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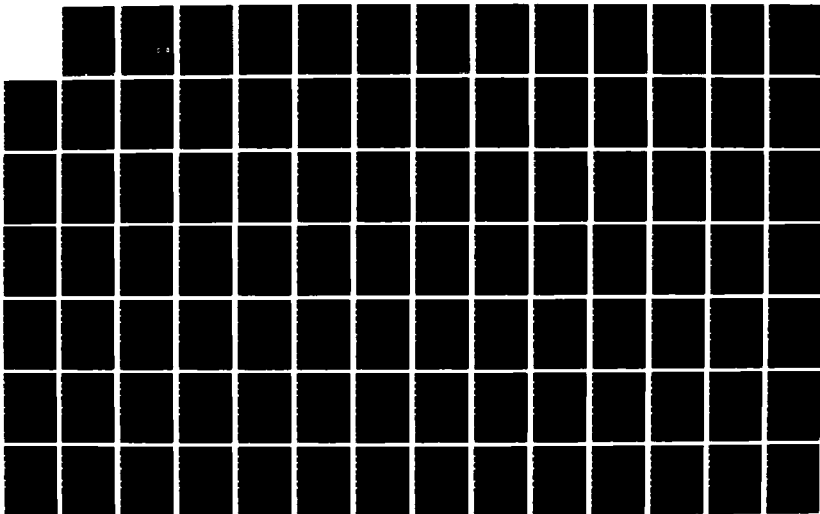
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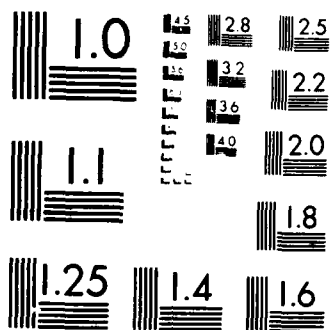
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PLANNING FOR INFORMATION
RESOURCE MANAGEMENT BY OSD

Report ML532R2

December 1987

Carl H. Groth, Jr.
William T. James, III
Sharon M. Murry

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The OSD spent \$60 million on information technology in FY87 and plans to spend more than \$100 million in FY89. The FY89 expenditure would become the largest component of the OSD budget. By the mid-1990s, OSD's staff members and managers will have access to decision support tools, libraries of databases, large-scale computational equipment, and telecommunication facilities – all from individual computer workstations. Because the costs are so high and the technology is advancing so swiftly, plans for management of information resources must be drawn up without delay. The issue for strategic planning is not whether this transformation will take place, but at what pace it will proceed and how efficiently. The challenge for OSD's senior managers is to develop a strategic plan to guide the transformation. We recommend a two-phase plan: In Phase 1, from now until FY90, existing office automation (OA) equipment in OSD is upgraded, groundwork is laid for an integrated OSD OA network, and computational hardware and software are provided for improving the preparation and execution of the DoD Program Budget.					
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Phase 2, from FY90 - 95, is to integrate decision support systems within the OA environment and establish communications links with other DoD and Federal information systems.

The plan addresses deficiencies in OSD's management of information technology:

- Systems are being procured without adequate planning for interoperability among OSD components.
- There is no consistent way to validate requirements for information resources and establish priorities for their use.
- There is no consistent way to make sure that information processing capabilities are being procured at reasonable cost.
- There is an inequitable and inefficient distribution of information technology among OSD components.
- Management of information and information technology resources is too decentralized.

As part of implementing the plan, we recommend that the Director of WHS take the following actions:

- To improve interoperability, enforce Open Systems Interface communications standards, in coordination with the renewed efforts to identify communications needs. In particular, we recommend that OSD follow the three-stage approach adopted in the Telecommunications Plan for DoD's Computer-Aided Acquisition and Logistics Support Program.
- Provide a forum within which Principal Staff Assistants directly participate in planning, programming, and requirement validation as a part of the larger OSD Planning, Programming and Budgeting System process.
- Issue a new Automated Information System Administrative Instruction that provides: (1) guidelines for information technology requirements analyses and validation and (2) contracting procedures, including standards for acquiring information processing capabilities.
- In future acquisitions, place a priority on increasing the distribution of minimum essential technology instead of increasing the sophistication of information processing for a few organizations.
- Evaluate the potential for improved information resource management via consolidation of the Directorates for Information Operations and Reports, Computer and Office Automation Resources, and Correspondence and Directives into a single Information Resources Management directorate.

OSD can benefit from the new OA environment -- but only if senior executives plan with care and imagination. The two-phase plan recommended here can help.

Executive Summary

PLANNING FOR INFORMATION RESOURCE MANAGEMENT BY OSD

The OSD spent \$60 million on information technology in FY87 and plans to spend more than \$100 million in FY89. The FY89 expenditure would become the largest component of the OSD budget. By the mid-1990s, OSD's staff members and managers will have access to decision support tools, libraries of databases, large-scale computational equipment, and telecommunication facilities – all from individual computer workstations. Because the costs are so high and the technology is advancing so swiftly, plans for management of information resources must be drawn up without delay.

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SECTION 1

INTRODUCTION

1.1 DEFINITION AND PURPOSE.

OMB Circular No. A-130, *Information Resources Management*, defines information resources management (IRM) as the planning, budgeting, organizing, direction, training, and control associated with creation, collection, processing, transmission, dissemination, use, storage, and disposition of information, both automated and nonautomated.

This IRM Planning Report has three main purposes:

- To describe the IRM process for OSD
- To evaluate IRM processes and acquisition of current information technology hardware and software against present commitments
- To present a 5-year (FY88 – 92) plan for applying information technology to support of OSD mission goals.

IRM is important to OSD for two reasons:

- Budgets of OSD information systems have become substantial (totaling approximately \$100 million a year by FY88 – 89).
- Information is critical to OSD missions.

1.2 SCOPE OF THE PLANNING REPORT.

This plan provides IRM goals and objectives, specifies the OSD commitments and plans for using information technology resources, and evaluates how well OSD is presently applying these resources to achieve IRM goals. It describes a strategy and methods for accomplishing the goals and objectives within the next 5 years, presents a target information architecture, and recommends a program review process that OSD can use to update this plan each year.

1.3 ORGANIZATION AND USE OF THE PLANNING REPORT.

In establishing an approach to developing an IRM strategic plan for OSD, the salient factors involved in IRM planning have been identified. This report presents these key elements as follows:

- *Section 2 – The IRM Process.* The Directorate for Computer and Office Automation Resources (DCOAR) and the IRM Steering Committee agreed on initial IRM goals and objectives. These define the direction toward which managers of OSD information technology should aim and provide a basis against which the effectiveness of that management can be evaluated. The section presents the OSD goals and objectives and discusses the IRM planning environment.
- *Section 3 – Present Commitments and Plans.* Budget data submitted by OSD components, representing their information resource requirements, provided a baseline of OSD information technology for both extant and planned systems. This section describes the present state of IRM planning in OSD and OSD's technology base.
- *Section 4 – Evaluation.* This is OSD's first formal IRM Plan and it should be borne in mind that much of the present information technology commitments and plans preceded the establishment of agreed-on IRM goals and objectives. Nevertheless, this section presents an evaluation of how well actual management direction tracks the stated goals and objectives. It examines the IRM process and OSD's application of information technology in FY88 and gauges the degree to which these comply with stated goals and objectives.
- *Section 5 – The 5-Year Information Resource Management Plan.* Specific recommendations to better align OSD plans and commitments with its goals and objectives through procedural and organizational changes are specifically incorporated into this strategic plan. Through these recommendations, this section guides the development and acquisition of information technology in OSD in FY88 – 92.

As a vehicle to assist in the effective management of OSD's information technology, the 5-year IRM Plan is viewed as a continuing program. With the passing of each fiscal year, the IRM planning window also extends another year into the future. The match between IRM goals and objectives and ongoing OSD plans and commitments needs to be monitored continuously. OSD IRM planners should develop and adopt annual recommendations that modify either the goals and

objectives or the plans and commitments to bring them increasingly into greater alignment.

The appendices to this Report contain information in support of the five sections previously described and are organized as follows:

- *Appendix A – Information Resource Management: Authority and Organizations* describes the policies, directives, and organization that govern the management of information.
- *Appendix B – IRM Program Management* describes the organization, structure, and responsibilities for IRM management in OSD.
- *Appendix C – IRM and OSD Mission and Organization* describes the mission and organization of OSD.
- *Appendix D – OSD Information Technology* discusses the major elements of the OSD technology baseline in more detail than the description in Section 3 and provides information about significant automated information system (AIS) projects and corporate databases in OSD.
- *Appendix E – OSD Information Programs, Projects, and Sponsors* describes individual OSD IRM projects and the information programs under which projects are grouped. It also identifies FY87 and FY88 funds earmarked for each project.
- *Appendix F – How to Prepare Project Requests and Documentation for Automated Information Systems* provides guidelines for preparing project requests and supporting documentation for OSD AISs.
- *Appendix G – Computer-Aided Acquisition and Logistic Support (CALS)* describes the CALS program.

SECTION 2

THE IRM PROCESS

2.1 IRM PLANNING ENVIRONMENT.

The IRM planning environment includes the authority, organization, and goals for managing information resources. Additional information about the IRM planning environment appears in Appendix A.

2.1.1 Planning Authority and Organization.

OSD IRM planning authority is established by four documents:

- Office of Management and Budget (OMB) Circular A-130, *Management of Federal Information Resources*
- *Federal Information Resources Management Regulation (FIRMR)*
- DoD Directive (DoDD) 7740.1, *DoD Information Resources Management Program*
- DoDD 7740.2, *Automated Information System (AIS) Strategic Planning*.

These documents require the designation of a senior official to carry out IRM responsibilities, make program managers responsible for acquiring the information resources they need to support their missions, and emphasize the relationship of improved management of information activities to agency missions. The directives also provide guidance for planning, programming, budgeting, and acquiring information resources.

2.1.2 DoD IRM Goals.

DoDD 7740.1 established IRM goals for DoD, setting the general direction for OSD goals and objectives. The DoD goals are:

- Improve DoD mission operations and decision-making through effective and economical development and use of information.
- Integrate DoD information management activities through uniform and consistent plans, programs, policies, and procedures.

- Acquire and use information technology to improve mission effectiveness, productivity, and program management.
- Strengthen life-cycle management of information systems.
- Foster general awareness of the value of information and of the costs associated with it.

2.2 OSD IRM GOALS AND OBJECTIVES.

IRM goals and objectives are developed jointly by DCOAR and the OSD component Managers for Computer and Office Automation Resources (MCOARs), and approved by the Director of Washington Headquarters Services (WHS) and OSD component executives. IRM goals are the highest level statements of how information resources will support OSD missions. The objectives cite specific results to attain.

Goal 1: Provide the AIS Resources Needed for Maximum Productivity by the OSD Staff.

Objective 1.1: Satisfy general requirements of the OSD staff for office automation (OA)¹ information processing capability. Set up enough workstations in or near members' staff work areas to meet the needs of users.

Objective 1.2: Satisfy decision support system (DSS)² requirements within and across OSD components. Provide OSD with adequate levels of decision support capabilities. Where feasible, integrate DSS and OA system requirements.

Objective 1.3: Satisfy requirements for large- and medium-scale computational resources within and across OSD components. Provide appropriate levels of access within OSD. Where feasible, integrate these requirements with OA and DSS resources.

Objective 1.4: Automate distribution of messages between the Joint Chiefs of Staff (JCS) Information Services Center and OSD directorates.

¹Mid-1980s OA technology is here defined as the integration of fully functional word processing of the nature of Multimate, Wordperfect, or Wordstar with database management and spreadsheet software — all capable of being used in a multiuser local-area network (LAN).

²A DSS is a computer-based system that improves the capability of managers to choose among alternatives by offering them a flexible means of collating and displaying data and of using those data in the analysis of both structured and unstructured problems.

Goal 2: Improve Access to Corporate Data through Intercomponent Networking Via Gateways and Other Channels that Share Resources among OSD Components.

Objective 2.1: Identify information processes and supporting data sets that are common to more than one OSD user or to OSD and the Joint Staff.

Objective 2.2: Develop communications standards and gateway³ guidelines for providing OSD with access to non-OSD databases and networks.

Objective 2.3: Develop an OSD network strategy and schedule for interconnectivity among:

- Workstations within offices
- Workstation clusters or local-area networks (LANs) within each component
- Component LANs across OSD
- OSD network with the Joint Staff, the Military Departments, and Defense agencies.

Objective 2.4: Establish criteria for deciding how to manage the corporate data identified from Objective 2.1.

Objective 2.5: Establish an OSD Corporate Data Management Plan that describes how corporate data will be collected, maintained, and distributed.

Objective 2.6: Develop an information resources directory for all information technology systems and databases used by OSD components and the JCS, to be made available to all OSD components.

Goal 3: Make Sure that AISs Provide Necessary Levels of Security.

Objective 3.1: Establish information systems that comply with DoD standards for secure communications within OSD.

Objective 3.2: Establish an OSD TEMPEST standard that implements the DoD "burden of proof" policy, that is, not requiring TEMPEST standards unless a specific need is demonstrated.

³The term "gateway," as used throughout this report, refers to any hardware and software used to provide interconnectivity between different systems.

Objective 3.3: Comply with trusted computer⁴ software standards when establishing OSD information systems.

Objective 3.4: Establish OSD information systems so as to comply with DoD standards for multilevels of secure processing.

Goal 4: Make Sure that Advanced Technology is Used When Appropriate to Achieve Mission Goals and Reduce Costs.

Objective 4.1: Identify new AIS technologies and analyze their applicability to DoD needs.

Objective 4.2: Analyze and test prototype LAN interfaces and protocols to improve OA compatibility.

Goal 5: To Reduce Cost, Plan for and Manage the Acquisition and Operation of AISs.

Objective 5.1: Establish 5-year strategic AIS IRM plans for OSD and for every OSD component.

Objective 5.2: State, within Administrative Instruction No. 56 (AI56), a centralized approach and a process for OSD AIS IRM planning, programming, and budgeting.

Objective 5.3: Within AI56, state guidelines and component-level quality-control procedures for:

- Adequate requirements analysis and justification
- System life-cycle management with cost amortization
- Exploration of market alternatives
- Benefit-cost analysis that incorporates information technology costs with other costs to site, operate, and maintain an OA system.

⁴The term "trusted computer" is used here in reference to software that has been sufficiently safeguarded against the loss, alteration, or unauthorized access to data or processes in a system as a result of deficiencies in software.

2.3 IMPLEMENTATION.

2.3.1 IRM Program Management.

Four WHS directorates are responsible in OSD for performing the tasks associated with IRM. They are:

- *The Directorate for Computer and Office Automation Resources.* DCOAR is the OSD Information Technology Manager, responsible for providing computer services and associated support to OSD, including validation of automatic data processing (ADP) requirements, management and control of ADP resources, systems development and operation, and the provision of consulting services (DoDD 5110.4).
- *The Directorate for Information Operations and Reports (DIOR).* DIOR is the OSD Information Manager, responsible for providing a central data service to accumulate data and to provide reports and related analysis and evaluation (DoDD 5118.3). DIOR maintains over 30 statistical databases and is also responsible for reports management, forms management, and data standardization.
- *The Directorate for Real Estate and Facilities (DREF).* DREF is responsible for computer security and physical security (DoDD 5110.4).
- *The Directorate for Correspondence and Directives (DC&D).* DC&D is responsible for management of records and micrographic resources (DoDD 5110.4).

The role of information technology facility⁵ for OSD has been filled primarily by four organizations. They are:

- *DCOAR.* DCOAR provides the OSD unclassified administrative network and network resources.
- *Air Force Communications Command's Seventh Communications Group (7CG).* The 7CG has traditionally supported many OSD requirements for large computing resources.
- *DIOR.* DIOR manages the computer facility which supports the DIOR statistical databases.

