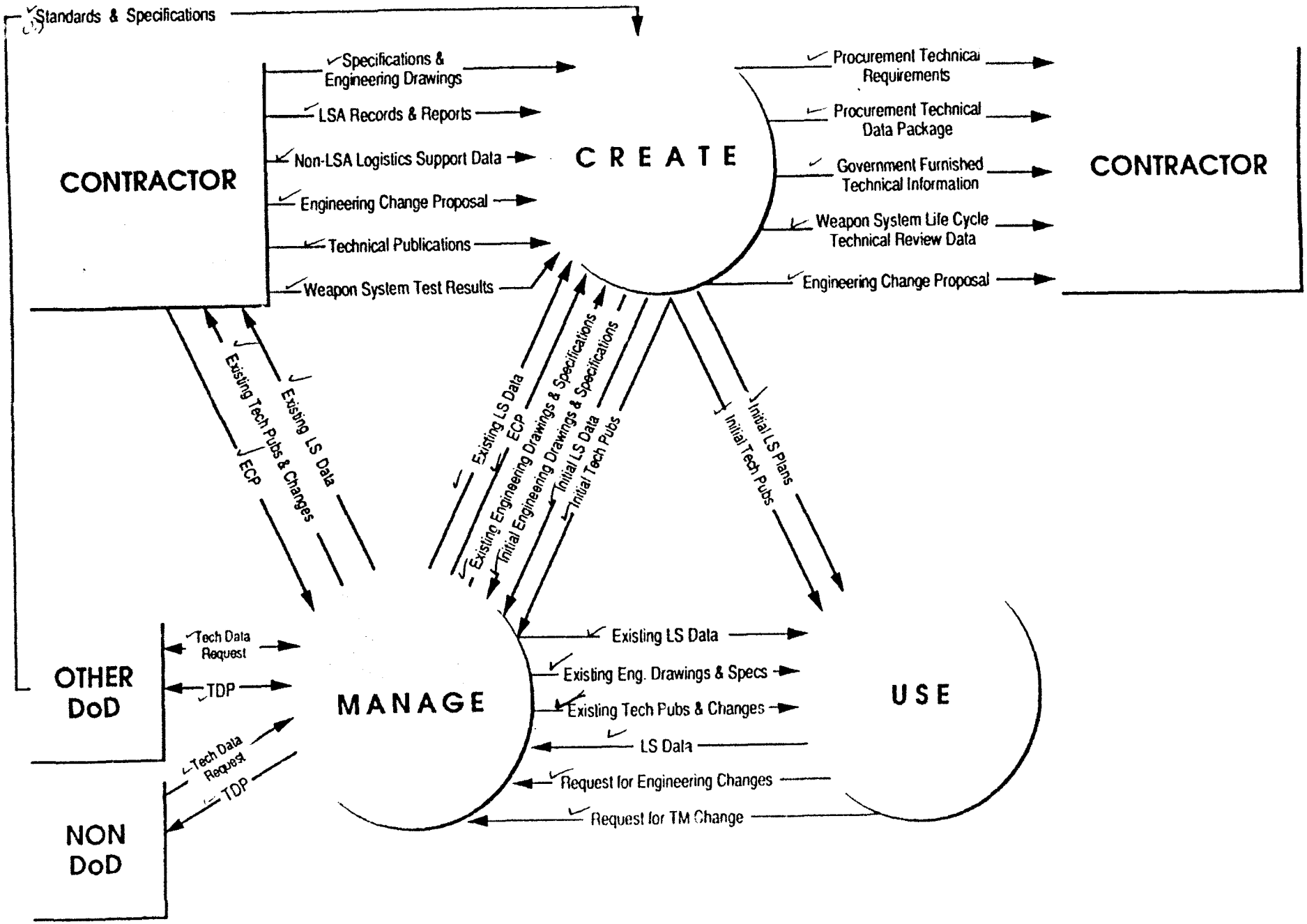
Treating the management of weapon system technical information as a single process, the Context Diagram portrays the major information exchange between the Army and organizations in its business environment. Clearly, the Contractor, who generates most of the weapon system technical information used and managed by the Army, is the principal business "partner". A significant amount of technical information is interchanged between the Army and the other military services and DLA and, to a lesser extent, between the Army and non-DoD agencies such as GSA and foreign military organizations.

In the Level 0 Diagram, we peer into the single large process of the Context Diagram to examine how the Army creates, manages, and uses weapon systems technical information. The *create* process includes those processes in the Army associated with managing technical

Weapon System Technical Information - ARMY
CONTEXT DIAGRAM



Weapon System Technical Information - Army
LEVEL 0 DIAGRAM



information during the weapon system acquisition cycle: *specifying* requirements, *reviewing* contractor deliverables, and actually *acquiring* the final products specified in the contract.

The *manage* process includes those Army processes associated with ongoing management of acquired technical information: *controlling* the update process through configuration management and other means; *maintaining* Army files and manuals of technical information through physical update of them; and *distributing* existing technical information to whomever has a need and a right to have it, both within the Army and outside it.

Finally, the *use* process includes those Army processes which make direct, mission area use of existing technical information. *Use* processes include *maintenance* of equipment, *supplying* the users of materiel, and *reprocuring* additional stocks of existing types of materiel.

The information flows which appear in these two diagrams describe major categories of information, the contents of which appear in the data matrices in following sections on Product Definition, Logistics Support, and Appendix on Technical Manuals.

SECTION II: PRODUCT DEFINITION

Introduction

The Product Definition (PD) matrices, which immediately follow this short summary of their content, describe the process and the organization involved in the collection, preparation and consolidation of weapon system technical data for the product definition.

The management of PD in the Army deals mainly with that engineering and technical data that governs the configuration of an item or system. As defined in AR 700-15 and DODI 5010.12, technical data is recorded information used to define a design and to produce, support, maintain or operate items of defense materiel. This technical data may be recorded as graphic or pictorial delineations in media such as drawings or photographs; text in specifications or related performance or design type documents; in machine form such as punched cards, magnetic tape, computer memory printouts; or may be retained in computer memory. Examples of recorded information include engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog items identifications and related information.

The PD data is originated in system and program management documentation and is contained in materiel, decision and program documents such as: ROC, O&O, PMD, Acquisition Plan, ILSP/LSAP, CMP, PMP, etc. A more complete list can be found in AMC/TRADOC Pam 70-2. These documents not only contain selected technical data and data elements, but also guide the development of all PD for a system. The PD is called for and acquired during the development process, managed by the PM and MSC FDM, and used by the MSC to execute the logistics function through the item/system life cycle.

Using program documentation, the PM initiates a data call to the MSC functional matrix support SDMO, who in turn issues a PPI data call to the appropriate MSC FDM responsible for PD data. The PD requirements are returned to the SDMO in the form of SOW, CDRL, DIDS, Specs, etc. which are combined into a PDP and contract for solicitation and award. After award the PM/MSC team provides PD technical guidance to the contractor and establishes a plan for review of the design or PD data developed by the contractor. The PD data being developed by the contractor is constantly monitored and reviewed during IPRs, functional team meetings and contractually specified design reviews (PDR/CDRs).

The system development contractor is normally responsible for the configuration management until type classification is accomplished when the government assumes formal configuration control under the direction of a Configuration Control Board (CCB). ECPs and

ECRs are processed and controlled based on established MIL STDs and control practices/ procedures.

The PD data is accepted by the appropriate PM/MSC FDM and stored in a library for retrieval and use for various reasons throughout the weapon system life cycle. Currently the data is produced in varied formats as described in the definition of technical data given above.

Changes to the item configuration and its PD data occur throughout the item's useful life. Change proposals can come from any materiel user/operator, maintainer, trainer or contractor. Normally changes from the field are produced in the form of an EIR/QDR or TM change form (DA Form 2028). Upon approval of the configuration change or PD data change by the CCB, the change is executed in a PIP or MWO. Depending on the complexity of the change the execution of that change will be controlled by a PRIMIR or in the normal MSC course of business. A PIP may result in a new fielding process or may be executed as an MWO by DESCOM. Minor modification or changes to the equipment or data in the field may be executed by the field commands.

Based on supply demands/requisitions or other user requests (Foreign Military Sales cases, etc.), supply control studies produce the requirement to initiate reprocurement of items or systems. The supply control studies are produced by the Commodity Command Standard System (CCSS) and generate a Procurement Work Directive (PWD) which facilitates the funding and reprocurement process. There are different levels of effort or process to control the reprocurement which depend on the accuracy of the TDP, time since the last procurement, dollar threshold, etc. This control process is slightly different from MSC to MSC.

The PWD (machine or manually produced) initiates the reprocurement process. The SDMO will determine the control process and conduct a PPI data call or request a TDP from the CCSS. CCSS produces a pull tape which goes to the storage and retrieval facility to pull a TDP. The MSC FDMs are responsible for updating the PD in the TDP at all times or as changes occur. The TDP is combined with necessary procurement data and sent to the SDRB/ DRRB for approval. Bid Sets are assembled based on a bidder list provided by CCSS and forwarded to procurement for solicitation.

PROCESS (Product Definition) - Army

	SPECIFY	REVIEW	ACQUIRE	CONTROL	MAINTAIN	DISTRIBUTE	MAINTE-NANCE	SUPPLY	REPRO-CUREMENT
PLAN	• Develop O&O/ROC (TRADOC) • Prepare PMD (AAE) • Prepare Acqn Pln (PM) • Prepare ILSP (PM) • Prepare CMP (PM) • Prepare PDP (PM)	• Determine Content of Design Package (PM) • Conduct Guidance Conference (PM)	• Initiate ECP (Contr MSC-FDM)	• Establish Configuration Control Practices/ Procedures, Stds, (MSC-SE/CCB)	• Develop PIP (MSC-SE)	• Initiate PD Request (MSC-FM/SDMO)	• Initiate EIR/QDR (MACOMS/ DESCOM)	• Establish Requirements for Interchangeability and substitutability (MSC-FDM)	• Initiate Spares Requirements (MSC-MM)
CONTROL	• Transmit Data Call (PM) • Evaluate Data Call Input (PM/MSC-FDM) • Approve PDP (SDRB/DRRB) • Coordinate Contract Award (PM/MSC-PP)	• Monitor Engineering Design Data (PM/MSC-FDM) • Manage In Process Reviews (PM/MSC-FDM)	• Review/Approve ECP (CCB)	• Assess Regs and PD Pubs (MSC-All)	• Review/Approve ECP (CCB) • Manage PRIMIR (MSC/AMC/ ODCSOPS)	• Evaluate PD Request (MSC-FDM)	• Evaluate EIR/QDR (CCB) • Manage MWO Development (MSC-SE)	• Manage Parts Breakout (MSC-ME) • Evaluate Interchangeability and Substitutability of Parts (MSC-FDM)	• Manage MOD (MSC-MM) • Coordinate Procurement Pkg Input (PPI) (SDMO) • Review TDP (MSC-FDM)
EXECUTE	• Perform Data Call (SDMO) • Assemble TDP (SDMO) • Release PDP to Contracting (PM)	• Conduct PDR/CDR (PM/MSC-FDM)	• Finalize TDP (MSC-FDM) • Accept TDP/Engineering Data (CCB)	• Analyze/Accept Configuration Data (MSC/CCB)	• Execute ECP (CCB) • Update TDP (MSC-FDM) • Load AMSR/DSREDS (ISC-MSC)	• Reproduce/ Assemble Bid Set/Tech Data (ISC-MSC) • Load/Update Tech data into IPS (MSC-FDM)	• Perform MWO (MACOMS/ DESCOM)	• Implement Interchangeability and Substitutability of Parts (MSC-FDM)	• Assemble TDP/TDPL (SDMO/FDM) • Assemble Bid Sets/PDP (MSC-PP)
	CREATE			MANAGE			USE		

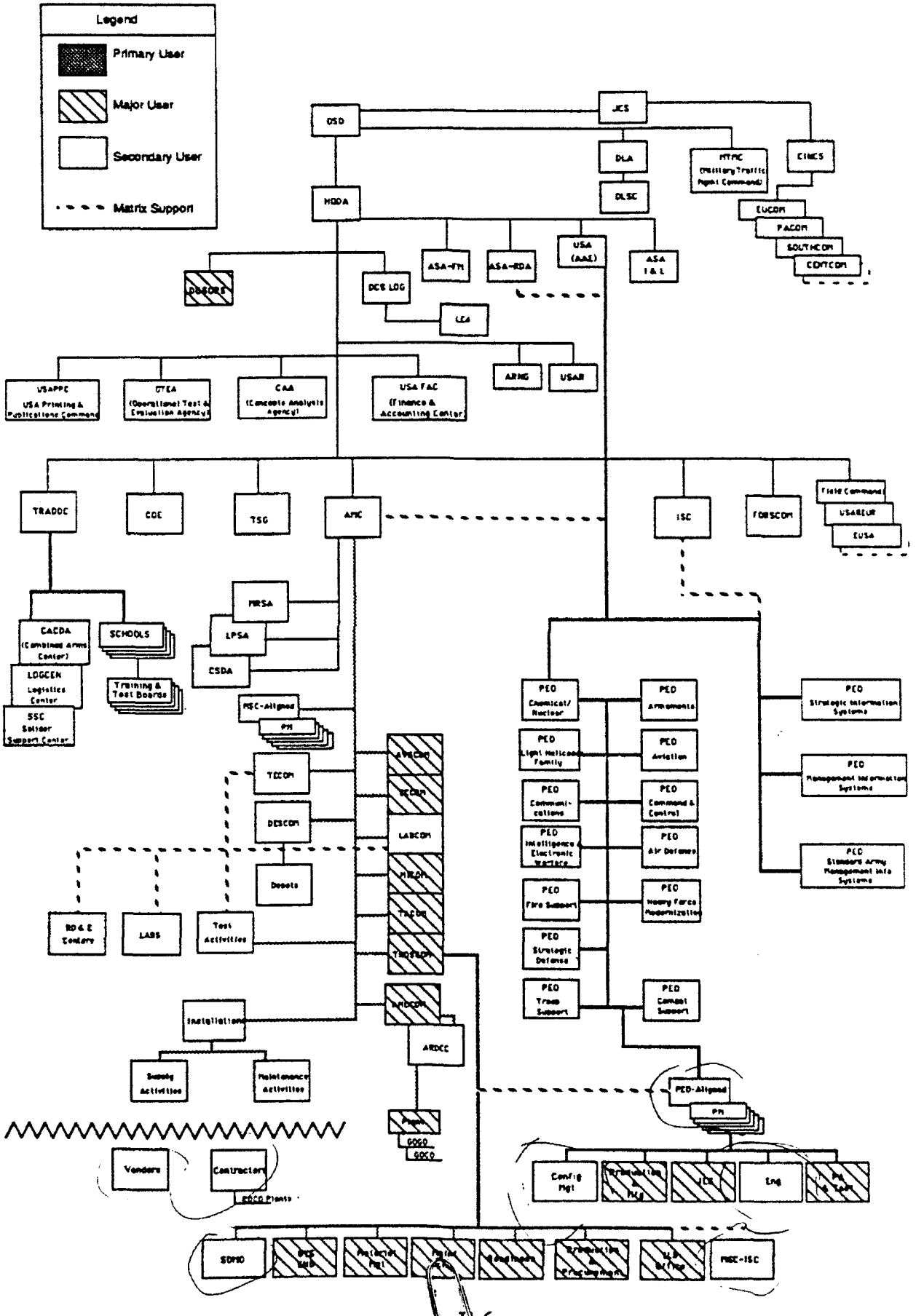
ORGANIZATION (Product Definition) - Army

	SPECIFY	REVIEW	ACQUIRE	CONTROL	MAINTAIN	DISTRIBUTE	MAINTE-NANCE	SUPPLY	REPRO-CUREMENT
PLAN	• TRADOC • AAE • PM • AMC-MSC	• PM	• MSC-FDM • Contractor	• MSC-SE • CCB	• MSC-SE	• SDMO • MSC-FDM	• MACOMs • DESCOM	• MSC-FDM	• MSC-MM
CONTROL	• PM • MSC-FDM • SDRB/DRRB • MSC-Contractor	• PM • MSC-FDM • Contractor	• CCB	• MSC-FDM	• CCB • MSC • AMC • ODCSOPS	• MSC-FDM	• CCB • MSC-SE	• MSC-FDM	• MSC-MM • SDMO • MSC-FDM
EXECUTE	• SDMO • PM	• PM • MSC-FDM • Contractor • TECOM • Test Activity	• CCB • MSC-FDM	• MSC-SE • CCB	• CCB • MSC-FDM • ISC-MSC	• ISC-MSC • MSC-FDM	• MACOMs • DESCOM	• MSC-FDM	• SDMO • MSC-FDM • MSC-PP
	CREATE			MANAGE			USE		