⁵The term "information technology facility" means an organizationally defined set of personnel, hardware, software, and physical facilities, a primary function of which is the operation of information technology (OMB Circular No. A-130, p. A-3).

- *Office of the Assistant Secretary of Defense (Comptroller) [OASD(C)]*. OASD(C) manages a secure network that supports the Program Budget System.

Other components, such as the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) [ASD(C3I)], and the WHS Directorate of Budget and Finance (BF), have large internal computing capabilities that support their own requirements.

2.3.2 The IRM Program.

DCOAR began a comprehensive IRM planning process in late 1985. An IRM planning, programming, and budgeting system (PPBS) and an organizational structure were developed by mid-1986. This was in response to the need for more careful management of rapidly escalating AIS costs and a congressional mandate to raise the management of information resources to a level of visibility that was previously limited to personnel and major weapon systems.

The IRM process consists of two phases of activity by two management echelons. Figure 2-1 shows two of these phases that cover the planning, programming, and budgeting. Phase 1 includes planning and programming processes that are designed to produce an IRM plan and to establish priorities to guide budget activities. Phase 2 involves budget activities, including budget estimation and issuance of budget guidance emanating from development of the DoD budget and subsequent budget legislation. Implementation of information activities occurs throughout the year; it covers the acquisition of information resources, including developing an acquisition strategy, and contracting, planning for, and managing system installation.

The management echelons depicted in Figure 2-1 identify organizational responsibilities for policy guidance, planning coordination, and program and project implementation. The Director of WHS provides IRM program, policy, and budget guidance. A recent innovation is the formation of an IRM Steering Committee to assess OSD's overall information processing needs and provide MCOARs with guidance in their evaluation of information project priorities. The IRM Steering Committee comprises selected MCOAR and DCOAR members and provides staff-level coordination, program identification, and recommendations for resource allocation.

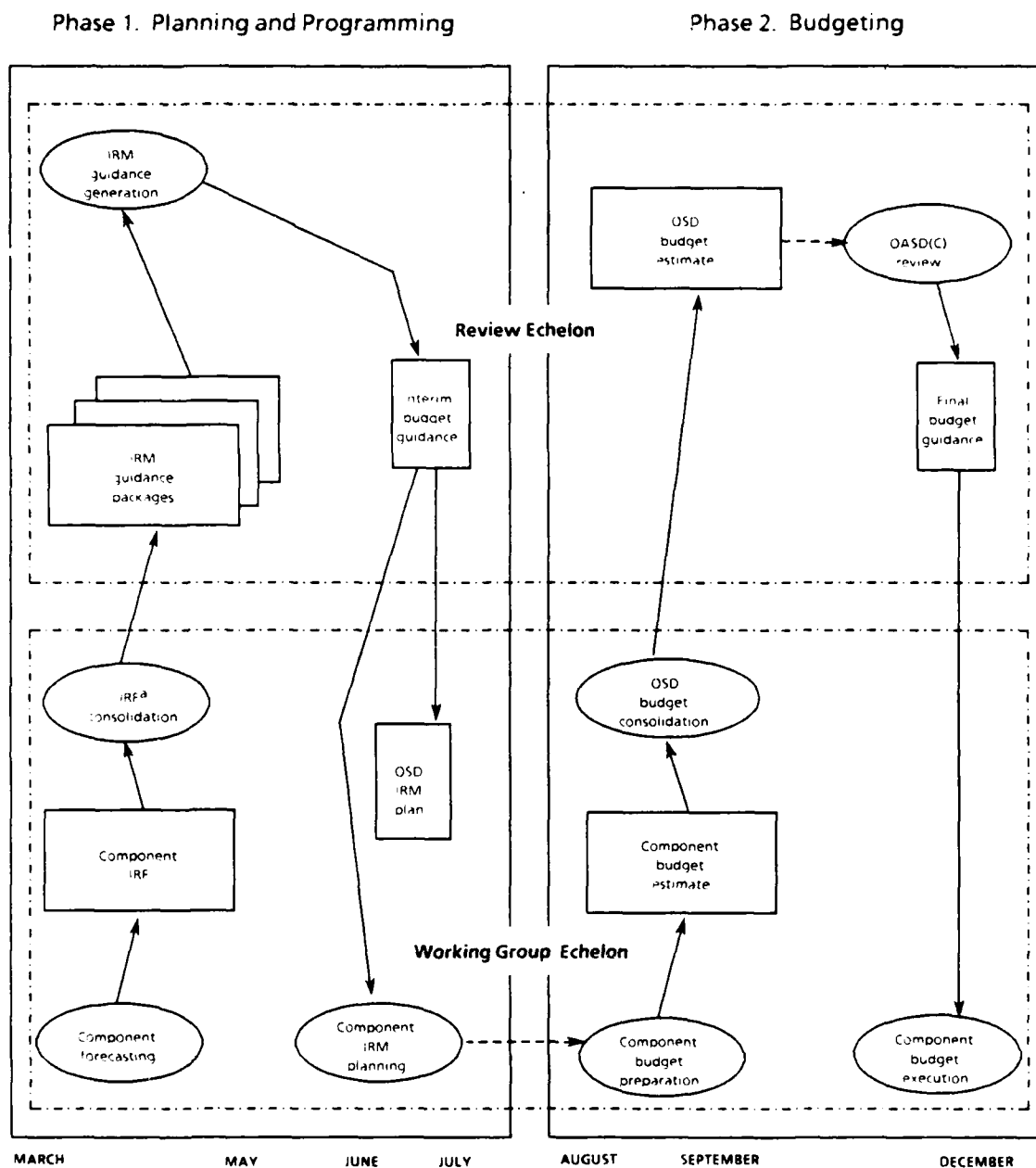


FIG. 2-1. OSD IRM PROCESS

The MCOARs are responsible for their project activities and priorities and for final allocation of their budgeted funds to support their component functions. DCOAR is responsible for providing the component managers with general support, to ensure efficient sharing of resources and promote effective application of new

technologies. Additional information about IRM management in OSD is contained in Appendix B.

In 1986, DCOAR and the MCOARs established major information programs reflecting the principal areas of processing activity that consumed considerable resources. In the FY87 budget, projects were grouped by these IRM program areas. During the fiscal year, DCOAR and the MCOARs realized that, although the IRM programs were convenient for describing project aggregates to Comptroller budget examiners and congressional staff, current program areas reflected an unsatisfactory mixture of mission-function support and technology initiatives.

In response to this shortfall, the IRM Steering Committee has assisted DCOAR in realignment of IRM projects with OSD's IRM goals and objectives. These goals and objectives were established earlier for managing the OSD IRM program (see Section 2.2). OSD projects will continue to be grouped into programs for the budget process.

2.3.3 IRM Linkage to Missions Supported.

A fundamental principle of IRM program management is the linking of information resources and activities to OSD mission functions they support. The OSD mission and organization are described in Appendix C. The following mission functions are described in the appendix:

- *OSD missions* are broad statements of OSD's purposes.
- *OSD mission goals* must be met so that OSD can carry out its mission. They are derived from and support OSD missions.
- *Component-mission functions* are component-level tasks that must be performed so that goals can be achieved.

Component-mission functions are supported by an information project or set of projects. An information project provides for management of a specific set of resources aimed at providing information processing applications needed to fulfill the component mission function. Figure 2-2 shows the linkage from an example mission goal through its mission function to the resources in a specific project.

The PPBS is designed to get components to analyze in the planning stages how well resources are applied to support their functions, to program projects that will provide their functions with adequate support, and to budget for the funds to acquire

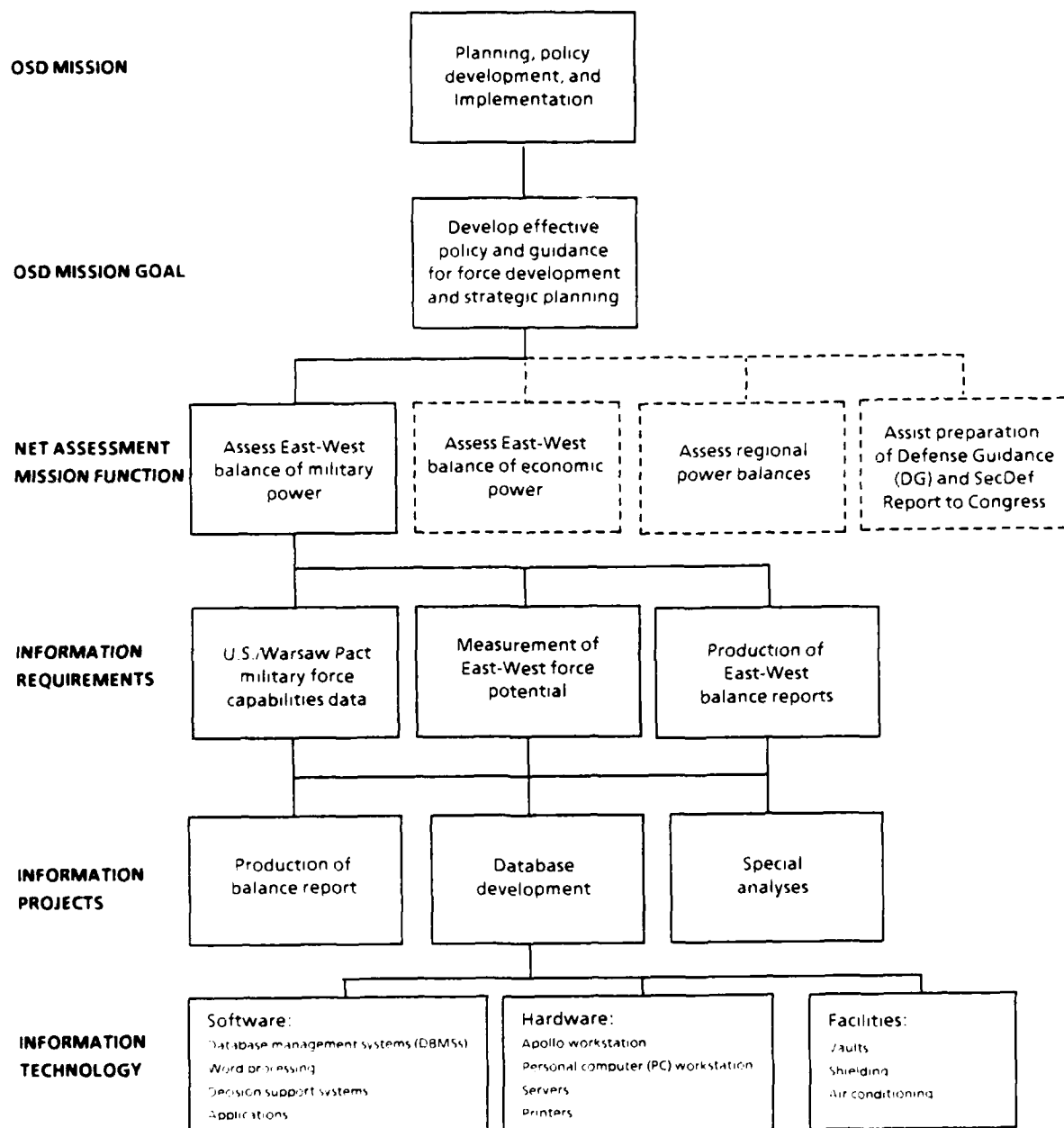


FIG. 2-2. MISSION LINKED TO INFORMATION SYSTEM REQUIREMENTS AND SUPPORTING TECHNOLOGY

the resources they need. In the programming and budgeting phases, component projects are analyzed by OSD IRM managers to determine the cost-effectiveness of the support they give the overall OSD mission.

The recent establishment of the Office of the Undersecretary for Acquisition [OUSD(A)], with responsibility for a number of functions that were previously managed by assistant secretaries and directors reporting directly to the Secretary of Defense, has created potential for some realignment of organizational roles and missions in the short run. This instability in such a significant portion of OSD will delay the ability of IRM planners to establish clear-cut linkages between information resource activities and organizational mission goals. This instability may be exacerbated by much broader organizational changes that are being recommended by OSD management reviews required by the Goldwater-Nichols DoD Reorganization Act of 1986 (Public Law 99-433, October 1, 1987). Despite the organizational changes, information resource managers can provide for their own continuity of effort by focusing on IRM goals and objectives that are not significantly affected by how organizational functions are allocated within OSD.

SECTION 3

PRESENT COMMITMENTS AND PLANS

3.1 INFORMATION TECHNOLOGY BASELINE.

3.1.1 Overview of Information Technology Baseline.

OSD AIS systems are undergoing rapid growth, from the small technology baseline of 1984 to a sophisticated processing environment envisioned for FY90. The 1984 baseline consisted of many different kinds of dedicated office word processors and a limited number of data-intensive specialized applications, largely supported by data processing resources outside OSD. OSD's total expenditures for all nonpersonnel information technology resources have grown more than tenfold in 6 years – from less than \$10 million in 1984 to more than \$100 million in FY90.

It is no surprise, then, that the OSD architecture at the middle of this 1984 – 90 period is a generally unconsolidated collection of individual component systems that have evolved in response to the mission needs of individual components. The technology baseline on which an architecture can be built is present, but individual elements have not been integrated into a specific structure adequate to serve OSD's information processing needs.

These are the major elements of the OSD information technology baseline:

- *Office Automation Workstations.* The following are the primary types of workstations in OSD: word processors, personal computers, and terminals that are linked to the 7CG computers. Word processors and personal computers are placed in the work areas of primary users and most 7CG terminals in classified processing sites near the users' work areas.

The majority of secure office automation work is produced on Xerox 8010 workstation clusters, standalone microcomputer stations that include IBM and Zenith PCs, and standalone dedicated word processors manufactured by Lanier, CPT, and Lexitron. Some of the minicomputer and mainframe systems whose principal function is data processing, including IBM 3800 and 4300 series and VAX 11-780, also provide office automation services.

Unclassified work is produced on Datapoint, Xerox, Convergent Technology (CT), and Wang workstations; a number of standalone PCs (IBM, Zenith, Compaq, Apple); a variety of minicomputers (Honeywell, Burroughs, Prime, and VAX), each of which is usually dedicated to supporting particular OA functions for a single component; and a few mainframe computers that perform administrative support functions.

The most pervasive influence of information technology on OSD over the past few years has been the replacement of dedicated word processing systems with new OA systems to improve support for idea processing, research, analysis, and drafting by professional staff members and managers. New OA systems support professional functions, as well as traditional word processing.

- *Local-Area Communications.* Implementation of local-area communications in OSD is undeveloped; however, OSD networks and communications links do perform several functions, and there is widespread user demand for growth in this area.
 - ▶ Internal LANs provide communication within a component. For example, the OASD(C) LAN, which supports the Program Budget system, connects OASD(C) personnel to printing, computing, and storage facilities. In addition, it provides electronic connections for administrative clerical support and other ADP functions.
 - ▶ A few newly developing LANs – for instance, the Ethernet and the Arcnet – provide communication among OSD components and between OSD and some outside organizations.
 - The Xerox Ethernet, managed by OASD(C), supports classified processing. The OASD(C) LAN has evolved around multiple Ethernet LANs that run Xerox Network Services (XNS)¹ protocols supporting Xerox workstations and processors within OSD components. The Ethernet supports more than 600 users. Major OSD users are OASD(C); Directorate, Defense Research and Engineering (DDR&E); Office of the Under Secretary of Defense for Policy [OUSD(P)]; and Directorate, Program Analysis and Evaluation (DPA&E). Near-term planning for this network includes integration of the existing LANs into one secure network, using end-to-end encryption to support intercommunications among all OSD users. In addition, the secure network capability will provide automation support for various command, control, communications, and intelligence activities. Classified and unclassified

¹XNS is the protocol that supports full interoperability of OA products produced by Xerox.

correspondence and electronic communications will be routed through the LAN facilities.