DATA (Product Definition) - Army

	SPECIFY	REVIEW	ACQUIRE	CONTROL	MAINTAIN	DISTRIBUTE	MAINTE-NANCE	SUPPLY	REPRO-CUREMENT
PLAN	O&O Pln ROC PMD Acqn Pln PMP ILSP CMP PDP	TDP Rqmts	ECP	Configuration Control Practices/ Procedures and Standards	PIP Configuration Data Engineering/Design Data	PPI Configuration Data Engineering/Design Data	EIR/QDR TMS • DMWR	• Engineering Drawings & Specifications	Supply Control Study
CONTROL	Data Call SOW CDRL DIDs Specs PDP Other Contract Data	Engineering Drawings Revised Engineering Data Specifications Associated Lists	ECP Engineering/Design Data	PD Regs and Pubs	ECP PRIMIR	PPI Data Call Tech Data	EIR/QDR • MWO	Engineering Drawings & Specifications	MOD • PPI • TDP
EXECUTE	Data Call TDP PDP	Engr drawings Test Data Specs System Diagrams	TDP Specs Level 3 Drawings Tech Rpts Quality Control Rpts Safety Rpts Packaging Data	TD/CMS File Data Engineering/Design Data Configuration Data	ECP TDP • DSREDs	Bid Set/Tech Data	MWO TMS • DMWR	Engineering Drawings & Specifications	TDP/TDPL Bid Sets/PDP
	CREATE			MANAGE			USE		

MAJOR PD PLAYERS — ARMY



FINDINGS - PRODUCT DEFINITION

ORGANIZATION

- There are many organizations, activities (TRADOC, MRSA, LOGCEN, etc.) and field unit MACOMs in different geographic locations that provide input or review PD data. Due to organizational diversity and dispersion, review of system specifications and tech data requirements (SOW, CDRL, DID) is often inadequate.

- Each MSC is organized differently, has a changing mix of PM matrix support personnel, and has a different method/process for tech data management. The PMs and functional organizations within the MSCs (SDMOs) have difficulty in aligning system specifications and drawing requirements with the PMP, ILSP or CMP. Contractor execution is complicated due to different

PROCESS

- Review and approval of tech data by the CCB members is a manual, time consuming process which directly affects the timeliness and quality of the review. Consequently, configuration control standards are not uniformly applied or enforced in the PDR/CDR process.

- The level of training of MSC-FDM is not consistent with the level of expertise required to develop, specify, review or accept tech data. Consequently, tech data/drawings are too often not adequately reviewed for accuracy and conformance to system specs and CDRLs as outlined in applicable MIL-STDs.

- Retrieving, updating and loading tech data/ drawings from AMSR is a manual, ineffective, nonstan-

DATA

- Data Calls are not specific enough for MSC FDM to properly tailor system specs/drawing requirements. Consequently, overordering is too often the norm, resulting in extra effort and expense.

- TDP requirements (SOW/CDRL/DID) are normally maintained by MSC-FDM in a manual file and are seldom updated or tailored to reflect system specs or data requirements updates until needed for reprocurement. Consequently, tech data/drawings rarely reflect latest item configuration.

- The age and quality of the tech data/drawings to be stored in AMSR/DSREDS is sometimes old and poor, thereby requiring manual review and updating prior to loading. Some data cannot be automated,

ORGANIZATION	PROCESS	DATA
delivery requirements of different MSCs under the same contract.	dard process at the MSCs, inhibiting reprocurement and product quality.	thereby requiring maintenance of two storage systems and processes.
• The MSC-FDM, PM and TRADOC personnel must review tech data developed by contractors. This review requires extensive travel to contractor's plant sites.	• The manual manipulation of the tech data inhibits the process of recommending equipment changes (EIR/QDR), implementing the change (ECP/PIP/MWO), and updating the tech data (drawings, TMs, etc.).	• The data maintained in the TD/CMS does not always reflect the latest listing of tech data (TDPL, generation breakdown, where-used info, outstanding ECPs, etc.) required for logistics operations and/or reprocurement.
• The organizational level of involvement and interaction is governed by the program/procurement size and tech data complexity. Organizational functional interfaces thus are dynamic and program dependent.	• The manual manipulation of the tech data inhibits the process of data calls, PPI by FDM, building the TDP/PDP by PM/SDMO, and TDP/PDP review by DRRB/SDRB.	• Tech data for various weapon systems configurations is commonly maintained as complete data sets, to include TMs and DMWRs; e.g., each configuration of main battle tank at a depot is managed as a unique entity, rather than using common tech data sets for common components.
• Evidence suggests that a new industry is emerging to support the digital storage, management and transfer of PD data for small contractors who	• There are no Military Standards or test capability in place to insure that (test) contractors are in fact CALS compliant when they claim to be.	• The Integrated Procurement System - Technical

ORGANIZATION	PROCESS	DATA
cannot afford expensive digital equipment and other government and contractors who do not wish to maintain PD data.	• Today's engineering students are taught computer generated data development and manufacturing techniques (CAD/CAM/CEM). • Integrate the vendor into the logistics system through a standardized EDI system and supported by a Vendor Quality Program (QVP) and multi-year contracts. Through Value-Added Partnerships (VAP), a complex organization with a large infrastructure, such as the Army, can take advantage of technology and innovative processes to solve some of its most difficult logistics problems.	Loop (IPS-TL) program, currently under development by AMC, proposes to automate the technical data flow within AMC MSCs. • The DSREDS system is not CALS compliant e.g., it does not use the standard compression algorithm. Plans are underway to upgrade the system. • The Army is adopting the Interactive Configuration Management System (ICMS), currently used by the Marine Corps, as its standard TD/CMS which will drive the DSREDS system to produce TDPs. • PD data is defined and described differently among the services and industry. • The PM JTF MAC EIDS program offers the opportunity for expansion and

ORGANIZATION	PROCESS	DATA
		enhancement of the PD data transfer to support TM and LS processes. • The Army does not buy enough PD data in a timely enough manner to facilitate the level of completion and multi-source procurement that can lead to major dollar savings.

CONCLUSIONS - PRODUCT DEFINITION

ORGANIZATION

- Tech data automation and modernization within the Army would enable organizations outside the AMC/Materiel Developer community to have improved access to program documentation and tech data to ensure timely and accurate input to tech data review and update cycles.

- The frequent changes in organizational and personnel MSC matrix support to PMs and changes in CCB organization adversely impact continuity and quality of tech data requirements generation and review.

- Standardizing the organizational structure and procedures within the MSCs would improve PD data management throughout the MSCs and would

PROCESS

- The initial TDP/PDP data call and review process is inefficient due to the manual transfer/ distribution of hard-copy program documentation and tech data. The numerous regulations, directives, standards and DIDs used to specify and control tech data are not easy to access, use, and maintain.

- Considerable savings in time and dollars would result if digitally stored and retrieved tech data/ drawings were electronically transferred between agencies/organizations. This electronic transfer would reduce requirements for IPRs, ILSMT, LSART, etc. DSREDS appears to be an effective system for storage and transfer of tech data/drawings.

DATA

- The method, type of equipment used, and level of automation used to store and retrieve tech data varies among MSCs. Furthermore, tech data transfers from mode to mode (digital, hard copy, mag tape, cards, microfilm/ fiche, 35mm film, etc.) from the time it is generated by contractor or government agency, until the time it is stored for record.

- The level of tech data (Level I, II, III, etc.) identified and procured during each phase of the development life cycle is not always sufficient to facilitate logistics operations such as provisioning, maintenance planning/allocation, training development and testing.

ORGANIZATION	PROCESS	DATA
significantly reduce the coordination difficulty between the MSCs. • Graphic workstations will ensure faster PD data review, updating and management of CM responsibilities such as PDR/CDRs and CCB functions, and support for simulation and modeling. • The advent of communications technology and large databases will cause the Army to rethink its organization and geographical structure to support specific functions. A savings of resources should result from consolidation of these functions.	• The process of initiating and assembling a reprocurement package/Bid Set/TDP through CCSS using the PWD, TD/CMS, and AMSRS/DSREDS is a non-standard, time consuming and difficult process to manage. • The Integrated Procurement System - Technical Loop (IPS-TL) program potentially will provide a standard automated process to transfer technical data in the reprocurement process. • OSD should strive for the development of CALS standards to govern the digital transfer of technical data and the government run test facilities to determine compliance. • A truly standard Product Data Exchange Specification (PDES) is required to	• Small contractors may not have the capability to generate, transfer and store digitized tech data in the foreseeable future. • PD data proprietary rights and liability issues must be resolved before digital PD data becomes a way of doing business. • The Army may not want to own and store all technical data; but may want to procure the right to access and manage a specified level of technical data with contractors providing storage.

ORGANIZATION	PROCESS	DATA
	define data levels and internal geometry of technical drawings which will allow development of application programs to manage, change and manufacture from a CAD file. • The core elements of tech data information should be defined and described in the same manner and language. • PD databases can be integrated with procurement databases to streamline the procurement process.	

EVOLUTIONARY IMPROVEMENT TO ARMY PD MANAGEMENT

	3-5 YEARS	7-10 YEARS	10-20 YEARS
What Information Technologies Could Enhance The Logistic Processes?			
PD	Increased definition and testing of data and graphics standards, e.g., PDES Automatic storage/retrieval systems; full benefits from TDCMS & DSREDS realized PD proprietary rights, liability issues being resolved; limited on-line access to contractors Early application of graphics terminals, e.g., CAD/CAM/CAE *"interface"* to PD process	Joint government-industry standards for tech data/graphics in final testing; PDES Prototype Prime contractors linked to government provide digital PD via standard EDI format Large databases allow multiple-user access to PD data Digital transfer prevalent for training Graphics workstations enhance PD drawings, specifications, manuals, etc.	Most contractors communicate PD data via standard EDI format to government and to other contractors PD data stored once; capable of being used (viewed) many times by government or industry Integrated PD data serves as "database" for interactive simulation and modeling; concurrent engineering Supercomputing capabilities reside in Desktop PCs Integrated voice/data/image, AI promote uniform friendly interfaces to computing
What PD Process Improvements Are Possible Through The Application Of Information Technology?			
PD	DSREDS coupled with TD/CMS to produce automated TDPs; reduces distribution delays MSC-FDM and CCB have on-line access to PD DB MSC PD organizational structures and procedures become standardized; improves quality and continuity of tech data requirements generation and review Methods and types of equipment used and level of automation used to store and retrieve tech data become standardized across MSCs	Databases allows PD data to become "reusuable" and *shared* with LS database PD DB *shares* data with Procurement DB Microfilm reduced by 50%; Paper 80% Army Data Dictionary requirements implemented on contracts; standardizes PD formats; common data access established All of above reduce time and costs to bid; reduces weapon system acquisiton cycle, $$	Supply requirements automatically generate *TDP and* procurement action Standard data elements reduce requirements for number of weapon system data sets; reduces reprocurement of existing or redundant PD data Engineering support could be consolidated and performed off-site; reduces on-site PDR/CDR Considerable savings in time and dollars result from digitally stored & retrieved tech data and drawings being transferred between organizations
How Can The Army Achieve These Logistics Process Improvements?			
PD	Complete initial coupling of DSREDS; TD/CMS Further define and test data and graphics standards; promote joint industry-government involvement Continue to resolve PD proprietary data rights, liability, warranty issues Further utilize graphics terminals (e.g., CAD/CAM/CAE) interfaces in PD processes	Complete implementation of digital transfer of PD data between AMC organizations Implement expert system(s) to identify opportunities for reusing PD data Link PD and Procurement DBs Institute automated access to PD data from contractors Acquire enhanced PD workstations, develop electronic libraries of tech data	Complete implementation of digital transfer of PD data between Army organizations and other government agencies, contractors Implement capability to allow PD data to serve as "database" for interactive simulation and modeling of weapon system performance and log support Utilize technological advances in computing technologies (e.g., supercomputing, expert systems) to enhance integration of computer-aided diagnostics, maintenance and R&M into processes Promote expert systems for maintenance functions

SECTION III: LOGISTICS SUPPORT

Introduction

The Logistics Support (LS) matrices, which immediately follow this short summary of their contents, describe the process for and the organization involved in the collection, preparation and consolidation of weapon system LS technical data.

The LS data consists primarily of the LSA and LSAR data, and that logistics data produced in the development, maintenance and support of an item or system. The LS data is used in the planning, control and execution of the logistics support process. LS data is created as a result of a user need and is managed and used by the materiel developer and field user.

As a result of a materiel need the TRADOC community will develop a ROC and O&O Plan. The development of materiel or systems to meet field needs is executed at the direction of the Army Acquisition Executive in the PEO and PM structure. The PM in conjunction with designated AMC MSCs and TRADOC proponents will develop materiel, decision and program plans containing logistics data to control the execution of the materiel development. Control of specific LS requirement generation processes is vested in several groups/teams such as the MANPRINT Joint Working Group, ILS Management Team, LSA Review Team, etc.

The PM will execute a data call with all appropriate materiel, decision and program documentation to the MSC for the development of the necessary LS data requirements. Because the input to the LS data requirements comes from many MSC FDMs and outside agencies/commands (TRADOC proponent schools, MRSA, MTMC, TEA, etc.), the PM will usually call a data call meeting to review program requirements. The SDMO of the primary MSC responsible for ultimate management of the item will issue a data call to all internal MSC FDM and outside agencies requesting specific LS data requirements in the form of SOW, CDRLs, DIDs, and Specifications. The MSC FDM responsible for LSA/LSAR will assemble all the LSA/LSAR data requirements and forward them to the SDMO for consolidation in the Program Decision Package (PDP).

Concurrent with the PM data call, the PM will submit the Basis of Issue Plan (BOIP) Feeder Data and the Data Interchange to identify the supporting equipment requirements, level of distribution, equipment replaces, and equipment required from other inventory control points, such as Associated Items of Equipment (ASIOE). From this information the MSC will develop the Qualitative and Quantitative Personnel Requirements Information (QQPRI) and forward both to TRADOC for review. TRADOC will develop the final BOIP. The Data

Interchange will be sent to other managing MSCs. A New Equipment Training (NET) Plan is also developed to control the new materiel fielding process. The Material Fielding Plan (MFP) is also prepared and forwarded to the gaining MACOMs. The LS data from these plans are used to develop the AMIM which is used to plan and control the budgeting and fielding process.

As LS data is produced it is reviewed by the respective MSC FDM or proponent and placed in the appropriate repository (CCSS, files, AMSRS, DSREDS, etc.). The LS data is shared by many organizations within and outside the materiel development community. LS data is normally exchanged in paper form. Most provisioning data produced by LSAR is transferred to CCSS (Commodity Command Standard System) and manipulated throughout the development process by the MSC FDM, primarily in the materiel management and maintenance engineering directorates. The majority of this LS data will find its way eventually to the TM (MAC and RPSTL), AMDF (supply and cataloging data), and training material.

After an item/system is fielded post provisioning and fielding assessments are conducted, primarily by MRSA and the MSCs, to determine the effectiveness of the fielding process and the suitability and supportability of the equipment. From these reviews lessons learned are generated to facilitate follow on equipment development and equipment and process changes. Depending on the size and scope of the program, Sample Data Collection will be conducted to validate the system/equipment operations and maintenance effectiveness, and the effectiveness of the support structure. LS data collected is used in LS assessment and the adjustment of LS parameters. This LS data is used in the budget planning process to determine range and quantity of spares throughout the lifecycle. LS data is continually updated and used in the management and execution of the reprocurement process. LSA and LSAR data is not normally updated after production has been completed.

Changes to LS data are also generated by the different item users during the operation, maintenance and supply support process. The user will generate EIR/QDRs which are reviewed and accepted by the MSC, and from which will follow PIPs and MWOs. Supply and cataloging data is also reviewed and changes are recommended normally in the form of a DA Form 2028. All of these changes are rigorously tracked within the MSC. Each MSC has Logistics Assistance Representatives (LAOs) in the field to validate the LS data and facilitate LS data changes and logistics system problems.