- The Datapoint Arcnet, managed by DCOAR, supports unclassified processing for more than 400 users. Major users are WHS, the DoD Inspector General (IG), and the Office of the Assistant Secretary of Defense (Public Affairs) [OASD(PA)]. Other OSD components use the Arcnet primarily to access the OSD Correspondence Control System. DCOAR is developing a concept for a system to replace the Arcnet. It includes a broadband, backbone cable that links OSD component LANs and is capable of handling all forms of information. Gateways will be used to connect users with other networks and external systems.
- OSD has awarded to Electronic Data Systems an open-ended contract to provide a third major network and compatible OA equipment, the Office Automation Computer System (OACS). The network which will run Transmission Control Protocol/Internet Protocol (TCP/IP) is intended to support present users of Sun and Lanier equipment. The size of the new network will be determined by how well the OA provided by the contract satisfies user requirements.
- ▶ The secure links of the 7CG provide communication between OSD classified sites and the 7CG computer facilities; 7CG dial-up capabilities provide unsecure telephone links to 7CG computers.
- ▶ The JCS Information Services Center plans to electronically transmit JCS messages that arrive at the Pentagon Telecommunications Center to the OSD Directorates to whom they are addressed.
- *Wide-Area Communications.* Wide-area communications capability is less developed in OSD than are local-area communications, and there is a similar user demand for expansion of services. OSD components communicate with organizations and databases outside the Pentagon in a variety of ways. Message processing and secure voice transmission capability are provided through the JCS Information Services Center. Some components subscribe to the Defense Data Network (DDN) and the Defense Research and Development On-line System (DROLS). Others communicate from terminals, either linked to their LANs or installed specifically to communicate with external databases. The latter is the more common form of external communication.

So that OSD users may access needed data and computing capabilities from their work areas, OSD components are installing and enlarging networks and are considering software conversion and gateways to promote access via

networks with dissimilar communication protocols. Gateways are being addressed in two ways:

- ▶ Some components, for example, the Office of the Assistant Secretary of Defense (Reserve Affairs) [OASD(RA)], are planning gateways between their individual component LANs and other systems.
- ▶ DCOAR is researching gateway techniques and technology and now plans to develop gateways among major OSD LANs, and between OSD and other agencies. The Defense Technical Information Center (DTIC) is working with DCOAR to establish a Defense Gateway Information System (DGIS) to support multiple DoD users including OSD.
- *Large-Scale Computing Resources.* The 7CG is the principal data processing facility supporting OSD requirements for large-scale computing. Its MULTICS system holds more than 20 large, classified OSD databases, including the major OSD Five Year Defense Plan (FYDP) corporate database, and runs many analytical models for OSD components. Its classified IBM system provides for full-text search and retrieval of speeches by Secretaries of Defense and supports many other OSD applications. Other 7CG computers support unclassified database applications for OSD.

The 7CG MULTICS system is being replaced at a time when OSD component requirements for large databases and models are increasing. Even after MULTICS is replaced, 7CG cannot satisfy all OSD demands for its services. For this reason and because of increasing sophistication among OSD users, several components plan to acquire powerful internal processing capability during this Program Objective Memorandum (POM) period, and DCOAR is exploring mass storage and retrieval technology.

The Foreign Disclosure and Technical Information System (FORDTIS) is implemented on hardware that is owned by OUSD(P), situated in the 7CG computer room, and maintained by 7CG. FORDTIS is accessed by dedicated secure communications lines to individual subscribers.

- *Defense Applied Information Technology Center (DAITC).* The DAITC is a new facility established by DCOAR to research, acquire, and test new technology pertinent to OSD needs and to develop systems to meet those needs. DAITC is establishing several laboratories:
 - ▶ An interoperability laboratory to test gateways and other means of network interconnectivity
 - ▶ An artificial intelligence laboratory to test decision support systems
 - ▶ An optical data entry and storage laboratory, which is testing PC-based media

- ▶ A supercomputing laboratory to test mass storage and retrieval devices.
- *Decision Support Capabilities.* OSD components are beginning to analyze their needs for decision support. In addition to the DAITC study of expert systems, these are current activities:
 - ▶ Several OSD components are building or planning executive decision support centers to support component missions. OUSD(P)'s Crisis Coordination Center, DDR&E's Decision Support Center, and OASD(RA)'s Executive Decision Support Center are designed to give senior managers direct access to critical data.
 - ▶ The OASD(C) and some offices within OUSD(A) are operating decision support systems involving program budget decision making. Other components are considering decision support needs along with other OA requirements.
- *Information Management Centers (IMCs).* Component IMCs collect and distribute messages and mail, manage and track suspenses, and control and archive documents within individual components. The level of automated support for these tasks varies within individual components. Plans have been made to provide all IMCs on the OSD secure LAN with automated support and to link these IMCs to their major sources of correspondence and messages, the WHS Correspondence and Distribution Center, and the JCS Information Services Center.

Additional information about the OSD technology baseline is included in Appendix D. Figure 3-1 is a notional representation of the OSD Computer Systems Architecture in FY88. It shows some of the major elements of the architecture and illustrates the proliferation of small departmental systems and standalone workstations.

3.1.2 Information Processing Trends.

The major processing trends are: (1) increased capability and standardization of workstations within components, (2) linking of staff workstations into LANs, (3) a move by components to "departmental computing" and away from reliance on outside data processing support, (4) an increase in the use of large databases and sophisticated modeling applications that require large scale computing power, and (5) increasing demands for executive decision support centers that are dedicated to component managers.

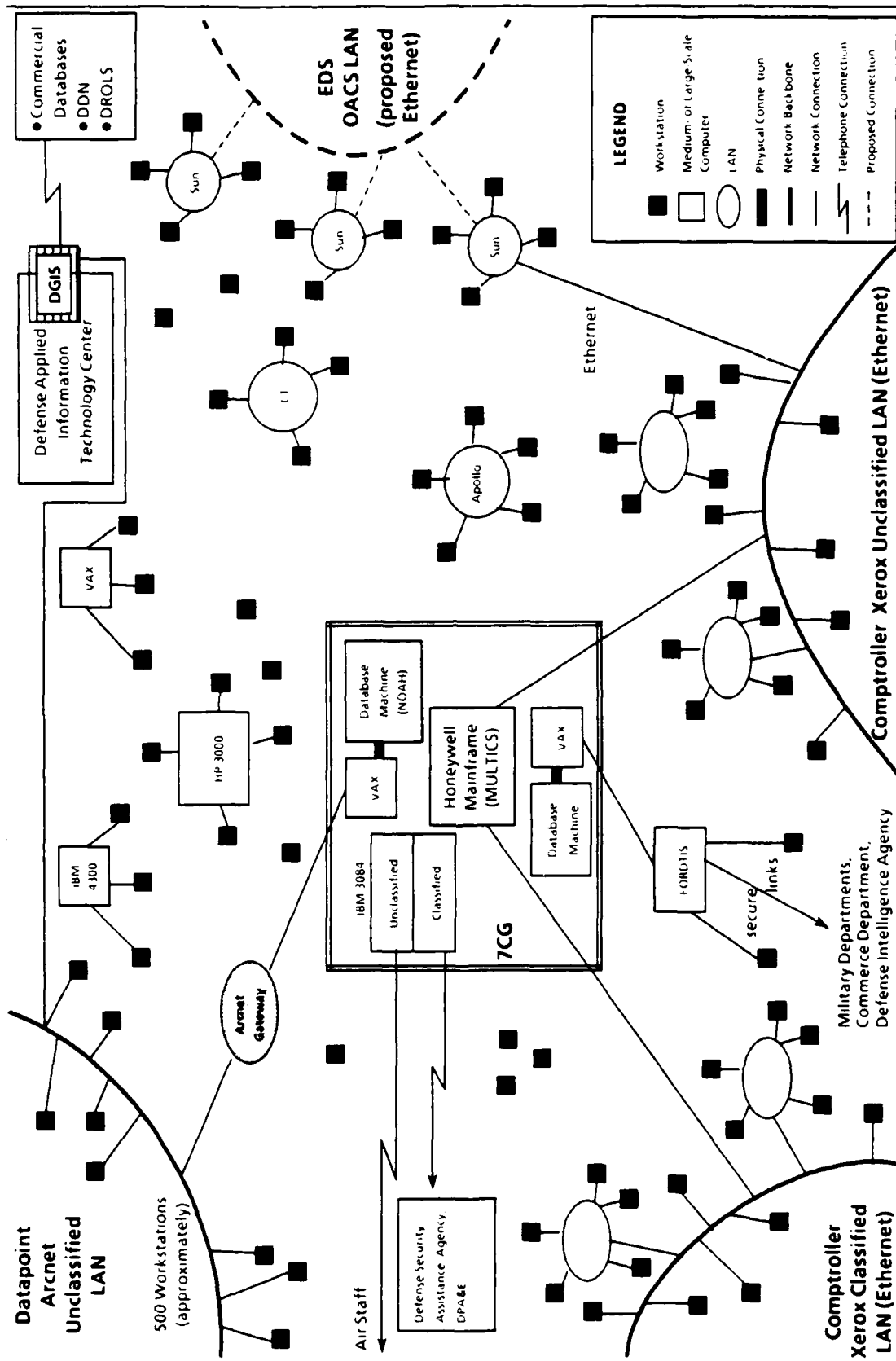


FIG. 3-1. OSD COMPUTER SYSTEMS ARCHITECTURE IN FY88

3.1.3 Acquisition of Information Technology.

3.1.3.1 Definition of Requirements.

OSD has no agreed standards for preparing and evaluating information requirements. A number of office-level analyses of requirements have been commissioned by DCOAR and some MCOARs over the past 5 or 6 years. Many of these analyses have resulted in design, acquisition, and implementation of OA systems that have substantially improved OSD staff productivity. Some have not produced usable requirements because of inadequate preparation or scope, weak methodology, insufficient interest by office management, or failure to consider other systems with which the systems being designed had to be compatible.

Some of the inadequate studies accounted in part for the subsequent proliferation of uncoordinated OA systems that marked the 1982 – 86 period. User requirements for most AISs were stated in terms of equipment specifications and were procured through limited-, sole-source, or 8-A contracts. Interoperability requirements and standards were rarely considered pertinent to a specific procurement. DCOAR has taken steps recently to make OSD components aware of standards in the FIRMR, particularly with large procurements.

Several more recent, more effective analyses have covered a number of offices and components. One of the more comprehensive analyses, involving the OASD(C) and the OUSD(A), was aimed at building upon the OA capabilities provided by first- and second-generation Xerox systems. Another major effort, for the Office of the Assistant Secretary of Defense (Production and Logistics) [OASD(P&L)] and Office of the Assistant Secretary of Defense (Force Management and Personnel) [OASD(FM&P)], is intended to move these components from an environment of dedicated word processors to the frontiers of OA.

3.1.3.2 Support of OSD by Defense Supply Service-Washington.

The Defense Supply Service-Washington (DSS-W) is the principal contracting facility supporting OSD. Most OSD requisitions for equipment, supplies, and services are processed through DSS-W, which also supports Military Service Headquarters, the Joint Staff, and other activities in the Pentagon. A major source of discontent in OSD is the length of time required to process an acquisition request. A recent PACE Enterprises study cites the process of computer acquisition as one of

the three issues MCOARs consider top-priority concerns for information resources planning. Most MCOARs have found the process subject to "...untimely delays, poor or nonexistent tracking mechanisms, and a failure, by DCOAR, to keep MCOARs informed about the progress of an acquisition." DCOAR is working with DSS-W to alleviate the problem. Some of the steps they have recently taken are:

- Design and funding by DCOAR of a new ADP acquisition process to help DSS-W improve processing and management of contracts for OSD and other organizations. The process includes both greater use of automation and closer contact between DCOAR and DSS-W during the acquisition process.
- Reorganization of DCOAR to make it responsive in support of OSD components.
- Establishment of a twice-weekly DCOAR 419 Review Board to consider AIS procurement requests from components.

3.1.4 Management of Corporate Data.

Several WHS organizations have charters to share responsibility with MCOARs for managing OSD data. DCOAR is to provide information technology to store and retrieve data, DC&D is to manage data contained in Federal records, DIOR is to set data standards and manage some automated corporate databases, and DREF establishes data security policy. When data-related functions were assigned to the three directorates, most records were supported by manual storage and retrieval systems, and close coordination among the directorates was unnecessary. Plans now call for automated support to most OSD corporate data within the present POM cycle. Since 1980s technology provides many options for transfer and storage of corporate data, data standards and records disposition issues must be addressed in every information technology project.

3.1.4.1 Corporate Databases.

Many projects in the POM provide resources that support the management of corporate data critical to OSD decision-making. OSD sponsors over 90 databases and manipulates data from many others in the decision-making process (see Appendix D). Frequently, OSD decisions require analysis of large databases with sophisticated models. In some instances, databases are needed by the sponsoring offices only. Other databases contain information useful to both the sponsoring component and other components. Examples of data to which multiple users need

access are the FYDP and its annexes, All-Volunteer Force data, Security Assistance data, and International Treaty data. At present, the sponsoring component maintains its databases and controls access to them.

The development of the Intelligence Assessment Information System (IAIS) is an example of a provision to support data access needs of multiple users. The Office of Net Assessment (ONA), in support of a joint intelligence data-sharing effort among OSD, the Defense Intelligence Agency (DIA), the Central Intelligence Agency (CIA), and the Military Departments has begun to develop an automated IAIS. The IAIS will integrate a variety of databases from the intelligence community and supporting contractors to promote standardized data elements within the intelligence community. It supports integration of CIA, National Security Agency (NSA), and Rand Corporation modeling capabilities in a common UNIX environment. The IAIS is providing the Secretary of Defense with a broader range of intelligence data and assessment techniques that will make analysis of strategic options more responsive to his needs.

A combination of automation initiatives within the OASD(C3I) is improving management of DoD intelligence resources worldwide. The Intelligence Resource Information System (IRIS) began development in FY86 and will have full operational capability in early FY88. Secure clustering of office workstations is proceeding through FY88 and will be followed in FY89 - 90 by linkage of office clusters into an integrated LAN.

An example of an attempt to augment an existing database to support multiple users is the proposal to satisfy requirements of the Defense Technology Security Administration (DTSA) by use of FORDTIS. FORDTIS provides the means for managing the coordination of export cases between Departments and DoD offices; DTSA automation capabilities focus on DoD policy analysis and formulation. DTSA was established in 1985 to improve controls of critical technology within DoD and between Federal departments and U.S. allies. These controls concern international transfers of defense-related technology, policies governing transfers, and intelligence and enforcement activities to restrain the flow of such transfers to potential adversaries. Integration of the needs of this organization with the existing capabilities of FORDTIS is being considered.

3.1.4.2 Providing Access to Corporate Data.

Sharing data within the context of an AIS may merely mean that document or database files can be transferred electronically across a LAN or from one system to another through a physical exchange of magnetic media. Several trends are influencing the ways in which the OSD staff will access DoD-wide databases and networks:

- New OA requirements generated by OSD components consider systems with which the proposed system must share data. System interface requirements that allow components to access data of importance to them are considered at the beginning of OA projects.
- New developments in database machines and database management systems (DBMSs) have improved access by different OSD systems to common databases and software applications. A Britton-Lee database machine supports FORDTIS, two have been added to the Arcnet, and one is at the DAITC.
- The Defense Communications Agency (DCA) is coordinating an effort to develop interoperability standards under the Open Systems Interconnection (OSI) seven-layer communication model.