PROCESS (Logistics Support) - Army

	SPECIFY	REVIEW	ACQUIRE	CONTROL	MAINTAIN	DISTRIBUTE	MAINTE-NANCE	SUPPLY	REPRO-CUREMENT
PLAN	• Develop ROC and O&OP (TRADOC) • Prepare PMD (AAE) • Prepare Acq Pln (PM) • Develop PMP (PM) • Prepare ILSP (PM) • Prepare LSAP (PM) • Prepare SMMP (TRADOC) • Prepare CFP (TRADOC/MSC) • Prepare "A" Record (PM) • Prepare Prov Pln (MSC) • Prepare STRAP (TRADOC) • Prepare TEMP (PM)	• Prepare ILSMT Data (PM) • Prepare LSA Rev Team Data (PM) • Develop OOPRI (MSC-MR) • Develop NETP (MSC-MR) • Conduct Guidance Conf. (PM) • Develop BOIP (TRADOC) • Develop BOIPFD/DI (PM/MSC)	• Initiate TIR (TECOM) • Initiate ECR (Contractor) • Initiate DMSP Tasking (PM) • Prepare CCB Data (PM/MSC)	• Prepare MFP (MSC-MR) • Prepare MSP (MACOM) • Prepare AMIM (MSC) • Prepare DMSP (MSC-ME) • Prepare SDCP (MSC-ME)	• Initiate Post Provisioning Review (MSC-MM)	• Initiate Logistics Lessons Learned Program Review (MRSA)	• Plan for maintenance budget • submittal (MSC-ME/MR) Define Maint Policy & Procedures (ODCSLOG, MSC-All)	• Plan for Supply Budget submittal • (MSC-MM) Define Supply Policy & Procedures (ODCSLOG, MSC-All)	• Identify Supply Control Study (MSC-MM)
CONTROL	• Manage MJWG (TRADOC) • Transmit Data Call (PM) • Evaluate Data Call Input (PM/MSC-FDM) • Approve PDP (SORB/DRRB) • Coordinate • Contract Award (PM/MSC-PP)	• Conduct IPRs (PM/MSC) • Review LS Data Rqmts (ILSMT) • Review LSAR Data (LSART) • Conduct TIWG (PM/TRADOC)	• Coordinate ILS Planning Task (MSC-ILS) • Manage TIRS (PM) • Evaluate NET Pkg (MSC)	• Assess Regs & LS Pubs (MSC-All)	• Evaluate ECP (CCB) • Manage AMDF (MSC-MM/ME) • Evaluate SDC-F (MSC-ME)	• Coordinate LS Data (MSC-All/ TRADOC)	• Review/ Coordinate LS Data (MSC-ME) • Evaluate EIR/ODR (MSC-ME) • Review Readiness Rpts (MSC-MR)	• Review/Coordinate LS Data (MS-MM) • Evaluate EIR/ODR (MSC-MM) • Review Supply Demand (MSC-MM) • Monitor LIF (MSC-All)	• Manage PWD (MSC-MM) • Evaluate Proposals (MSC-All) • Manage Contracts (MSC-All)
EXECUTE	• Execute Data Call (PM) • Release PDP to Contracting (PM)	• Perform ILS/LSAR Team Reviews (PM, MSC-TRADOC)	• Accept LS Data (PM) • Perform Prov & Catalog (MSC-ME/MM) • Perform TEA (TEA)	• Load LS Data to CCSS (MSC-All) • Conduct NET (MSC-MR)	• Update LS Data (MSC-All) • Conduct Post Prod Rev (PM/MSC)	• Distribute LS Data (MSC-All)	• Perform Maint. TNG (TRADOC-SCH) • Use Maintenance Procedures (MACOM/All) • Test & Verify Parts (DCAS/DESCOM) • Maintain LAO/LAP Reports (MSC)	• Conduct Supply Control Study (MSC-MM) • Use AMDF/RPSTL (MACOM/All) • Execute Supply Distribution (MSC-MM)	• Conduct Break-Out (MSC-ME) • Execute Procurement Request (MSC-PP)
	CREATE			MANAGE			USE		

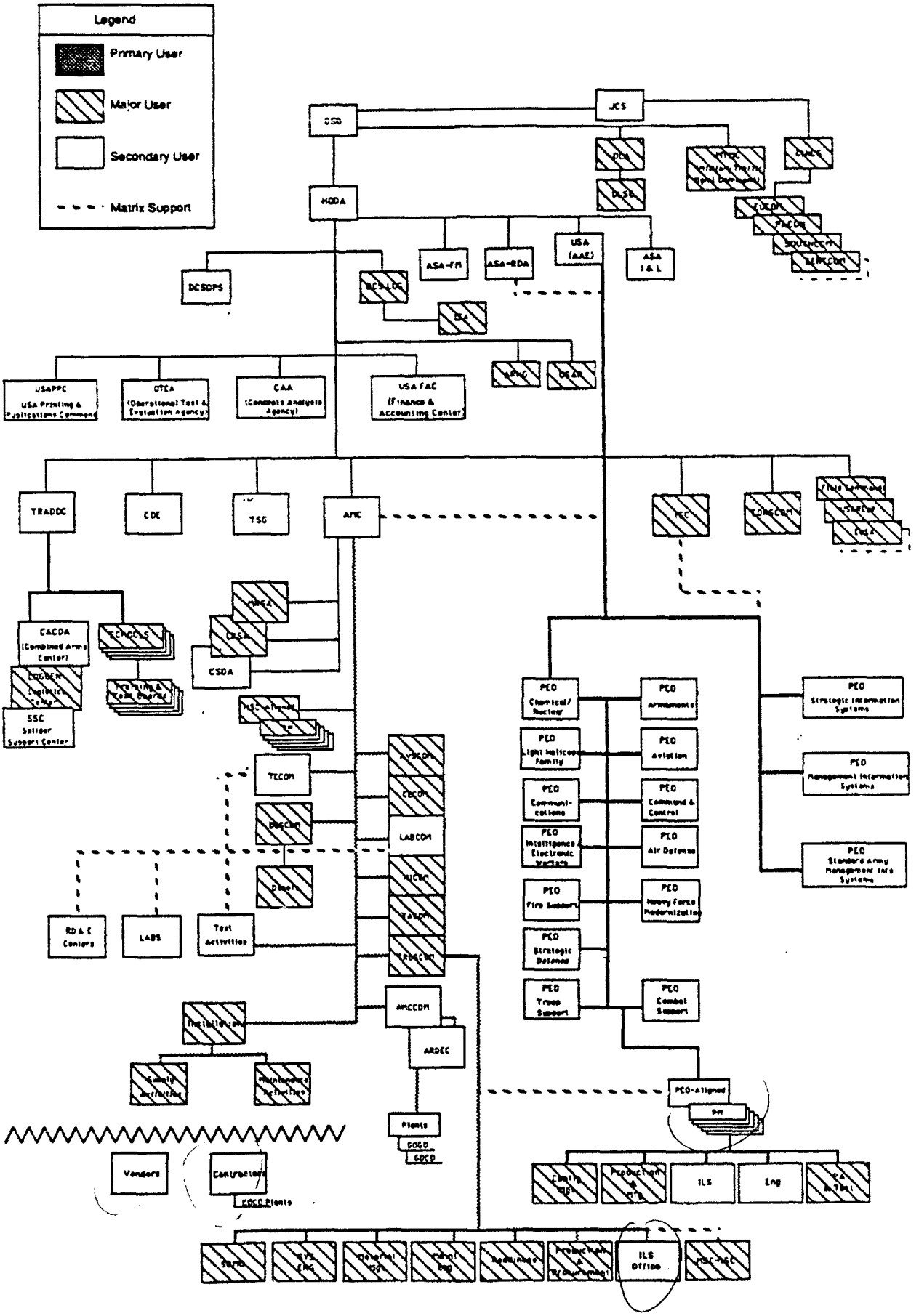
ORGANIZATION (Logistics Support) - Army

	SPECIFY	REVIEW	ACQUIRE	CONTROL	MAINTAIN	DISTRIBUTE	MAINTE-NANCE	SUPPLY	REPRO-CUREMENT
PLAN	• TRADOC • DCSOPS • PM • PEO • AAE • ASA (RDA) • AMC-MSC	• PM • MSC-MR • TRADOC • Proponent School	• TECOM • Contractor • PM • MACOM	• MSC-ME/MR • MACOM	• MSC-MM	• MRSA	• ODCSLOG • MSC-All	• ODCSLOG • MSC-All	• MSC-MM
CONTROL	• TRADOC • PM • MSC-FDM	• LSART • ILSRT • PM • MSC-All • Contractor	• MSC-ILS • PM	• MSC-All	• CCB • MSC-MM/ME	• MSC-All • TRADOC	• MSC-All	• MSC-All	• MSC-All • MSC-MM
EXECUTE	• PM • Contracting Office	• PM • MSC-All • TRADOC • MRSA • DESCOM • MTMC • LEA • Contractor	• PM • TEA • MSC-ME/MM	• MSC-All	• MSC-All • PM	• MSC-All	• MSC-MM • MACOM	• MSC-MM • MACOM	• MSC-PD • MSC-ME
	CREATE			MANAGE			USE		

DATA (Logistics Support) - Army

	SPECIFY	REVIEW	ACQUIRE	CONTROL	MAINTAIN	DISTRIBUTE	MAINTE-NANCE	SUPPLY	REPRO-CUREMENT
PLAN	ROC O&O Plan PMD ACQ Plan PMP ILSP LSAP "A" Record STRAP SMMP Provisioning Plan TEMP	ILSMT Data LSAR Review Team Data BOIPFD/OI NETP BOIP TAD	TIR ECR DMSP	MFP MSP AMIM DMSP SDCP	LAO/LAP Reports TAMMS Data	Readiness Reports TAMMS Data	Maint Regs & Pubs PPBES Data	Supply Regs & Pubs PPBES Data	CCSS Records and Reports
CONTROL	SOW CDRL DIDs SPEC	LS Change Data LS Analyses/ Records LS Data	TIR LS Data LS Analysis Records NET Pkg	LS Regs & Pubs LS Data LS Analysis Records	ECP AMDF SDC-F	LS/LSAR Data	LS/LSAR Data EIR/ODR CCSS Reports LIF TAMMS Reports	LS/LSAR Data EIR/ODR CCSS Reports LIF	MOD RFP/Proposal Contract
EXECUTE	Data Call POP	LS/LSAR Data LS Data LS Analysis Records	LS Data Cataloging Data FEA Data	LS/LSAR Data NET Package	LS/LSAR Data	LS/LSAR Data	CCSS Reports LAO/LAP Reports Training Materiel QA/QC Data TM MAC	CCSS Reports AMDF MRO QA/QC Data	PWD RFP LS Data
	CREATE			MANAGE			USE		

MAJOR LS PLAYERS — ARMY



FINDINGS - LOGISTICS SUPPORT

ORGANIZATION

- There are many organizations, activities and field unit MACOMs in different geographic locations that require accurate LS data. Organizational diversity and dispersion complicate LS data management functions.