3.1.5 Information Security.

The majority of OSD managers and MCOARs who responded to a recent survey of information resource management conducted by PACE Enterprises for DCOAR specified security as a high-priority concern. Comments about security represented several perspectives on the nature of the problem. Most frequently mentioned were two difficulties stemming from having to satisfy security restrictions: higher costs and fewer technical alternatives in equipment decisions. IRM planners consider information security in the earliest stages of information system planning. All OSD systems that process classified information comply with NSA standards for the protection of classified information. The cost of compliance with these standards is high, and the number of vendors whose products meet the standards is low. A subject of considerable discussion in OSD is whether adequate protection for classified information can be achieved within ADP systems without the controls that are now required.

Information acquired or generated within one OSD component is often needed by another. As electronic movement of information within and between OSD

components increases, OSD faces new challenges in trying to balance the need for control and sharing of data. DCOAR and the MCOARs are investigating hardware, software, and procedures that will ensure adequate protection while easing the sharing of data.

3.2 RESOURCE ALLOCATION TO SUPPORT IRM GOALS.

According to DCOAR, OSD spent over \$60 million on information technology in FY87 and plans to spend more than \$100 million in FY89. Expenditure for information technology is projected to be the largest category of the OSD budget. By FY88, information technology costs will exceed even OSD personnel costs, which traditionally have constituted the largest cost category. Table 3-1 compares information technology and personnel costs for FY88 and FY89.

TABLE 3-1
INFORMATION TECHNOLOGY SHARE OF OSD COSTS
(Thousands)

Category	Fiscal year	
	1988	1989
OSD	\$143,885	\$155,839
WHS	178,277	183,758
Total	322,162	339,597
Personnel	94,953	96,012
Information technology	95,468	102,462
All other	131,741	141,123
Personnel as percent of total	24.5	28.3
Information technology as percent of total	24.6	30.2
All other as a percent of total	50.9	41.5

Note: The total of OSD and WHS operations and maintenance (O&M) and procurement budget categories

The following sections show how the FY87 information projects align to the goals and objectives developed by the IRM Steering Committee. Funding profiles identify all funds earmarked for obligation in the current fiscal year, with projected funding through FY92. All projects are described in Appendix E. Appendix E also includes a description of the IRM programs used to group information projects for the PPBS.

Table 3-2 shows in summary how the IRM budgets for FY88 – 92 are allocated in support of the various IRM goals and objectives. (See Section 2.2 for descriptions.)

The FY88 and FY89 budget data appear in more detail in Tables 3-3 and 3-4. Tables 3-5 and 3-6 list the same information in terms of percentages. The OSD components in Table 3-3 are the actual offices in OSD supported by WHS, that have separately identifiable information technology budgets. These tables are not intended to accurately reflect the OSD organizational hierarchy. For examples, FORDTIS and ONA are organizationally subordinate to the OUSD(P); the new OUSD(A) did not exist when the budgets were formatted, so the OUSD(A) components are shown as independently budgeted; and the Office of the Assistant Secretary of Defense (Legislative Affairs) [OASD(LA)] is not shown because all OASD(LA) resources are included in the DCOAR budget.

TABLE 3-2

FIVE-YEAR INFORMATION TECHNOLOGY BUDGET ALLOCATIONS BY GOALS AND OBJECTIVES

(Thousands)

Goals and objectives	FY88	FY89	FY90a	FY91a	FY92a
Goal 1 – Systems	\$65,167	\$ 69,689	\$12,587	\$13,257	\$13,953
Objective 1.1 – OA	35,248	38,184	8,229	8,670	9,129
Objective 1.2 – DSS	21,648	23,702	3,893	4,090	4,309
Objective 1.3 – Computing	8,197	7,590	435	459	483
Objective 1.4 – Distribute messages	75	213	29	31	32
Goal 2 – Data Sharing	20,138	18,982	4,452	4,681	4,919
Objective 2.1 – Identify common data	15,001	14,004	2,563	2,690	2,822
Objective 2.2 – Communication standards	94	150	0	0	0
Objective 2.3 – Network strategy	5,042	4,828	1,889	1,991	2,097
Objective 2.4 – Corporate data	0	0	0	0	0
Objective 2.5 – Management plan	0	0	0	0	0
Objective 2.6 – Directory	0	0	0	0	0
Goal 3 – Security	3,916	5,701	927	977	1,029
Objective 3.1 – Security standards	2,669	4,190	777	818	862
Objective 3.2 – Burden of proof	0	0	0	0	0
Objective 3.3 – Software standards	0	0	0	0	0
Objective 3.4 – Multiple levels	1,248	1,511	151	159	167
Goal 4 – New Technology	5,356	7,422	1,386	1,461	1,538
Objective 4.1 – Analysis	3,674	3,684	951	1,002	1,005
Objective 4.2 – Prototypes	1,682	3,738	435	459	483
Goal 5 – Management	892	668	0	0	0
Objective 5.1 – IRM planning	892	668	0	0	0
Objective 5.2 – AIS6	0	0	0	0	0
Objective 5.3 – Quality control	0	0	0	0	0
Totals for all years	\$95,468	\$102,462	\$19,352	\$20,376	\$21,440

* Procurement funds only

TABLE 3-3

**ALLOCATIONS SUPPORTING GOALS IN COMPONENT INFORMATION
TECHNOLOGY BUDGETS FOR FY88 (THOUSANDS)**

OSD component	Goal 1 ^a	Goal 2 ^b	Goal 3 ^c	Goal 4 ^d	Goal 5 ^e	Component's total IRM budget
ASD (Production and Logistics)	\$ 2,157	\$ 2,348			\$115	\$ 4,620
ASD (Command, Control, Communications, and Intelligence)	1,051	835				1,886
ASD (Comptroller)		6,455				6,455
Executive Secretary	1					1
ASD (Force Management and Personnel)	1,589	632				2,221
Foreign Disclosure Technical Information System		2,130				2,130
Federal Voting Assistance Program		10				10
General Counsel		648				648
ASD (Health Affairs)	470	652				1,122
AtSD (Intelligence Oversight)	22					22
Director, Net Assessment	191	395				586
ASD (Public Affairs)	1,424					1,424
Director, Program Analysis and Evaluation	6,119	831				6,950
IJSD (Policy)	17,390	257				17,647
ASD (Reserve Affairs)	753	28	7	135		923
Director, Defense Research and Engineering	9,785	3,411				13,196
Director, Operational Test and Evaluation	344					344
WHS						
Budget and Finance	694					694
Director for Computer and Office Automation Resources	19,011		3,909	5,220	777	28,917
Correspondence and Directives	74	75				149
Director for Information Operations and Reports		1,430				1,430
Personnel and Security	109					109
Space Management	3,983					3,983
Total	\$65,167	\$20,137	\$3,916	\$5,356	\$891	\$95,468

^a Goal 1 - Systems^b Goal 2 - Data Sharing^c Goal 3 - Security^d Goal 4 - New Technology^e Goal 5 - Management

TABLE 3-4

**ALLOCATIONS SUPPORTING GOALS IN COMPONENT INFORMATION
TECHNOLOGY BUDGETS FOR FY89 (THOUSANDS)**

OSD component	Goal 1 ^a	Goal 2 ^b	Goal 3 ^c	Goal 4 ^d	Goal 5 ^e	Component's total IRM budget
ASD (Production and Logistics)	\$1,900	\$2,489			\$116	\$ 4,505
ASD (Command, Control, Communications, and Intelligence)	881	664				1,545
ASD (Comptroller)		5,076				5,076
Executive Secretary	1					1
ASD (Force Management and Personnel)	1,774	712				2,486
Foreign Disclosure Technical Information System		2,480				2,480
Federal Voting Assistance Program		39				39
General Counsel		900				900
ASD (Health Affairs)	330	623				953
AtSD (Intelligence Oversight)	26					26
Director, Net Assessment	265	316				581
ASD (Public Affairs)	964					964
Director, Program Analysis and Evaluation	6,219	903				7,122
USD (Policy)	18,519	286				18,805
ASD (Reserve Affairs)	692	34	38	118		882
Director, Defense Research and Engineering	9,022	2,898				11,920
Director, Operational Test and Evaluation	796					796
WHS	671					671
Budget and Finance						671
Director for Computer and Office Automation Resources	26,828		5,663	7,304	552	40,347
Correspondence and Directives	213	77				290
Director for Information Operations and Reports		1,485				1,485
Personnel and Security	99					99
Space Management	489					489
Total	\$69,689	\$18,982	\$5,701	\$7,422	\$668	\$102,462

^a Goal 1: Systems^b Goal 2: Data Sharing^c Goal 3: Security^d Goal 4: New Technology^e Goal 5: Management

TABLE 3-5

**ALLOCATIONS SUPPORTING GOALS IN COMPONENT INFORMATION
TECHNOLOGY BUDGETS FOR FY88 (PERCENTAGES)**

OSD component	Goal 1 ^a	Goal 2 ^b	Goal 3 ^c	Goal 4 ^d	Goal 5 ^e
ASD (Production and Logistics)	2	2			<1
ASD (Command, Control, Communications, and Intelligence)	1	1			
ASD (Comptroller)		7			
Executive Secretary	<1				
ASD (Force Management and Personnel)	2	1			
Foreign Disclosure Technical Information System		2			
Federal Voting Assistance Program		<1			
General Counsel		1			
ASD (Health Affairs)	<1	1			
AtSD (Intelligence Oversight)	<1				
Director, Net Assessment	<1	<1			
ASD (Public Affairs)	1				
Director, Program Analysis and Evaluation	6	1			
USD (Policy)	18	<1			
ASD (Reserve Affairs)	1	<1	<1	<1	
Director, Defense Research and Engineering	10	4			
Director, Operational Test and Evaluation	<1				
WHS					
Budget and Finance	1				
Director for Computer and Office Automation Resources	20		4	5	1
Correspondence and Directives	<1	<1			
Director for Information Operations and Reports		1			
Personnel and Security	<1				
Space Management	4				
Total	69	21	4	5	1

^a Goal 1 - Systems^b Goal 2 - Data Sharing^c Goal 3 - Security^d Goal 4 - New Technology^e Goal 5 - Management

TABLE 3-6

**ALLOCATIONS SUPPORTING GOALS IN COMPONENT INFORMATION
TECHNOLOGY BUDGETS FOR FY89 (PERCENTAGES)**

OSD component	Goal 1 ^a	Goal 2 ^b	Goal 3 ^c	Goal 4 ^d	Goal 5 ^e
ASD (Production and Logistics)	2	2			<1
ASD (Command, Control, Communications, and Intelligence)	1	1			
ASD (Comptroller)		5			
Executive Secretary	<1				
ASD (Force Management and Personnel)	2	1			
Foreign Disclosure Technical Information System		2			
Federal Voting Assistance Program		<1			
General Counsel		1			
ASD (Health Affairs)	<1	1			
AtSD (Intelligence Oversight)	<1				
Director, Net Assessment	<1	<1			
ASD (Public Affairs)	1				
Director, Program Analysis and Evaluation	6			1	
USD (Policy)	18	<1			
ASD (Reserve Affairs)	1	<1	<1	<1	
Director, Defense Research and Engineering	9	3			
Director, Operational Test and Evaluation	1				
WHS					
Budget and Finance	1				
Director for Computer and Office Automation Resources	26		6	7	1
Correspondence and Directives	<1	<1			
Director for Information Operations and Reports		1			
Personnel and Security	<1				
Space Management	<1				
Total	68	17	6	8	1

^a Goal 1: Systems^b Goal 2: Data Sharing^c Goal 3: Security^d Goal 4: New Technology^e Goal 5: Management

SECTION 4

EVALUATION

4.1 INTRODUCTION.

This is a look at the progress being made by OSD's management of information resources toward the new IRM goals and objectives described in Section 2. This evaluation does not include formal benefit-cost analyses of each objective. To set a perspective for the sections that follow, Section 4.2 describes accomplishments and major trends of the past few years. The remaining sections report evaluations of management performance toward those goals and objectives.

4.2 RECENT ACCOMPLISHMENTS.

Despite the lack of a comprehensive IRM plan for OSD, imaginative information managers have achieved significant progress in some areas. These are major accomplishments that have occurred in the past few years:

- Improvements in IRM program management
 - ▶ Creation of a new IRM planning process, aimed at controlling the current *ad hoc*, decentralized collection of AISs
 - ▶ Formation of an IRM Steering Committee, to develop overall IRM goals and objectives for OSD and to identify major information activities that are needed to implement these goals and objectives
 - ▶ Design of a new ADP acquisition process to help DSS-W improve processing and management of OSD (and other) contracts
 - ▶ Reorganization of DCOAR in WHS to be more responsive to the needs of OSD components
- Better use of technology
 - ▶ Replacement of dedicated word processing systems by modern OA systems that are beginning to integrate word processing with idea processing and with research, analysis, and drafting done by professional staff and managers

- ▶ Increasingly disciplined joint efforts of component managers to establish interoperability standards among a variety of hardware and software acquisitions
- ▶ Agreement among managers that every OSD staff member should be provided access to an OA workstation, equipped with information technologies that will enhance that staff member's productivity
- ▶ Development of LANs and workstation clusters that improve communications and information processing between staff members and managers
- ▶ Investigation and prototype application of new technologies under the DAITC
- ▶ Improvement in support for classified processing in the work area and in secure communications.

Three of the foregoing accomplishments are of particular interest because they involve DCOAR and the OSD components in joint planning for information resource management for all of OSD. The creation of an OSD-wide IRM planning process and the formation of an IRM Steering Committee create an opportunity for formal consideration of component views in the early planning and programming phases of the PPBS cycle. The IRM goals and objectives presented in this report are the first fruit of this joint planning effort. Development of the DAITC extends this cooperation from planning to investigation of technological innovations aimed at specific OSD needs.

Technological innovations already being implemented include a lap-top computer communications system to connect the Secretary of Defense with his office while he is traveling, use of new database management technology to improve Pentagon security and DoD spare parts management, and closer coordination of intelligence assessments between OSD and the intelligence community through joint development of software. Investigation of potential innovations now under way include the application of super-minicomputer and parallel processing technology to the redesign of automated support for the DoD Program Budget, gateway communications to provide access to databases and networks outside the Pentagon and with the Commanders-in-Chief of the Unified and Specified Commands (CINCs), and hypertext programs to allow context-sensitive search and retrieval of heterogeneous information through individual workstations.

4.3 CURRENT TRENDS.

Current management of information resources is marked by three major trends:

The first is a growing sense among all OSD managers of the need to allow at least transfer of files – and, preferably, use of common applications, as well – among the heterogeneous systems that have proliferated over the past 6 or 7 years. One outcome of this trend is the emergence of four major OA "systems" vying for dominance and for more of the information technology budget: Xerox, Sun, Wang, and generic IBM-compatible PCs. Despite the competition among proponents of these systems, there is common acknowledgment that these systems are not mutually exclusive and that they should be made as interoperable as technology and funds permit.

The second trend is recognition that planning, programming, and allocation of resources for information processing within OSD can no longer be decentralized but must instead be centrally coordinated in a systematic process. The recent establishment of the IRM Steering Committee, discussed above, is a symptom of this trend.

The third trend is introduction of the imaginative use of information technology and initiatives in management improvements by information technology professionals, not OSD line managers. The DAITC, for example, was conceived and established by DCOAR without any impetus from OSD staff. The results can appear to be technical solutions looking for problems to solve, or can be premature applications of resources to support organizations that are not ready for the technological move. Fortunately, most of these technological initiatives serve as catalysts for engaging end-user staff and managers in the process of applying new technology to meaningful applications.

4.4 IRM GOALS, OBJECTIVES, AND PERFORMANCE.

4.4.1 Goal 1: Provide the AIS Resources Needed for Maximum Productivity by the OSD Staff.

Objective 1.1: Satisfy general requirements of the OSD staff for office automation information processing capability. Set up enough workstations in or near members' staff work areas to meet the needs of users.

Recent analyses of OSD requirements have clearly agreed on the individual workstation concept, the seamless integration of a document's life cycle that marks OA, and the specific processing capabilities needed at those workstations within particular offices. What are lacking are the standards and guidelines to ensure establishment of OA capabilities with adequate attention to interoperability between OA systems within OSD and the ability to communicate with systems outside OSD. This shortfall is addressed under Goal 2.

Of the FY88 funds programmed for information technology, 37 percent is dedicated to meeting this objective, far more than is allocated to any other and nearly twice the funding allocated to all the objectives under Goals 2 through 5. Clearly, the share of resources allocated underlines the number one priority of this objective.

Despite this massive allocation of resources, the major shortfall in fulfilling Objective 1.1 is the shortage of workstations, particularly workstations capable of processing classified material. Although functionality of workstations will continue to be the basis of continuing competition among vendors and of continuing desire by users to acquire the next upgrade, the majority of OA users in OSD who have workstations are generally equipped with more functionality than they are now capable of using. In some instances, functionality is degraded by limitations of TEMPEST equipment, whose performance can be markedly worse than similar non-TEMPEST equipment. This problem is addressed under Goal 3. Another limitation to the ability of users to fully employ the OA capabilities at hand is lack of training. This limitation is addressed under Goal 4. Nevertheless, the principal problem is the shortage of workstations, not their quality.

There are about 2,000 OA workstations in place in OSD, with a need for another 1,000 to bring all OSD offices to at least the functional level of mid-1980s OA technology. Graphics software is in use but (except for Xerox workstations) is not well integrated with other OA capabilities. Since word processing is the centerpiece of OSD OA, followed by presentation graphics, vendors (such as Xerox and Sun) that integrate off-the-shelf software-hardware combinations with laser printing are now well ahead of the mid-1980s standard.

Objective 1.2: Satisfy DSS requirements within and across OSD components. Provide OSD with adequate levels of decision support capabilities. Where feasible, integrate DSS and OA system requirements.

DSS requirements in OSD are less clearly defined than OA requirements. Although technology will make DSS capabilities increasingly available to future OA systems, the distinction between OA and DSS is still a useful one for purposes of planning for OSD information processing needs over the next 5 years.

It appears that senior executives have not yet been involved in serious analyses of their own information-processing needs. Nor have DSS capabilities been fully assessed for their application to individual staff needs. Most of the requirements analyses that have been done for OSD components address DSS requirements in terms of Decision Support Centers for executive support or crisis management from a centralized location. However, they do not provide for integration of decision support tools within the OA workstation environment. One reason for the lack of adequate requirements analyses is that DSS technologies and, therefore, DSS requirements are moving targets. Although there is agreement among information managers about the need for DSS capabilities in the rapidly expanding OA environment, there must first be a clear definition of those capabilities.

The likelihood of substantial changes in OSD management structure, resulting from management reviews required by the Goldwater-Nichols DoD Reorganization Act of 1986, indicate that there may be substantial differences between what mid-level managers may think their executives need in the way of decision support systems, and what new executives in re-structured management positions may actually need. One example is the recommendation to create a third Undersecretary of Defense for Personnel Resources [USD(PR)] who will supervise the ASDs (Force and Manpower Planning), (Reserve Affairs), and (Health Affairs). Another example is the recommendation to configure the ASDs (International Security Affairs), (International Security Policy), and (Special Operations) into three assistant secretaries with responsibilities aligned with nuclear, alliance, and regional affairs.

This objective is allocated 23 percent of all information technology funding for FY88, second only to the funding for Objective 1.1.

Objective 1.3: Satisfy requirements for large- and medium-scale computational resources within and across OSD components. Provide appropriate levels of access within OSD. Where feasible, integrate these requirements with OA and DSS resources.

Large- and medium-scale computational resources are those super-minicomputers, mainframes, supercomputers, and database machines that are needed to support many users, extensive transactions, large databases, and the intensive computational requirements of modeling.

This objective is programmed to receive the third largest proportion of funding out of the FY88 information technology budget, for a total of 9 percent. Almost half of these funds are for upgrade of the Program Budget System, and over a third are for DPA&E computational support. The dominant AIS that supports this objective is the Honeywell MULTICS, which is operated and maintained by the 7CG. The MULTICS serves some of the processing needs of the Air Staff in addition to those of OSD. The scheduled replacement of the MULTICS, called the Headquarters System Replacement Program (HSRP), in FY89 - 90 is the major issue to be addressed by this objective.

Responses to the MULTICS replacement request for proposals are now being evaluated by the 7CG; specific technological alternatives are being investigated independently by the Comptroller and by DCOAR at the DAITC. Improved technical opportunities to handle what were once large-scale processing requirements with the new mini- and super-microcomputers support the trend toward "departmental computing," where information technology resources are managed by the using departments. The HSRP, for instance, involves both technical and organizational issues. Earlier 7CG resistance to the "departmental computing" notion may be reconsidered following the recent change in 7CG management. Despite the technical feasibility of placing the processing power in the hands of the user, however, the personnel resources needed for operating and maintaining these systems indicate that the 7CG should continue to provide this support. OSD users, however, should become responsible for planning and programming the funds needed to support them.

The 7CG is now at 80-percent strength. Because 7CG support to OSD is organized by component projects, without overall OSD supervision, there is no

effective means of optimizing the distribution of this already inadequate level of support. OSD senior managers need more support from the 7CG.

OSD offices have few large databases to store or manage. With the exception of the databases that are related to Foreign Military Sales (FMS) and maintained by the Defense Security Assistance Agency (DSAA), the FORDTIS database maintained by the OUSD(P), and the Program Budget and Defense Acquisition Management System databases maintained by OASD(C), OSD databases are small enough to be managed "in-house" with current OA systems technology and additional staff or to be maintained by outside agencies or contractors.

Objective 1.4: Automate distribution of JCS messages between the JCS Information Services Center and OSD directorates.

Requirements analyses have shown that the most important OA capability in many OSD offices, after word processing, is automated distribution of incoming JCS message traffic to individual workstations. An analysis of OUSD(P) requirements in 1983 showed that as much as one-third of many action officers' time was spent in reviewing JCS messages. The report estimated that automating this distribution process could save more than \$1 million a year in the Office of the Assistant Secretary of Defense for International Security Affairs [OASD(ISA)] alone.

Despite the acknowledgment by many OSD staff members of the high priority of this objective, it is programmed to receive less than 1 percent of the FY88 information technology budget. That funding level is devoted mainly to communications between DPA&E and the overseas CINCs on program budget matters. This objective warrants more funding to align resource allocation with priorities.

4.4.2 Goal 2: Improve Access to Corporate Data through Intercomponent Networking via Gateways and Other Channels that Share Resources among OSD Component Users.

Objective 2.1: Identify information processes and supporting data sets that are common to more than one OSD user or to OSD and the Joint Staff.

Table 4-1 shows an initial representation of major information processes and supporting data sets that are fundamental to OSD operations. These processes and data sets should be of "corporate" interest. Although this initial representation is based on a review of analyses of requirements done for selected components and is,

TABLE 4-1

OSD PROCESS TO DATA CLASS MATRIX

Processes	Data Classes																									
	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Preparation of DG	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Preparation of FYDP	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Budget execution and review	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Preparation for congressional hearings	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Prepare SECDEF Report to Congress	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Readiness and mobilization planning	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Technology transfer	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Defense Systems Acquisition Review	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Initial arms collaboration	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Interagency meetings	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

C = Data created or updated by the process

A = Data only accessed by the process

AAR	Automated Acquisition Regulations	DG	Defense Guidance	ILRSA	Joint Long Range Strategic Assessment
AVFDB	All Volunteer Force Database	DIOR-DBs	Databases maintained by DIOR	JPAM	Joint Program Assessment Memorandum
BRS	Budget Review System	DPAS	Defense Personnel Analysis System	JSPD	Joint Strategic Planning Document
CATS	Congressional Action Tracking System	FINANDIS	Financial Data Information System	JSPDSA	JSPD Supporting Analysis
CCDR	Contractor Cost Data Reports	FMS	Foreign Military Sales	ML & MCTL	Munitions List and Military Critical Technology List
DAMDB	Defense Acquisition Management Database	FORDTIS	Foreign Disclosure and Technical Information System	OMB&CG	OMB and Congressional Guidance
DEARAS	Defense Emergency Authorities Retrieval and Analysis System	FYDP	Five-Year Defense Program	PDMs	Program Decision Memoranda
DEIMS	Defense Economic Impact Modeling System	ILD8	International Logistics Database	POMs	Program Objective Memoranda
DEIS	Defense Energy/Information System	ILS	Integrated Logistics Support	TESTIMONY	Testimony before Congress
		ITDB	International Treaties Database	TOA	Total Obligational Authority
		JIEP	Joint Intelligence Estimate for Planning	WARMAPS	Wartime Manpower Planning System

therefore, not comprehensive, it matches some of the major OSD information processes to data sets. This is a first step toward identifying OSD "corporate data."

An effort aimed at identifying OSD interoperability requirements is being performed by Comsys and is focused on communications needs between OSD components, without identifying those needs in terms of their information content. This Comsys effort could be augmented to provide communication needs in terms of information processes and data involved, together with indicators of the essentiality of each exchange to mission accomplishment.

Sixteen percent of total information technology funding for FY88 is allocated to this objective, compared with less than 1 percent for Objective 2.2, which addresses external data access. Some realignment of funding could give greater relative emphasis to inter-OSD data access.

Objective 2.2: Develop communications standards and gateway guidelines for providing OSD with access to non-OSD databases and networks.

Several trends influence the ways in which the OSD staff will access outside databases and networks. For the long term, the Assistant Secretary of Defense for C3I has instituted a policy of cautious exploration, intended to move eventually to OSI standards, and has directed the DCA to coordinate this effort for all of DoD. The effort to develop standards for interoperability under the OSI seven-layer model may eventually provide an environment that will preclude specialized software and hardware, but probably not in the near future.

Because the initial interoperability standards focus on the lower levels of the OSI model and will be slow in coming, DoD agencies are now proceeding with their own gateway systems which offer access in the near term to databases and networks of particular interest. This trend is of concern because it may proliferate organization-specific gateway architectures that could create obstacles for eventual conversion to more standardized methods of access.

The final trend is an increasingly sophisticated effort by the commercial sector to provide access to a multitude of databases and to manage an increasing number of Government databases for Federal clients. Insofar as this trend is not subject to standardization or coordination, user agencies will have even greater incentive to proliferate unique gateways, also exacerbating eventual conversion problems.

The CALS system is an example of a major data interchange program which needs communications and gateway guidelines. Its challenges are similar to those posed for DoD. CALS needs common conventions for exchanging both graphic and text data, and will support multiple users using different equipment in disbursed geographic locations. The draft telecommunications plan for CALS recommends adoption of OSI standards for the logistics community and the use of intelligent gateways to ease communication between users. Appendix G further describes CALS.

Objective 2.3: Develop an OSD network strategy and schedule for interconnectivity among:

- Workstations within offices
- Workstation clusters or LANs within each component
- Component LANs across OSD
- OSD networks with the Joint Staff, the Military Departments, and Defense agencies.

An OSD network strategy should be based on a clear identification of interoperability requirements. The current Comsys development of a draft Interoperability Master Plan is a useful vehicle for identifying these requirements, examining alternative network strategies, and proposing a schedule of implementation.

Current LAN standards are being established within OSD by *de facto* adoption of Ethernet by the Comptroller and an increasing number of OUSD(P) and OUSD(A) offices. Ethernet appears to have been adopted, not because it has been identified as the best future solution for networking OSD OA applications, but because there is already an established base of Xerox and DEC Ethernet capabilities that can be quickly augmented to provide low-level "gateway" communications in the near term.

The 7CG HSRP, which is intended to replace the Honeywell MULTICS, provides for a broadband, backbone cable that has the capacity to serve as the hub for OSD component LANs.

At 5 percent of the FY88 budget, this objective appears to be appropriately funded. Additionally, funding for interconnectivity is embedded in a number of projects associated with other objectives.

Objective 2.4: Establish criteria for deciding how to manage the corporate data identified from Objective 2.1.

The aggregated mappings of major data sets, processes, and organizations, presented in Table 4-1 under evaluation of progress toward Objective 2.1, are not defined in enough detail for accomplishing this objective or the remaining ones under Goal 2 that are aimed at implementing an OSD Corporate Data Management Plan.

"Data needed by more than one component" is a useful working definition of corporate data. Identification of those data should be included in the current effort to identify interoperability requirements.

Objective 2.4 is not funded under any of the component projects for the FY88 information technology budget.

Objective 2.5: Establish an OSD Corporate Data Management Plan that describes how corporate data will be collected, maintained, and distributed.

This objective is unfunded as an OSD information project, although it is being managed implicitly under the OASD(C) as part of its functions to manage DoD systems, and manage and control DoD information requirements (see DoDD 5118.3).

The information-management aspect of IRM is now handled within WHS by DCOAR, DIOR, DREF, and DC&D whose responsibilities were assigned before the concept of managing information as a resource was introduced in DoD. Achieving this objective requires close coordination among those performing information management roles and the Office of the Comptroller. It should be carried out in support of current efforts to establish database management policy by the Office of the Deputy Assistant Secretary of Defense for Information Resource Management, OASD(C).

Objective 2.6: Develop an information resources directory for all information technology systems and databases used by OSD components and the JCS, to be made available to all OSD components.

This objective is unfunded as an OSD information project. There is need for development of an information resources directory that includes a description of all AISs and databases used by OSD components and the JCS, with methods for accessing the resource.

Also needed is a centralized inventory of OSD AISs and related resources, identifying for each system:

- Its common name
- Databases in the system
- Users
- Who is responsible for its use
- General configuration of equipment
- Available interfaces
- Major sources from which databases have been developed
- Annual operating costs (so that the inventory may also serve as a basis for budget planning and control).

4.4.3 Goal 3: Make Sure that AISs Provide Necessary Levels of Security.

Objective 3.1: Establish information systems that comply with DoD standards for secure communications within OSD.

Some AIS security standards have been established in the new AI26 that was issued as a supplement to DoDD 5200.1-R, *Department of Defense Information Security Program Regulation*. However, these standards are insufficient to guide the development of secure information systems within OSD without substantial additional guidance from the Defense Computer Security Center (DCSC). Technology is changing at a rate that makes it difficult to establish stable security standards for automated systems.

Communications security can be provided by compartmentation of AISs, by cryptographic methods, and by software technology. Although the BLACKER encryption methodology is expected within the next few years, it is not compatible with OSI communication standards. Since DCA has mandated this period for full coexistence of DoD and OSI architectures, we expect that BLACKER will – before its debut – be retrofitted to support OSI. In the near term, OSD managers will have to balance the higher cost of compartmented systems with the later availability of multilevel security provided by cryptography or software.

The programmed funding that reflects OSD's requirements for secure communications is 3 percent of the FY88 information technology budget.

Objective 3.2: Establish an OSD TEMPEST standard that implements DoD "burden of proof" policy, that is, not requiring TEMPEST standards unless a specific need is demonstrated.