- The functional organizations within the MSCs often do not receive LS data required to adequately manage an item. This is normally due to a lack of funding during development or inability of MSC-FDM to accurately specify data requirements during acquisition.

- Organizational responsibility for managing LS data transfers from the PM to the MSC long after the item is produced and fielded. The transfer is slow and difficult due to lack of required LS data or

PROCESS

- LS concepts are ill-defined prior to design and LS data specifications included in the initial data call are inadequate for planning. LSA, as a result, ends up documenting design after the fact instead of influencing the design through supportability analysis.

- Lack of sufficient, timely LS data and data updates results in less effective program reviews, lower product quality, late item deliveries and higher system costs.

- Configuration control standards for LSA formats, data structure and automated and manual data processing are neither uniformly applied nor consistently enforced. As a result provisioning is performed and spares acquired through both structured LS processes and

DATA

- LSA data is delivered by the contractor in many different forms (Mag tape, paper, cards, etc.), difficult to reproduce or review and difficult and costly to manage, store and maintain.

- Standard LS data elements and information is stored in many data bases, causing problems with synchronization and updating, reducing user confidence in the accuracy of that LS data at any given time.

- LS data is generated by field units in the form of failure and readiness data, changes to technical data contained in technical manuals and input to LS plans. This LS data is not always incorporated as updates to LS data stores in a timely and standard manner.

ORGANIZATION	PROCESS	DATA
because of inaccurate or incomplete data. • Different MSCs manage LS data differently, making it difficult to achieve coordination between proponent MSCs on separate subsystems or components of a single weapons system. It is also confusing to the contractor who has to deliver LSA data to the separate proponent MSCs. • The Army is short 40% of its maintenance engineers, ILS managers and materiel management personnel needed to conduct adequate analysis of the tech data produced by contractors. • The current logistics system lacks discipline at both the wholesale and	through non-standard ad-hoc processes. • MIL-STD-1388-2B uses a relational database oriented LSAR ADP system which is a step closer to an interactive logistics database and should allow LSA to become a living process, rather than a process which ends when provisioning data is moved from LSAR to the PMR of CCSS. • Most automated logistics systems were designed and developed by the automators who were driven more by the technology of the day, rather than by the requirements of the logisticians. The result has been the automation of the manual process, not an improvement of the process itself.	• Updates/changes to LS data trails/lags changes in item configuration, resulting in operations and support personnel using "yesterdays data" for "todays problem". • LS data is no longer always procured in a purely sequential manner; rather it is often procured in a concurrent (concurrent engineering) or after-the-fact (NDI) manner. • The amount of LS data being procured is growing at an uncontrolled and unmanageable rate. The B-1 Bomber has over one million pages of tech data, and the M-1 tank is not far behind. • NDI procurement sometimes restricts the level of tech data procured which

ORGANIZATION	PROCESS	DATA
retail level. Rules and policies exist but they are not enforced or enforceable. • Modern LS systems lack state-of-the-art technology that is focused on reducing and eliminating opportunities for failure within the system. Technology innovations are slow to insert/ implement, preventing increased system effectiveness and additional cost savings. • There exists embedded "cultural" obstacles that must be overcome to ensure a receptive and timely implementation of the modernized LS system. The large institutionalized LS infrastructure and the operational and cultural mindset of the people operating the system will hamper the modernization of the LS system.	• The Materials and Parts Availability Control Program Information Data System (MIDS) program focuses on the automated on-line parts information using a system of network databasing, intelligent gateway techniques, and problem solving algorithms. It ties Army and AMC MSC databases together to provide user information on different LS type parts data and can be used to display TM data. • LS model factors are not updated as often as they should be. Many of todays most used LS models utilize outdated factors which affects readiness.	affects the overall logistics support of an item. • The DoD MODELS program will have considerable impact on the Army's logistics tech data and how it is transferred within the system. • Standard LS data elements and integration of LS databases would allow the consolidation of LS functions and locations. • The current system contains considerable historical data; however, it is not fully utilized. For example, the Army is not using on-hand demand data contained in the SIM-X and CDDB databases to update demand rates and compute stockage levels. • LS data is contained in a series of stovepipe systems at both wholesale and re-

ORGANIZATION	PROCESS	DATA
		tail level. LS data is not shared between systems, and there is a duplication of LS data within the Army, DLA, and other services.

CONCLUSIONS - LOGISTICS SUPPORT

ORGANIZATION

- Automating LSA data records would reduce the workload within the PMs and MSCs and enable MSC functional organizations timely access to data from PMs and other MSCs on their development items and on other weapon systems.

- Standardizing the organizational structure within the MSCs would improve LS data management throughout the MSCs and would significantly reduce the coordination difficulty between the MSCs. It would also significantly reduce confusion on the part of the contractor in delivering LSA data to several MSCs that are under the same contract.

- Consistent LS planning and system development procedures among the MSC's, at the MSC-PM

PROCESS

- LS data standards should be developed and implemented to aid and discipline the configuration control process.

- The LS specification and definition process would be strengthened by emphasis in early systems reviews on adequate data requirements definition.

- The DoD MODELS program must be fully integrated into the Services logistics process and automation initiatives to insure compliance and standardization of logistics data throughout DoD.

- The MIDS program offers the opportunity for CALS to expand its automated transfer of LS data.

- Because concurrent engineering among contractors and NDI are becom-

DATA

- Extension of standardization of structure and media to field commands and locations would facilitate the mutual exchange and sharing of significant logistics and readiness data.

- Standardization of media, transmission and storage methods in an electronic/digital form would improve access to and provide a more efficient use of LS data.

- Standardization of automation applications and equipment used in LS data processing among PMs, MSCs and contractors would enable more effective LSA data storage, retrieval, manipulation, updating, and comparison.

- Use of Weapon System LS data generated by the user (failure data, supply demand rates, etc.) would

ORGANIZATION	PROCESS	DATA
internal matrix interface, and their external interfaces with the contractor would aid coordination and efficiency.	ing a prevalent way of business today, the ILS manager must get involved earlier in the weapon system development life cycle to ensure timely and early review of contractor produced tech data. • The logistics process/ function should be reviewed for change in light of the subsequent reduction in tech data generated by those processes/ functions. • The use of expert systems and AI in the review, acceptance and management of LS data will reduce the impact of personnel shortages, and improve R&M of weapon systems.	greatly improve accuracy of re-provisioning and avoid future excess inventories. • Timely acquisition and update of weapon system PD and LS data is key to successful logistics support. Standardization in cataloging and accuracy of initial provisioning will reduce unnecessary/excess stocks. • Field generated LS data residing in the existing databases (SAMS, CBS-X, etc.) can be integrated with the wholesale databases (CCSS, SDS, etc.) to create a more effective and efficient logistics system. • An integrated LS data base which allows on-line access to government (combat and materiel developer) and contractor ILS

ORGANIZATION	PROCESS	DATA
	• Use of sophisticated processing techniques for comparing parts description data (numerical and graphic) would help the cataloguer prevent the purchase and proliferation of duplicate parts, and could eventually reduce the volume of items in the catalog by an order of magnitude.	and engineering personnel would reduce the requirement for off-site reviews such as ILSMT and LSAR review team meetings and program reviews. • LS modernization should start with the identification of an Essential Elements of Logistics Information (EELI). Distribution Architectures that will allow multiple system interaction should be developed, with standardized security safeguards incorporated into the design. A common user-system interface architecture that details (transparent) systems operations/interactions between users and distributed networking systems should be developed for future large integrated computer systems.

ORGANIZATION	PROCESS	DATA
		cess to government (combat and materiel developer) and contractor ILS and engineering personnel would reduce the requirement for off-site reviews such as ILSMT and LSAR review team meetings and program reviews.
		• LS modernization should start with the identification of an Essential Elements of Logistics Information (EELI). Distribution Architectures that will allow multiple system interaction should be developed, with standardized security safeguards incorporated into the design. A common user-system interface architecture that details (transparent) systems operations/interactions between users and distributed networking systems should be developed for future large integrated computer systems.