OSD security standards in AI26 do not accord with DoD policy that the burden of proof for TEMPEST requirements should be based on determination of a specific threat. In late 1985, the DoD Security Review Commission reported to the Secretary of Defense that, among other things:

While TEMPEST protection may be essential in some overseas areas, the environment within the United States is dramatically different. Consequently, the rigid TEMPEST policy was modified two years ago to prescribe shielding only when inspection verified that a threat existed (p. 93).

No FY88 information technology budget funds are programmed for accomplishing this objective.

Objective 3.3: Comply with trusted computer software standards when establishing OSD information systems.

DoD's standards for trusted computer system evaluation (TCSEC) as defined in DoDD 5200.28-STD, December 1985, have been further interpreted under NCSC-TG-005 (Trusted Network Interpretation), July 1987, for network systems. Since the majority of OSD workstations are already operating in a network or cluster environment, and virtually all workstations will be in such an environment by the early 1990s, network standards are particularly relevant.

The evolution of networks within OSD will likely preclude accreditation of the total system as a "Single Trusted System," as described in NCSC-TG-005. It is likely that OSD networks will have to be evaluated under an "interconnected, accredited AIS view," which recognizes that parts of the overall network system may be independently created, managed, and accredited. Since OSD OA systems are principally microcomputer systems, the inherent weaknesses of these systems in providing hardware and software controls will continue to place reliance upon appropriate physical, personnel, and procedural controls.

AI26 does not contain standards or provide directions for making sure that the trusted computer concept is being pursued. None of the FY88 OSD information budget is programmed for this objective.

Objective 3.4: Establish OSD information systems so as to comply with DoD standards for multilevels of secure processing.

The limited hardware/software sophistication of microcomputer-based OA systems generally precludes the ability of the system to provide multiple levels of security. Separate OSD OA LANs will, therefore, have to be provided for dedicated levels of security operation for the foreseeable future.

The 7CG is considering alternative solutions to the multilevel security issue for medium- and large-scale computing requirements within the context of the HSRP.

AI26 does not contain standards for multilevels of secure processing. For this objective, less than 1 percent of the FY88 OSD information budget is programmed.

4.4.4 Goal 4: Make Sure that Advanced Technology is Used When Appropriate to Achieve Mission Goals and Reduce Costs.

Objective 4.1: Identify new AIS technologies and analyze their applicability to DoD needs.

This objective is programmed to receive 4 percent of total information technology funding for FY88.

The methods for determining which technologies and applications are to be analyzed are not clearly established, nor are they subject to a systematic process of selection. Determination of requirements to investigate new technology should undergo the same process as do requirements for other information technology projects. These requirements are discussed further under Objective 5.3.

Current technology assessment projects appear to cover a wide range of technology areas and most are managed in a centralized facility. This facility, the new DAITC, has four laboratories, each dedicated to an area of information technology. Since information technology assessments and prototyping are being conducted by the DoD components and agencies, DAITC management should establish a means of sharing such information to preclude unnecessary duplication of effort.

Although there are training facilities and contractors at the DAITC, these resources are not well integrated to support information technology training requirements across OSD. Since training of users on new technologies should be increased, use of the DAITC as a focal point for coordinating OSD-wide training seems to be a likely solution.

Objective 4.2: Analyze and test prototype LAN interfaces and protocols to improve OA compatibility.

Statement of this objective, independent from Objective 4.1 and as reflected in Goal 2, indicates the recognized importance of interconnectivity and interoperability within OSD. This fact, coupled with the importance attached to establishment of multilevel security capabilities, shows that the funding in support of this objective – currently programmed at 2 percent of FY88 information technology resources – is inconsistent with its importance.

4.4.5 Goal 5: To Reduce Cost, Plan for and Manage the Acquisition and Operation of AISs.

Objective 5.1: Establish 5-year strategic AIS IRM plans for OSD and for every OSD component.

This objective is meeting its first milestone under the development of this IRM Planning Report. One percent of FY88 information technology resources is budgeted in support of this objective.

This objective has received new impetus under the requirements of DoDD 7740.2, *Automated Information System (AIS) Strategic Planning*. The directive requires that every DoD component implement AIS strategic planning to provide for: (1) a structured process to facilitate identification, validation, and documentation of information needs; (2) periodic assessment of the information systems environment; and (3) documentation of the planning process in an AIS strategic plan. AIS strategic planning must interface with the existing PPBS and address total information needs over the period covered by the FYDP.

Although DoDD 7740.2 discusses "total" information needs within the context of an AIS plan, it is clearly targeted at only that part of information resources management that OMB Circular No. A-130 calls "Information Systems and Information Technology Management." The other part of IRM, "Information Management," is guided by other directives that deal with records and reports

management (e.g., DoDD 7040.1, DoD Information Resources Management Program). This Planning Report, as pointed out earlier, is in fact an AIS Planning Report since it is limited to management of information system and technology resources. Nevertheless, the report should evolve into a full-fledged IRM Planning Report that does address total information needs.

There is a need for continuing development of OSD component plans. Preparation of subsequent versions of the OSD plan would be made easier by collation and review of component plans. This IRM Planning Report should serve as the structural template for preparation of component plans, to enable component managers to concentrate on preparing their own versions of Sections 3, 4, and 5.

Objective 5.2: State, within AI56, a centralized approach and a process for OSD AIS IRM planning, programming, and budgeting.

Appendix B describes the IRM structure and process and addresses the centralized approach and process needed as part of a new AI56.

Objective 5.3: Within AI56, state guidelines and component-level quality-control procedures for:

- Adequate requirements analysis and justification
- System life-cycle management with cost amortization
- Exploration of market alternatives
- Benefit-cost analysis that incorporates information technology costs with other costs to site, operate, and maintain an OA system.

OSD has no agreed guidelines or standards for preparing and evaluating information requirements. Neither is there a formal structure for validating requirements. This is the single most important technical issue that must be resolved during the planning and programming cycle. No information technology budget funds are programmed in FY88 for accomplishing this objective. DCOAR has taken steps recently to make some components aware of the standards in the FIRMR, particularly components attempting to undertake heavy procurement of information technology.

Appendix F contains recommended instructions and guidelines for enclosure in a revised AI56, that address the bulleted items above.

SECTION 5

THE 5-YEAR INFORMATION RESOURCE MANAGEMENT PLAN

5.1 PURPOSE AND SCOPE.

5.1.1 Purpose.

This IRM Plan establishes initial goals and objectives, defined in Section 2, for managing OSD information resources during the period FY88 – 95. These goals and objectives are aimed at solving the deficiencies noted in Section 4. The Plan also describes a strategy for accomplishing these goals and objectives in two phases of activity: Phase 1 activities are intended to bring OSD OA up to at least mid-1980s technology by FY90. Phase 2 activities move OSD forward to 1990s' OA technology and integrate decision support systems, access to database libraries, and network facilities within the individual workstation-centered OA environment by 1995.

5.1.2 Scope.

This IRM Plan focuses on the planning and programming of Phase 1 activities; it presents only general guidelines for Phase 2. With the IRM Plan, the Director of WHS establishes overall IRM goals and objectives for OSD, issues 5-year information technology budget guidelines, coordinates broad program schedules covering the 5-year period, and sets the direction for supporting OSD mission functions through FY95.

This initial IRM Plan is limited in its functional scope. OMB Circular No. A-130, *Information Resources Management*, defines IRM as the planning, budgeting, organizing, direction, training, and control associated with creation, collection, processing, transmission, dissemination, use, storage, and disposition of information, both automated and nonautomated. This wide scope is intended to centralize the management of all information resources for an enterprise. But the scope of this plan will be limited to ADP, telecommunications, and OA, so as to address those issues within the current responsibility of DCOAR and the OSD component MCOARs.

Although this plan does not concentrate on the management of information, *per se*, it is clear that both the fiat of Federal IRM and the rapid automation of all forms of information management show the need for more centralized management of information and its supporting technical resources. The information-management aspect of IRM is now handled within WHS by the DIOR, DREF, and the DC&D. Subsequent IRM plans should encompass all information resource activities under the Director of WHS. A study should be undertaken to investigate the potential for improved information resource management via consolidation of applicable functions within a WHS IRM directorate, under the leadership of a senior executive. (See Section 5.2.2, Objective 2.5, for further discussion of this recommendation.)

5.2 IRM GOALS AND OBJECTIVES.

IRM goals tell the reader how information resources are to support OSD missions. The objectives are statements of specific results to be attained. This section tells what must be done to achieve each of the OSD goals and objectives.

5.2.1 Goal 1: Provide the AIS Resources Needed for Maximum Productivity by the OSD Staff.

Objective 1.1: Satisfy the general requirements of the OSD staff for information processing capability by means of OA. Provide enough workstations in or near the work areas of staff members.

Acquisition and conversion of the *secure* workstations needed should receive the highest planning priority because processing of classified information is fundamental to most of OSD's mission functions. Of the 1,000 workstations reported as still needed (Section 4.4.1), at least 800 must be able to process classified information. In addition, at least 500 of the 2,000 existing workstations must be converted to the same capability.

Procurement for FY88 – 90 should aim at low-cost workstations, equipped with essential technology only. The principal cause of the shortage of workstations, despite the high level of funding for workstation procurement, appears to be the high price of individual units. Only a small number of users avail themselves of the full capabilities of the Sun and Xerox workstations. It is important to make the distinction between what is technically possible and what is valuable to the organization.

OSD should consider setting in-house standards¹ to limit the acquisition of workstation hardware and software to an interoperable set. Selection of workstations that will provide a reasonable degree of standardization within OSD is difficult when rapidly changing technology leads to changing perceptions of "requirements."

Objective 1.2: Satisfy DSS requirements within and across OSD components. Provide OSD with adequate levels of DSS capabilities. Where feasible, integrate DSS and OA system requirements.

DSS requirements within and across OSD components must be clearly identified. Because DSS depends on the needs of managers and the staff members who assist in preparations for decision-making, identification of DSS requirements should include as broad a view as possible of all OSD decision-making. The sponsors of a comprehensive requirements analysis should include, as a minimum, the two Under Secretaries, the Assistant Secretary for C3I, and the OSD Comptroller. A reasonable task force to direct such an analysis might be made up of appropriate deputy assistant secretaries (or their equivalent) from each of these offices under the chairmanship of the Deputy Assistant Secretary of Defense for Information Resources Management, in the Comptroller's office.

Because substantial organizational changes resulting from the Goldwater-Nichols' management reviews may occur in OSD during the next transition to a new administration, major DSS requirements should be validated by the new executive structure. Any analysis of major DSS requirements should consider the work already done for the Office of the Comptroller, since decision-making involving the Program Budget plays such a large role in many OSD decision-making functions. The best identification of DSS capabilities in OSD has been done for the Office of the

¹To meet internal compatibility objectives, to minimize the need for support of many different kinds of microcomputer hardware and software, and to take advantage of volume procurement discounts, an agency may establish organizationally preferred or approved in-house "standard." When choosing in-house standards, the organization must first determine its requirements, and then choose a set of standards which can fully satisfy those requirements. The resulting in-house "standard" is frequently a list of organizationally approved and supported hardware and software. In the absence of established formal standards, an organization should give serious consideration to choosing in-house standards which conform to *de facto* industry standards. General Services Administration. *A Five Year Plan for Meeting the Automatic Data Processing and Telecommunications Needs of the Federal Government*. June 1985. p. 115.

Comptroller and for some offices within the Office of the Under Secretary of Defense for Acquisition.

An alternative to the systematic and formal definition of requirements proposed above is to provide selected DSS capabilities for review by managers and staff. This supply-oriented approach would depend upon the diffusion of DSS capabilities throughout OSD by demonstration. The DAITC, at the direction of DCOAR, has begun to implement this approach. This approach runs the risk of mis-allocation of resources due to (1) information technologists' inaccurate perception of functional problems to be solved, and (2) the potential for spurious "requirements" being generated as a result of technology demonstrations.

Objective 1.3: Satisfy requirements for large- and medium-scale computational resources within and across OSD components. Provide appropriate levels of access within OSD. Where feasible, integrate these requirements with OA and DSS resources.

OSD should take several specific steps to accomplish this objective. These include the following actions:

- Satisfy requirements for medium-scale computing with OA resources wherever possible.
- Distribute medium-scale computational resources to the using office, consistent with support resource availability.
- Focus training support on these offices, to include assistance in identifying job classifications that may be needed.
- Satisfy requirements for large-scale computing resources with 7CG support or by access to appropriate systems maintained by the DCA, DLA, or Military Services.
- The Director of WHS should work out a new agreement with the Commander of the 7CG for the nature and level of 7CG support of OSD. This agreement should be made in consideration of the most effective replacement of the MULTICS and to allow OSD control of how 7CG resources allocated to OSD are distributed. The Director of WHS, in return, should be responsible for planning and programming funds to be provided to the 7CG for OSD support.

Objective 1.4: Automate distribution of messages between the JCS Information Services Center and OSD directorates.

Place additional emphasis and funding on putting this automated distribution process in place as part of new OA systems as those systems are acquired. Development of this capability is now under way by Wang Laboratories in the Joint Staff area and in the OUSD(P)'s Crisis Coordination Center. Since the JCS Information Services Center serves as the source of this traffic, an agreement with the Director of the Joint Staff could result in assignment of this task to the Joint Staff Director for Information and Resource Management (DIRM).

Achievement of this objective will be most effectively managed under the direction of a WHS Director for IRM, whose authority includes DIOR, DC&D, and DCOAR. The WHS Director for IRM could then coordinate all OSD implementation activities with the Joint Staff DIRM. (See Section 5.2.2, Objective 2.5, for further recommendations regarding these offices.)

5.2.2 Goal 2: Improve Access to Corporate Data through Intercomponent Networking via Gateways and Other Channels that Share Resources among OSD Component Users.

Objective 2.1: Identify information processes and supporting data sets that are common to more than one OSD user or to OSD and the Joint Staff.

DCOAR should augment the current effort on improving interoperability by identifying the information processes and data involved in the major transactions among components. Table 4-1 (Section 4.4.2) could serve as the baseline for this more comprehensive effort. In addition, the description of these transactions should indicate their essentiality to component mission accomplishment.

The products of the foregoing analysis should be used as resources for preparing an OSD Corporate Data Management Plan (Objective 2.5), and developing an information resources directory (Objective 2.6).

Objective 2.2: Develop communications standards and gateway guidelines for providing OSD with access to non-DoD databases and networks.

The Director of WHS should exploit aggressively the development of current standards for more effective guidance of system acquisition.

Recent preparation of a draft Interoperability Plan for OSD has begun to identify communications links needed among components within OSD. The draft plan proposes a second-stage effort to identify linkages required between OSD

components and organizations or systems outside OSD. The necessary identification of external linkages should be accelerated by its inclusion in the first-stage efforts now under way.

DCOAR should coordinate representation of OSD communications needs with DCA in OSI standardization efforts, and near-term development of gateway systems. Since the DAITC is developing an intelligent gateway for DTIC that could serve many OSD users, they should be aware of OSD gateway requirements.

Objective 2.3: Develop an OSD network strategy and schedule for inter-connectivity among:

- Workstations within offices
- Workstation clusters or LANs within each component
- Component LANs across OSD
- OSD network with the Joint Staff, the Military Departments, and Defense agencies.

DCOAR and the IRM Steering Committee should focus their near-term planning efforts on ensuring development of a network strategy before further major acquisitions of information technology take place. The strategy should include a design for a backbone cable system that will enable interconnection of workstation clusters and OSD LANs and provide access to the resources of the 7CG, the JCS Information Services Center, and the DAITC. The backbone cable should also provide connectivity to Military Department networks and other external networks and databases of interest to OSD users. In particular, OSD should consider use of the broadband, backbone cable to be established by the 7CG's HSRP.

The OSD network strategy should identify minimum standards for not only the lower OSI layers, but also for the Presentation and Application layers, so that OSD OA development can take place within an integrated environment. Although Ethernet is now the *de facto* standard within OSD, consideration should be given to other alternatives.

Development of network communications should continue with an eye toward the emerging Government Open Systems Interconnection Profile (GOSIP) standards, which are intended to guide procurement in FY88 and FY89. GOSIP is a subset of the largely OSI-based Technical and Office Protocol (TOP) being developed

under the leadership of the Boeing Corporation. The National Bureau of Standards has taken a conservative approach on what is specified in GOSIP to allow flexibility in procurements. The GOSIP committee will adopt additional protocols as they become available. The TOP protocol suite can suggest protocols in addition to those now addressed by GOSIP.

Network development efforts should be focused on compatibility with GOSIP standards – and with TOP standards where GOSIP standards are lacking.

To focus these diverse efforts and add resource emphasis where it is most needed, a specific interconnectivity project, dedicated to achieving this objective, should be established.

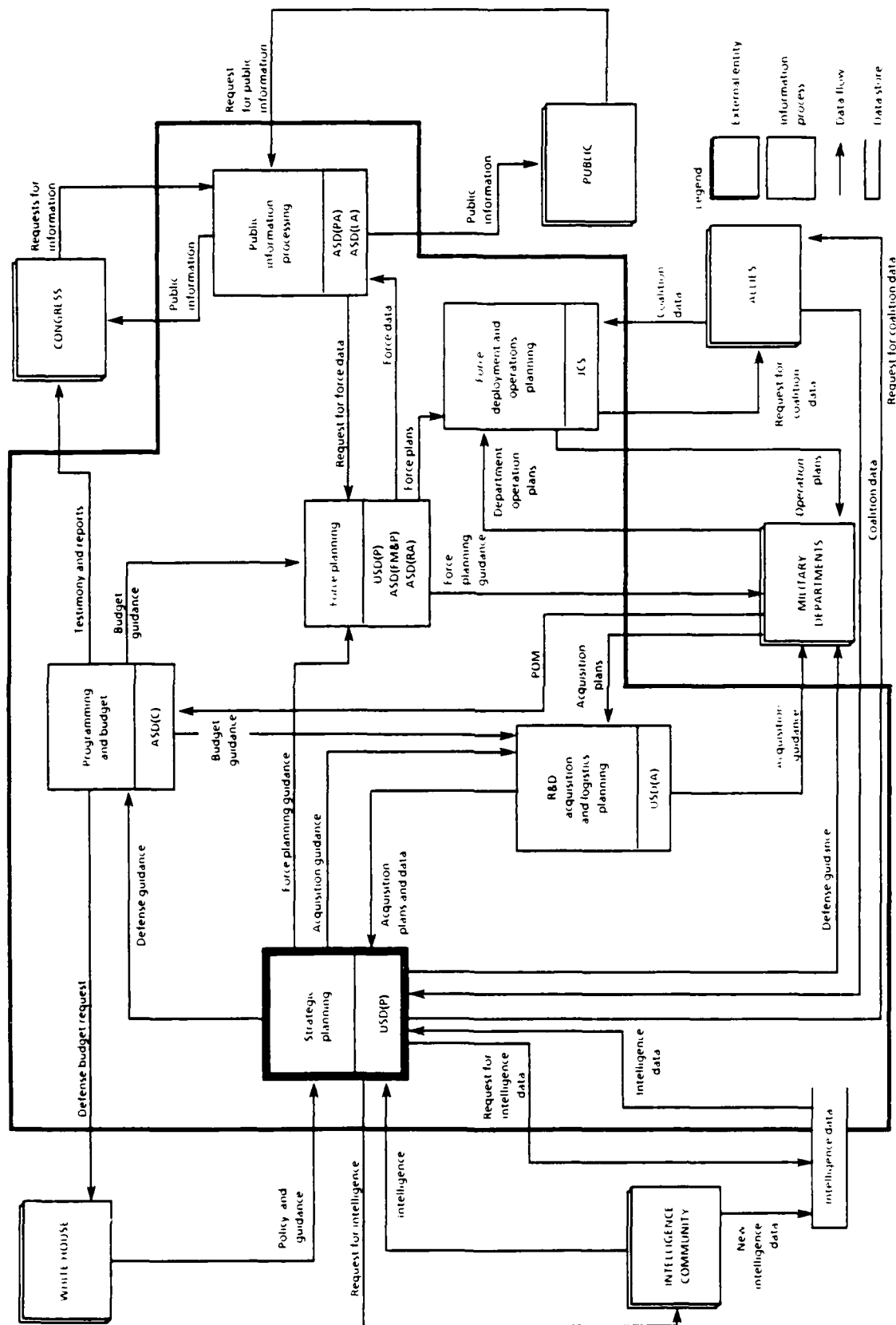
Objective 2.4: Establish criteria for deciding how to manage the corporate data identified from Objective 2.1.

Develop a data dictionary for corporate data and implement data standards, to enable multiple users throughout DoD to have access to common data and reduce data redundancy. The data dictionary should tell the reader how data is organized within OSD databases, so that access to corporate data is made easier, and should provide enough information about each database to enable a potential user to know: (1) data entities (field descriptions), (2) database design (data structure), (3) DBMS being used to manage the database, (4) database storage characteristics (size, and how stored), (5) mission functions and information processes supported, and (6) database administrator contact.

Objective 2.5: Establish an OSD Corporate Data Management Plan that prescribes how corporate data will be collected, maintained, and distributed.

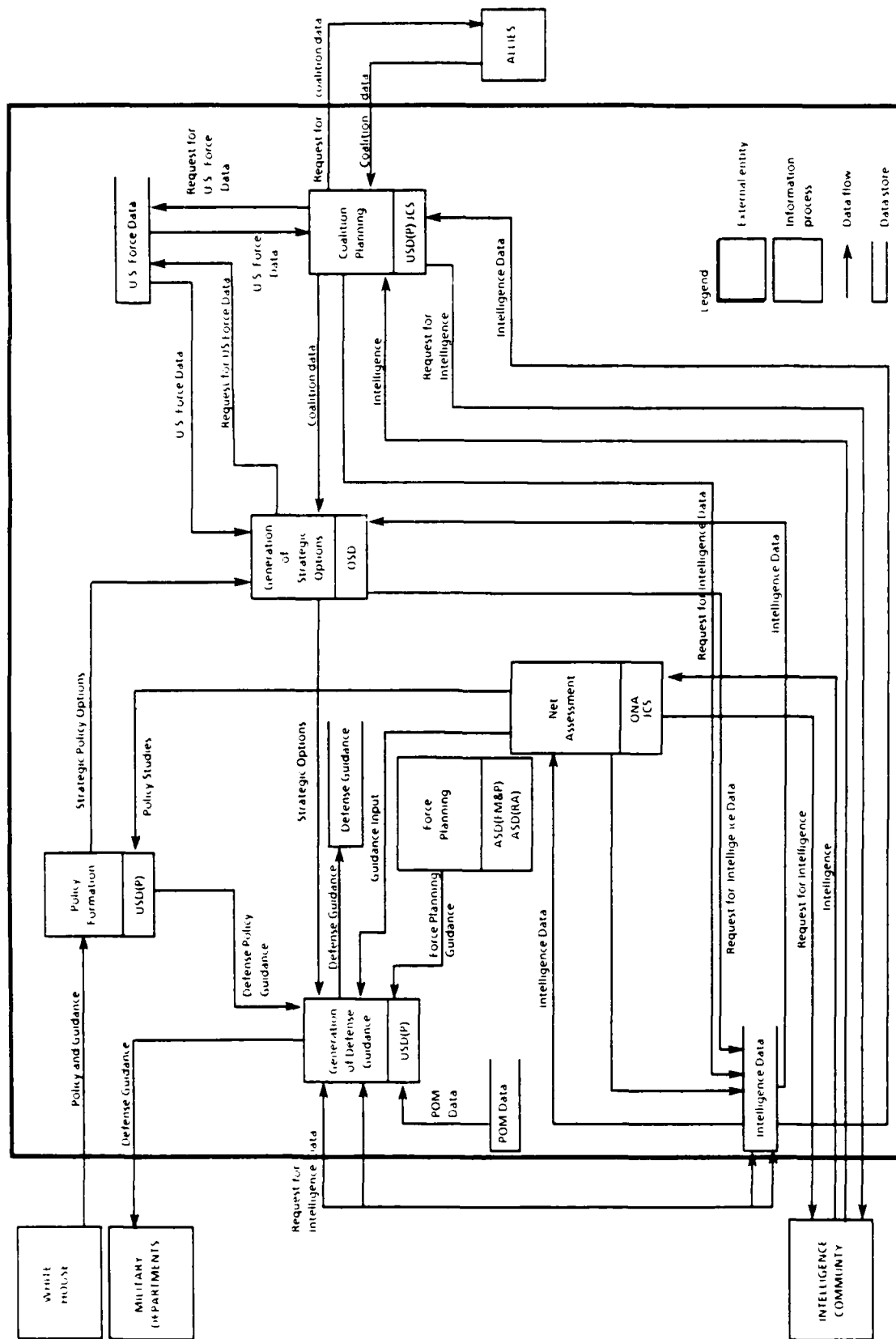
Develop an OSD Corporate Data Management Plan that uses the data dictionary described above and:

- Describes how information processes support component mission functions, and how data sets support information processes. Figure 5-1 is a representative, aggregate-level data flow diagram, that shows how data sets and information processes support DoD mission functions. In the Management Plan, this aggregate description should be refined to account for information processes and data sets at one level lower, at least, than is described in Figure 5-1. Figure 5-2 is a representation of the refinement needed, where one of the processes (Strategic Planning) in Figure 5-1 is "exploded" to portray the processes and data sets within it. Use of an automated



Note For simplicity of presentation, this figure does not contain all of the data stores and data flows that would be contained in a fully described data-flow diagram.

FIG 5-1. DoD INFORMATION PROCESSING



Note: For simplicity of presentation, this figure does not contain all of the data stores and data flows that would be contained in a fully described data flow diagram.

FIG. 5-2. STRATEGIC PLANNING PROCESS

structured analysis tool eases identification of these processes and data sets, and the relationships between them, as well as maintenance of an audit trail.

- Provides a set of objectives that tell what is needed for effective management of data used and produced by OSD.
- Evaluates how effectively these objectives are being approached.
- Establishes an implementation schedule for activities designed to carry out the objectives.

Produce a map of relationships across OSD that can be used to develop and share databases cost-effectively. This map will serve as the baseline for interoperability requirements, network planning, and identification of data storage needs. Collect data for the plan through interviews with component personnel using the structured analysis methodology.

Consolidation of IRM-related functions within one office would streamline data management within OSD and ease preparation of the Data Management Plan. If such a consolidation is not feasible, the Director of WHS should form a Database Administration Committee to establish objectives that will be the basis for the OSD Corporate Data Management Plan. This committee should be co-chaired by DCOAR and DIOR, with members representing components with major database responsibilities. The final plan will contain a set of initiatives aimed at carrying out the objectives and will provide for periodic reviews. DIOR should be responsible for carrying out the plan.

Objective 2.6: Develop an information resources directory for all information technology systems and databases used by OSD components and the JCS, to be made available to all OSD components.

An excellent example of an information resources directory is the annex to the OJCS IRM Plan, prepared for the Director of the Joint Staff. DCOAR should prepare a similar description of information resources for OSD and, in cooperation with the Joint Staff DIRM, develop an aggregate resources directory in automated form. This resources database would serve as a baseline document for information architecture description and development planning.

DCOAR and the IRM Steering Committee should investigate the feasibility of using a computer-aided structured-analysis-and-design tool to compile the data in this information resources directory and to integrate it with the data flow

information prepared for the Corporate Data Management Plan (see Objective 2.5). This will allow OSD planners to design new systems more effectively.

Establishment of a consolidated WHS Director for IRM would speed achievement of this objective.

5.2.3 Goal 3: Make Sure that AISs Provide Necessary Levels of Security.

Objective 3.1: Establish information systems that comply with DoD standards for secure communications within OSD.

The Director of WHS should direct that AI26 be amended to indicate the need for continued improvement of system security and the need for constant evaluation of the cost-effectiveness of security standards and measures.

AI26 should be augmented with appropriate guidelines from NSA or the DCSC on the subject of multilevel security.

Objective 3.2: Establish an OSD TEMPEST standard that implements DoD "burden of proof" policy, that is, not requiring TEMPEST standards unless a specified need is demonstrated.

The Director of WHS should direct that AI26 be amended to reflect DoD policy to place the burden of proof for TEMPEST requirements on identification of a specific threat. DCOAR and DREF should coordinate implementation of instructions and guidelines to be issued to OSD components.

Objective 3.3: Comply with trusted computer software standards when establishing OSD information systems.

The recommended architecture for OSD requires that each network management center (NMC) serve as the focal point for ensuring that trusted computer system standards are observed for its local network. If the 7CG is designated as the administrator of the backbone network that serves all OSD subnetworks, then the 7CG should be the designated approving authority for accreditation of all OSD network systems.

The purpose of Objective 3.3 should be integrated with the aims of Objectives 3.1 and 3.2.

Objective 3.4: Establish OSD information systems so as to comply with DoD standards for multilevels of secure processing.

This objective should be integrated with Objective 3.1, and the technology effort should be allocated to Objective 4.2.

5.2.4 Goal 4: Make Sure that Advanced Technology is Used When Appropriate to Achieve Mission Goals and Reduce Costs.

Objective 4.1: Identify new AIS technologies and analyze their applicability to DoD needs.

Requirements for projects to assess new technologies or develop prototype applications of new technologies should be systematically collected from the OSD user community, and reviewed within the same process used to validate other information technology requirements. This includes conducting a benefit-cost analysis as described in AI56.

Training facilities should be improved for use toward coordinating OSD-wide training.

Objective 4.2: Analyze and test prototype LAN interfaces and protocols to improve OA compatibility.

Improve OSD OA systems by analyzing and testing prototype LAN interfaces and protocols aimed at improving the compatibility of separate component OA systems to share data and exchange document files. (This is linked to Objective 2.3 and Goal 2.)

Continue to monitor technological developments in the area of multilevel security for automated systems and recommend, in coordination with the 7CG, appropriate directions for future systems acquisition.

5.2.5 Goal 5: To Reduce Cost, Plan for and Manage the Acquisition and Operations of AISs.

Objective 5.1: Establish 5-year strategic AIS IRM Plans for OSD and for every OSD component.

Since most of the major OSD components already have their own strategic IRM or AIS planning underway, DCOAR should provide further specialized help to offices that need it. DCOAR could most appropriately provide direct planning assistance to sister offices in WHS and a few of the very small OSD offices, such as Intelligence Oversight, Test and Evaluation, Executive Secretariat, Legislative Affairs, and the General Counsel's Office. Some of the major OSD components need more staff to

meet the increasing need for a dedicated MCOAR, or an MCOAR staff, to implement IRM planning requirements properly. The OUSD(P), the OUSD(A), and the OASD(C3I) are examples of these respective needs.

Objective 5.2: State, within AI56, a centralized approach and a process for OSD AIS IRM planning, programming, and budgeting.

Publish the IRM working instruction that was developed as part of the IRM Workshop in June 1986, as an enclosure to a new AI56, *Computer and Office Automation Resource Administrative Instruction*. This working instruction, now being followed as an informal guide, sets a centralized approach for IRM planning, programming, and budgeting.

Organize *ad hoc* committees from the membership of the IRM Working Group (MCOARs), similar to the Steering Committee, as needed to coordinate accomplishment of appropriate activities in support of this plan.