Evolutionary Improvement to Army LS Management

	3-5 YEARS	7-10 YEARS	10-20 YEARS
	What Information Technologies Could Enhance The Logistic Processes?		
LS	Increased definition, standardization of LS data elements; data architecture defined Some expert systems, AI emerge in LS process for tailoring LSA/LSAR requirements and review of LSAR submissions(e.g., LOGPARS) Concurrent Engineering practices begin to be defined and "prototyped" in newer programs	Standard "digitized" LS data format submitted by prime contractors via on-line EDI Databases promote *shared* LS data access Armywide; e.g.,TRADOC, OSD, Field LSA/LSAR is standardized as a "Living Process" and maintained after fielding of weapon systems	Real time, accurate and timely LS data is shared via integrated weapon system databases; automated feedback to design Most contractors communicate LS data via standard EDI format to government and to other contractors
	What LS Process Improvements Are Possible Through The Application Of Information Technology?		
LS	MIL-STD 1388-2B begins to be implemented for interactive LSAR DB Interactive LSA data records reduce PMs and MSCs workload and provides MSCs with timely access to other PMs and MSCs data on development items and other weapon systems	EDI of Field Readiness and SDC data fed into LS DB LSAR becomes living process by linkage to post-fielding LS DB; fielded data input Combat developer has access to MSC and Contractor LS DB	Smart systems allow relevant, concise levels of tech data (level I,II,III,etc.) to facilitate logistics operations (provisioning, maintenance planning); Promotes JIT logistics; Concurrent Engineering ECPs, MODs, etc. are communicated and/or updated throughout shared databases in real time
	How Can The Army Achieve These Logistics Process Improvements?		
LS	Continue definition, standardization of LS data elements; data dictionary Promote use of expert systems in LS process where applicable Continue to implement MIL-STD 1388-2B	Complete implementation of standardized digital transfer of LS data between Prime Contractors and Army organizations; Automate DBs to promote *shared* LS data access Army-wide; e.g., TRADOC, AMC, Field Army Weapon System performance is data is automatically reported and used to improve weapon system design and readiness	Implement applications of automated reviews and checks for standards, compliance, and log support feasibility and cost Complete integration of LS data into heterogeneous processing environments as applicable Complete on-line LS applications using logically integrated DBs

Appendix A:
Acronyms and Abbreviations

Appendix A

Abbreviations and Acronyms

AAE	Army Acquisition Executive
AI	Artificial Intelligence
AMC	Army Materiel Command
AMCCOM	Armaments, Munitions, and Chemical Command
AMDF	Army Master Data File
AMIM	Army Modernization Information Memorandum
AMSR	Automated Microfilm Storage and Retrieval
AP	Acquisition Plan
APPS	Automated Printing Publishing System
ARDEC	Armaments Research Develop and Engrg Command
ARNG	Army National Guard
ASA-FM	Assistant Secretary of the Army (Financial Mgmt)
ASA-I&L	Assistant Secretary of the Army (Installation and Logistics)
ASA-RDA	Assistant Secretary of the Army (Research, Development, and Acquisition)
ASL	Authorized Stockage List
AVSCOM	Aviation Systems Command
BOIPFD	Basis Of Issue Plan Feeder Data
CCB	Configuration Control Board
CCSS	Commodity Command Support System
CDA	Catalog Data Agency
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CECOM	Communications-Electronics Command
CFP	Concept Formulation Package
CIM	Computer Integrated Manufacturing
CMP	Configuration Master Plan
COE	Corps of Engineers
CONTR	Contractor
CSDA	Central System Design Activity
DCAS	Defense Contract Administrative Service
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff Operations
DESCOM	Depot Systems Command
DI	Data Interchange
DID	Data Item Description
DMSP	Depot Maintenance Support Plan

DMWR	Depot Maintenance Work Requirements
DRRB	Data Requirements Review Board
DSREDS	Digital Storage and Retrieval of Engineering Drawings System
ECP	Engineering Change Proposal
ECR	Equipment Change Request
EDI	Electronic Data Interchange
EIR	Equipment Improvement Recommendation
EOPD	Equipment Oriented Publication Data
EUSA	Eighth United State Army
FDM	Functional Data Managers
FORSCOM	Forces Command
GOCO	Government Owned Contractor Operated
HQDA	Headquarters, Department of the Army
ILSMT	Integrated Logistics Support Management Team
ILSP	Integrated Logistics Support Plan
IPR	In Process Review
IPS-TL	Integrated Procurement System-Technical Loop
ISC	Information Systems Command
LABCOM	Labratory Command
LEA	Logistics Evaluation Agency
LIF	Logistics Intelligence File
LOA/LAP	Logistics Assistance Office/Logistics Assistance Program
LOGCEN	Logistics Center
LPSA	Logistics Program Support Activity
LS	Logistics Support
LSA	Logistics Support Analysis
LSAR	Logistics Support Analysis Records
LSART	Logistics Support Analysis Review Team
LSAP	Logistics Support Analysis Plan
MAC	Maintenance Allocation Chart
MACOM	Major Army Command
MJWG	MANPRINT Joint Working Group
ME	Maintenance Engineer
MFP	Materiel Fielding Plan
MICOM	Missile Command
MM	Materiel Realeas Order
MOD	Modification
MIL STDS	Military Standards
MRO	Materiel Management
MRSA	Materiel Readiness Support Activity
MSC	Major Subordinate Command
MSC-FDM	Major Subordinate Command-Functional Data Mgr
MSP	Mission Support Plan
MTMC	Military Traffic Management Command
MWO	Modification Work Order
NET	New Equipment Training
NETP	New Equipment Training Plan
O&M	Operations and Maintenance
O&OP	Operational & Organizational Plan
PD	Product Definition
PDES	Product Data Exchange Specification

PDP	Procurement Data Package
PDR	Preliminary Design Review
PEO	Program Executive Officer
PIP	Product Improvement Package
PLL	Prescribed Load List
PM	Program Manager
PMD	Program Management Directive
PMP	Program Management Plan
PP	Production Procurement
PPBES	Planning Programming Budget Execution System
PPI	Procurement Package Input
PRIMIR	Product Improvement Management Info. Report
PUBS	Publications
PWD	Procurement Work Directives
QDR	Quality Deficiency Report
QQPRI	Qualitative and Quantitative Personnel Req't. Info.
RFP	Request for Proposal
ROC	Required Operational Capability
RPDP	Re-Procurement Data Package
RPSTL	Repair Parts and Special Tools List
RQMTS	Requirements
RTDP	Re-Procurement Technical Data Package
SCH	School
SCS	Supply Control Studies
SDC-F	Sample Data Collection - Field
SDCP	Sample Data Collection Plan
SDMO	Specifications and Data Management Office/Officer
SDRB	Specification Data Review Board
SE	System Engineering
SMMP	System Manprint Management Plan
SOW	Statement Of Work
SPEC	Specifications
STRAP	System Training Plan
TAD	Target Audience Description
TAMMS	The Army Maintenance Management System
TD/CMS	Technical Data/Configuration Management System
TDP	Technical Data Package
TDPL	Technical Data Package List
TEA	Transportability Engineering Analysis
TACOM	Tank-Automotive Command
TECOM	Test and Evaluation Command
TEMP	Test Evaluation Master Plan
TIR	Test Incident Report
TIRS	Test Incident Report Summary
TM	Technical Manuals
TR	Transportability Report
TRADOC	Training and Doctrine Command
TSG	The Surgeon General
USA	Under Secretary of the Army
USAPPC	US Army Printing and Publication Command
USAR	US Army Reserve
USAREUR	United State Army Europe

APPENDIX B:
CONTROL DOCUMENT LIST

Appendix B

CONTROL DOCUMENT LIST

DoD Publications:

** DODISS ..... Department of Defense Index of Specifications and Standards

** DODD 4120.3 & DODD 4120.21 ..... Specifications and Standards Application

DODD 4245.6 ..... Defense Production Management

** DOD 5000.19-L ..... Acquisition Management Systems and Volume II Data Requirement Control List-AMSDL

*** DOD 5000.3-M-1 ..... Test and Evaluation Master Plan Guidelines

DOD 5000.39 ..... Acquisition and Management of ILS for Systems and Equipment

** DODI 5010.12 ..... Management of Technical Data

Military Handbooks, Specifications and Standards:

MIL-STD-12 ..... Abbreviations for Use on Drawings, Specifications, Standards, and in Technical Type Publications

* MIL-STD-335 ..... Manuals, Technical: Repair Parts and Special Tools List

** MIL-STD-480 & 481 ..... Configuration Control - Engineering Changes

** MIL-STD-483 ..... Configuration Management Practices

** MIL-STD-490A ..... Specifications Practices

** MIL-STD-499A ..... Engineering Management

** MIL-STD-961 ..... Military Specifications and Associated Documents, Preparation Of

** MIL-STD-1388-1A ..... Logistics Support Analysis and LSA & 2A Record

** MIL-STD-1456 ..... Contractor Configuration Management Plans

* MIL-STD-1790 ..... Data Requirements for Development, Acquisition, and Update of Technical Manuals

* MIL-M-63001(TM) ..... Repair Parts and Special Tools List

* MIL-M-63036(TM) ..... Manuals, Technical: Operators, Preparation of

* MIL-M-63038(TM) ..... For Preparation of: Manuals, Technical; Organizational, Direct Support and General Maintenance

** MIL-HDBK-245 ..... Preparation of Statement of Work

** MIL-HDBK-288 ..... Review and Acceptance of Engineering Drawing Packages

* MIL-HDBK-68038-1 ..... Technical Manual Writing Handbook

* MIL-HDBK-63038-2 ..... Technical Writing Style

** DOD STD-100 ..... Engineering Drawings Practices

Army Regulations:

AR 18-10 ..... Standardizing Data Elements and Codes to Facilitate the Interchange of Data within the Army Information and Data Systems and Others (being replaced by AR 25-series regs)

** AR 70-1 ..... Army Research, Development and Acquisition Policies and Procedures

AR 70-15 ..... Product Improvement of Materiel

** AR 70-37 ..... Configuration Management

AR 70-47 ..... Engineering for Transportability

AR 70-61 ..... Type Classification of Army Materiel

*** AR 71-2 ..... Basis of Issue Plans (BOIP), Qualitative and Quantitative Personnel Requirements (QQPRI)

AR 74-1 ..... US Army Participation in International Military RSI Programs

* AR 310-3 ..... Preparation, Coordination, and Approval of Department of the Army Publications

*** AR 350-35 ..... Army Modernization Training/New Equipment Training

*** AR 602-1 ..... Human Engineering

AR 700-15 ..... Packaging of Materiel

*** AR 700-18 ..... Provisioning of US Army Equipment

** AR 700-47 ..... Defense Standardization and Specification Program (DSSP)

** AR 700-50 ..... Development and Use of Non-Government Specifications and Standards

** AR 700-51 ..... Army Data Management Program(w/ AMC Suppl)(To be replaced by AR 25-9, The Army Data Standards and Management Program)

*** AR 700-60 ..... DOD Parts Control Program

** AR 700-70 ..... Application of Specifications, Standards, and Related Documents in the Acquisition Process

*** AR 700-82 ..... Source, Maintenance and Recoverability (SMR)

*** AR 700-89 ..... Identification, Control and Utilization of Shelf Life Items

AR 700-96 ..... Govern Interagency Requisitioning and Interchange of Data

AR 700-127 ..... Integrated Logistics Support

AR 702-3 ..... Army Materiel Systems Reliability, Availability, and Maintainability (RAM)

** AR 702-7 ..... Reporting of Product Quality Deficiencies Across Component Lines

*** AR 708-1 ..... Cataloging and Supply Management Data

*** AR 710-1 ..... Centralized Inventory Management of the Army Supply System

*** AR 710-2 ..... Supply Policy Below the Wholesale Level

AR 715-7 ..... Advance Validation of Technical Data Required for DSA Procurement

*** AR 725-50 ..... Requisitioning, Receipt, and Issue System

AR 750-1 ..... Army Materiel Maintenance Concepts and Policies

*** AR 750-37 ..... Sample Data Collection: The Army Maintenance Management System (TAMMS)

AR 750-43 ..... Test, Measurement and Diagnostic Equipment (TMDE)

AR 1000-1 ..... Basic Policies of System Acquisition

DA Pam 11-5 ..... Standards for Presentation and Documentation of Life Cycle Cost Estimates for Army Materiel Systems

AMC Regulations and Pamphlets

** AMC-R 70-46 ..... Technical Data Package Management Plan

AMC-R 700-15 ..... Integrated Logistics Support

AMC Pam 18-1 ..... Data Element Dictionary(to be revised IAW Army 25-series Regs)

Other Documentation

Army CALS Functional Anaysis	Final Army CALS Business Model and Baseline Technical Architecture Report January 20, 1989; CACI, INC.-FEDERAL
U.S. Army Strategic Plan for Logistic System Modernization-Foundation Analysis	Annex B: Logistics System Problems and Opportunities, 21 July 1989; CACI, INC.-FEDERAL, Final Report

Specific Application:

* Technical Manuals
** Product Definition
*** Logistics Support

Appendix C:
Content of Data Flows

Appendix C

CONTENT OF DATA FLOWS

In the Introduction at the front of this document there appears a Level 0 data flow diagram. It contains many data flows linking the weapon system technical information processes of Create, Manage, and Use to each other and to external entities which operate in the Army's business environment. In sections II and III, and appendix D (Product Definition, Logistics Support, and Technical Manuals, respectively), there appear matrices which identify specific items of technical data which the Army uses to plan, control and execute the process which create, manage and use technical information. This appendix presents a cross-reference list between the data flows of the Level 0 Diagram and the data items of the three data matrices: Product Definition, Logistics Support, and Technical Manuals. It is important to note that all of the data items from the matrices do not map to a specific data flow. This is true, and to be expected, because some data items are managed internally to a process only, and never flow between processess or between processess and external entities. Should the large scale processes of the Level 0 Diagram be further divided into more detailed processes in the future, it is likely that all data items from the matrices would become elements of the more detailed data flows that would result from this refinement.

DATA FLOWS	DATA MATRIX DATA ITEMS
• Specifications & Engrg Drawings	• Engineering Drawings • Specifications • System Diagrams • Level 3 Diagrams • Technical Reports • TDP Specs • Revised Engineering Data • Associated Lists • Engineering/Design Data • Cataloging Data
• LSA Records and Reports	• LSA Records • LSA Analysis Data

DATA FLOWS	DATA MATRIX DATA ITEMS
• Non-LSA Logistics Support Data	• LS Change Data • LS Data
• Engineering Change Proposal	• ECR • ECP • MWOs • Engineering/Design Data • Technical Reports • Engineering Drawings
• Technical Publications	• TAD • TM • Supply Bulletin • MWO • QQPRI • EOPD
• Weapon System Test Results	• Test Data • TIR
• Procurement Technical Requirements	• PDP • MOD • PWD • Other Contract Data • SOW • CDRLs • DIDs • O&O Plan • ROC • PMP • ILSP • LSAP
• Procurement Technical Data Package	• Configuration Control Practices, Procedures, and Standards • TDP • Specs • BID Sets • TDP/TDPL

DATA FLOWS	DATA MATRIX DATA ITEMS
• Government Furnished Technical Information	• LS Regs and Pubs • Configuration Data • NETP • LS Contract Guidance • MFP • AMDF • Cataloging data • SMMP
• Weapon System Life Cycle Technical Reviews	• Quality Control Reports • Safety Reports • TEA Data • LS Change Data • ILSMT & LSAR Review Team Data
• Initial LS Plans	• MFP • DMSP • NETP • BOIP • SDCP
• Initial Tech Pubs	• TMs • Supply Bulletins • MWO • DMWR • TAD • TM Verification Plan • Draft TM
• Initial LS Data	• LSA Records & Reports • ROC and O&O • BOIP FD • ILSMT and LSAR Review Team Data • LS Plans (ILSP, LSAP, etc.)
• Initial Engrg Drawings & Specifications	• Specifications • SOW, CDRL, DIDs, • Data Call
• Existing LS Data	• BOIPFD • AMDF • TAMMS/Readiness Reports • AMDF

DATA FLOWS	DATA MATRIX DATA ITEMS
	• CCSS Reports • LIF • Training Material • AMIM
• Existing Engrg Drawings & Specifications	• TDP Specs • Revised Engineering Data • CMP • Configuration Control Practices, Procedures, and Standards • PIP • Configuration Data • Engineering Drawings
• Existing Tech Pubs & Changes	• TM Updates • Catalog Data • Maintenance & Supply Regs & Pubs
• LS Data	• AMDF • TAMMC Data • Readiness Data • LAO/LAP Reports • SDC-F • MFP
• Engineering Change Request	• EIR/QDR • QA/QC Data
• TM Change Request	• TM Change (DA Form 2028) • TM Request (DA Form 12)

ADD FROM EXHIBIT I-1 (OTHER DOD)