Strengthen IRM strategic planning through the PPBS process so that multi-year informational needs may be developed and coordinated. The Director of WHS should establish a formal process of planning and programming for information resources that involves other OSD senior managers. A recommended process is the one involving an IRM Planning Board, presented in the IRM Workshop, and briefed to the Director of WHS in mid-1986. Consolidation of IRM responsibilities under a WHS IRM Director would provide staff assistance more effectively to such an IRM Planning Board.

WHS should promulgate reasonable and firm standards for requirements, benefit-cost analysis, and a process for validating them during the planning and programming cycle. At a minimum, OSD should make sure that the standards promulgated in the FIRMR are applied to OSD requirements. The Director of WHS should establish an explicit process for validation of requirements; the process should stress active participation by senior managers. Validated requirements should be tracked through budget submission and execution. Although most of the requirements would be addressed in the planning and programming portion of the annual PPBS cycle, a process for dealing with unprogrammed essential requirements is also needed. There is now no formal structure for validating requirements. Consolidation of IRM responsibilities under a senior IRM Director would strengthen WHS management of an appropriate structure.

Objective 5.3: Within AI56, state guidelines and component-level quality-control procedures for:

- Adequate analysis and justification of requirements
- System life-cycle management with cost amortization
- Exploration of market alternatives
- Benefit-cost analysis that incorporates information technology costs with other costs to site, operate, and maintain an OA system.

In cooperation with other WHS directorates, develop a "total systems benefit and cost" methodology that includes identifying noninformation technology support costs to properly site, operate, and maintain any OA system.

Develop guidelines and procedures for quality control within a revised AI56. Appendix F provides guidelines for preparing AIS project requests and supporting documentation, including a cost-benefit analysis. This is an example of the type of guidance that should be published in AI56. Table 5-1 summarizes the present status of progress toward meeting each objective and the recommendations for achieving each objective.

5.3 A LONG-TERM IRM STRATEGY FOR OSD.

5.3.1 The View Toward 1995.

5.3.1.1 Suggested Schedule for Completing Initiatives.

Information resources in support of the OSD mission are costly, and careful attention should be paid to managing them. IRM goals and objectives describe what OSD should do to provide the technology needed to meet its information requirements. To achieve these IRM goals and objectives, OSD should undertake initiatives that establish target completion times and, where appropriate, milestones for completing each initiative. Many initiatives required to meet objectives identified here have already been started.

This section provides recommended timing for completion of initiatives that support IRM goals and objectives. The recommended timing is shown in Figure 5-3. All initiatives should adhere to the schedule as closely as possible. The schedule was derived based on the interrelationship of the stated OSD goals and objectives. For example, common processes and data must be identified, the data management plan

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES

Goal 1: Provide the AIS resources needed for maximum productivity by the OSD staff.		
Objectives	Findings	5-year plan recommendations
Objective 1.1: Satisfy general requirements of the OSD staff for office automation information processing capability. Set up enough workstations in or near the members' staff work areas to meet the needs of users.	There is a shortage of workstations, particularly workstations capable of processing classified material. Not enough money is available for all the workstations needed. Most OSD users have workstations with more capability than they can use.	Acquisition of secure workstations should receive the highest priority. Procurement for FY88-89 should aim at low-cost workstations equipped with essential technology only.
	TEMPEST equipment is costly and TEMPEST limitations often degrade performance. (See Goal 3.) There is inadequate attention to interoperability requirements when establishing systems.	OSD should consider setting standards to limit acquisition of hardware and software to an interoperable set.
Objective 1.2: Satisfy DSS requirements within and across OSD components. Provide OSD with adequate levels of DSS capabilities. Where feasible, integrate DSS and OA system requirements.	Most requirements analyses do not provide for integration of decision support tools within the OA workstation environment.	DSS requirements within and across OSD components must be clearly identified, with as broad a view as possible of all OSD.

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 1: Provide the AIS resources needed for maximum productivity by the OSD staff (Continued)		
Objectives	Findings	5-year plan recommendations
<i>Objective 1.2 (Continued)</i> <i>Objective 1.3:</i> Satisfy requirements for large- and medium-scale computational resources within and across OSD components. Provide appropriate levels of access within OSD. Where feasible, integrate these requirements with OA and DSS resources.	Managers have not yet adequately analyzed their own information needs, nor have DSS capabilities been fully assessed for their application to individual staff needs. OSD offices have few large databases to store or manage. With the exception of the databases related to FMS, FORDTIS, and the Program Budget and Defense Acquisition Management, OSD databases are small enough to be managed in-house with current OA systems technology and additional staff or to be maintained by outside agencies or contractors.	Comprehensive requirements analysis should include the two Under Secretaries, ASD(C3I), and ASD(C). An alternative to systematic and formal definition of requirements is to provide selected DSS capabilities for demonstration and review. Satisfy requirements for medium-scale computing with OA resources wherever possible. Distribute medium-scale computational resources to the using offices consistent with resource availability. Satisfy large-scale computing requirements with 7CG support or by access to appropriate systems maintained by DCA or the Military Services.

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 1: Provide the AIS resources needed for maximum productivity by the OSD staff. (Continued)		
Objectives	Findings	5-year plan recommendations
Objective 1.3 (Continued)	Because 7CG support to OSD is organized by component projects, without overall OSD supervision, there is no effective means of optimizing the distribution of an already inadequate level of 7CG support. The 7CG is now at 80-percent strength.	Revise the Memorandum of Understanding between the 7CG and OSD to allow OSD control over how 7CG resources allocated to OSD are distributed.
Objective 1.4: Automate distribution of messages between the JCS Information Services Center and OSD directorates.	The most important OA capability in many OSD offices, after word processing, is automated distribution of incoming JCS message traffic to individual workstations.	Place additional emphasis and funding on an automated distribution capability for new OA systems

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 2: Improve access to corporate data through intercomponent networking via gateways and other channels that share resources among OSD components.	Objectives	Findings	5-year plan recommendations
	Objective 2.1: Identify information processes and supporting data sets that are common to more than one OSD user or to OSD and the Joint Staff.	The effort aimed at identifying OSD interoperability requirements is focused on communications needs among OSD components without identifying those needs in terms of their information content.	DCOAR should augment the current efforts on improving interoperability by identifying the information processes and data involved in the major transactions among components. The description of these transactions should indicate their essentiality to component mission accomplishment.
	Objective 2.2: Develop communications standards and gateway guidelines for providing OSD with access to non-DoD databases and networks.	DCA is coordinating an effort to develop standards of interoperability, but standards will probably not be implemented for 5 to 10 years. Military Services and agencies are developing their own gateway systems that offer access in the near-term to databases and networks of particular interest. This trend may proliferate unique gateway architectures that could create obstacles for eventual conversion to more standardized methods of access. Further, the commercial sector provides access to a multitude of databases and manages a number of Government databases for Federal clients.	The Director of WHS should exploit development of current standards aggressively for more effective guidance of system acquisition. A second-stage effort is needed to identify links required among OSD components and organizations or systems outside OSD. The necessary identification of external links should be accelerated by its inclusion in the first-stage effort now under way.

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 2: Improve access to corporate data through intercomponent networking via gateways and other channels that share resources among OSD components. (Continued)		
Objectives	Findings	5-year plan recommendations
Objective 2.2 (Continued)	Insofar as this trend is not subject to standardization or coordination, user agencies will have even greater incentive to proliferate unique gateways, also exacerbating eventual conversion problems.	Through the DAITC, DCOAR should coordinate OSD's communication needs with DCA in standardization efforts and near-term development of gateway systems.
Objective 2.3: Develop an OSD network strategy and schedule for interconnectivity among: • Workstations within offices • Workstation clusters or LANs within each component • Component LANs across OSD • OSD network with the Joint Staff, the Military Departments, and Defense agencies.	An OSD network strategy should be based on a clear identification of interoperability requirements. The current development of a draft Interoperability Master Plan is a useful vehicle for identifying these requirements, examining alternative network strategies, and proposing a schedule of implementation. Current LAN standards are being established within OSD by <i>de facto</i> adoption of Ethernet by the Comptroller and an increasing number of OUSD(P) and	DCOAR and the IRM Steering Committee should focus their near-term planning efforts on ensuring development of a network strategy before further major acquisitions of information technology take place. The strategy should include a design for a backbone cable system that will enable interconnection of workstation clusters and LANs and provide access to the resources of the 7CG, the JCS Information Services Center, and the DAITC. The backbone cable should also provide connectivity to Military Department networks and other external networks and databases of interest to OSD users.

TABLE S-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 2: Improve access to corporate data through intercomponent networking via gateways and other channels that share resources among OSD components. (Continued)		
Objectives	Findings	5-year plan recommendations
Objective 2.3 (Continued)	OUSD(A) offices. Ethernet appears to have been adopted, not because it has been identified as the best future solution for networking OSD OA applications, but because there is already an established base of Xerox and DEC Ethernet capabilities that can be quickly augmented to provide low-level "gateway" communications in the near term.	The OSD network strategy should identify minimum standards for not only the lower OSI layers, but also for the Presentation and Application layers, so that OSD OA development can take place within an integrated environment. Although Ethernet is now the <i>de facto</i> standard within OSD, consideration should be given to other alternatives.
	The 7CG HSRP that is intended to replace the Honeywell MULTICS provides for a broadband, backbone cable that might serve as the hub for OSD component LANs.	Development of network communications should continue with an eye toward the emerging GOSIP standards, which are intended to guide procurement in FY88 and FY89. OSD should consider use of the broadband, backbone cable to be established by the 7CG's HSRP.

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 2: Improve access to corporate data through intercomponent networking via gateways and other channels that share resources among OSD components (Continued)		
Objectives	Findings	5-year plan recommendations
<i>Objective 2.3 (Continued)</i> <i>Objective 2.4: Establish criteria for deciding how to manage the corporate data identified from Objective 2.1.</i>	This objective appears to be significantly underfunded, although interconnectivity funding is embedded in a number of projects associated with other objectives. The aggregated mappings of major data sets, processes, and organizations developed to accomplish Objective 2.1 is not defined in enough detail to support accomplishment of this objective.	To focus OSD's diverse efforts and add resource emphasis where it is needed most, a specific interconnectivity project, dedicated to achieving this objective, should be established. Develop a data dictionary for corporate data and implement data standards, to enable multiple users throughout DoD to have access to common data and reduce data redundancy.

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 2: Improve access to corporate data through intercomponent networking via gateways and other channels that share resources among OSD components. (Continued)			
Objectives	Findings	5-year plan recommendations	
Objective 2.5: Establish an OSD Corporate Data Management Plan that describes how corporate data will be collected, maintained, and distributed.	This objective is unfunded as an information project, although it is being managed implicitly under OASD(C) as part of its function to manage DoD systems and manage and control DoD information requirements. Achieving this objective requires close coordination with the OASD(C) in support of their current efforts to establish database management policy.	Develop an OSD Corporate Data Management Plan that describes how information processes support component mission functions, and how data sets support information processes; provides a set of objectives that tell what is needed for effective management of OSD data; evaluates how effectively these objectives are being approached; and establishes an implementation schedule for activities designed to carry out the objectives. Produce a map of relationships across OSD that can be used to develop and share databases cost-effectively. Consider consolidating DIOR, DCOAR, and DC&D to streamline data management. If this is not feasible, form a Database Administration Committee to establish objectives that would be the basis for the Plan.	

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 2: Improve access to corporate data through intercomponent networking via gateways and other channels that share resources among OSD components. (Continued)		
Objectives	Findings	5-year plan recommendations
Objective 2.6: Develop an information resources directory for all information technology systems and databases used by OSD components and the JCS, to be made available to all OSD components.	There is a need for development of an information resources directory that includes a description of all AISs and databases used by OSD components and the JCS, with methods of accessing the resources. Also needed is a centralized inventory of all OSD AISs and related resources, identifying for each system: • Its common name • Databases in the system • Users • Who is responsible for its use • General configuration of equipment • Available interfaces • Major sources from which databases have been developed • Annual operating costs (so that the inventory may also serve as a basis for budget planning and control).	DCOAR should prepare an information resources directory like the annexes to the OJCS IRM Plan, and, in cooperation with the Joint Staff DIRM, develop an aggregate resources directory in automated form. DCOAR and the IRM Steering Committee should investigate the feasibility of using a computer-aided structured-analysis-and-design tool to compile the information resources directory and integrate it with the data flow information prepared for the Corporate Data Management Plan.

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 3: Make sure that AISs provide necessary levels of security.		
Objectives	Findings	5-year plan recommendations
Objective 3.1: Establish information systems that comply with DoD standards for secure communications within OSD.	Some AIS security standards established in the AI26 supplement to DoDD 5200.1-R, <i>Department of Defense Information Security Program Regulation</i> are insufficient to guide the secure development of OSD information systems. Substantial additional guidance from the DCSC is needed. Technology is changing at a rate that makes it difficult to establish stable security standards for automated systems.	The Director of WHS should direct that AI26 be amended to indicate the need for continued improvement of system security and the need for constant evaluation of the cost-effectiveness of security standards and measures.
Objective 3.2: Establish an OSD TEMPEST standard that implements DoD "burden of proof" policy, that is, not requiring TEMPEST standards unless a specific need is demonstrated.	OSD security standards in AI26 do not accord with DoD policy that the burden of proof for TEMPEST requirements should be based on determination of a specific threat.	AI26 should be augmented with appropriate guidelines from NSA or the DCSC on the subject of multilevel security. The Director of WHS should direct that AI26 be amended to reflect DoD policy to place the burden of proof for TEMPEST requirements on identification of a specific threat. The Director for Space Management and Services and DCOAR should coordinate implementation of instructions and guidelines to be issued to OSD components.

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 3: Make sure that AISs provide necessary levels of security. (Continued)		
Objectives	Findings	5-year plan recommendations
Objective 3.3: Comply with trusted computer software standards when establishing OSD information systems.	The evolution of OSD networks will likely preclude accreditation of the total system as a "Single Trusted System," as described in NCSC-TG-005. It is likely that OSD networks will have to be evaluated under an "interconnected, accredited AIS view" which recognizes that parts of the overall network system may be independently created, managed, and accredited. Since OSD OA systems are principally microcomputer systems, their inherent weaknesses in providing hardware and software controls will continue to require reliance on appropriate physical, personnel, and procedural controls.	The recommended architecture for OSD requires that each network management center serve as the focal point for ensuring that trusted computer system standards are observed for its local network. As the designated administrator of the backbone network that serves all OSD subnetworks, the 7CG should be the designated approving authority for accreditation of all OSD network systems.
Objective 3.4: Establish OSD information systems so as to comply with DoD standards for multilevels of secure processing.	The limited hardware/software sophistication of microcomputer-based OA systems generally precludes the ability of the system to provide multiple levels of security. Separate OA LANs will, therefore, have to be provided for dedicated levels of security operation for the foreseeable future.	Integrate this Objective with Objective 3.1. The technology effort should be allocated to Objective 4.2.

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 3: Make sure that AISs provide necessary levels of security (Continued)		
Objectives	Findings	5-year plan recommendations
<i>Objective 3.4 (Continued):</i>	The 7CG is considering alternative solutions to the multilevel security issue for medium- and large-scale computing requirements within the context of the HSRP.	

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 4: Make sure that advanced technology is used when appropriate to achieve mission goals and reduce costs.			
Objectives	Findings	5-year plan recommendations	
Objective 4.1: Identify new AIS technologies and analyze their applicability to DoD needs.	The methods for determining which technologies and applications are to be analyzed are not clearly established, nor are they subject to a systematic process of selection. Technology assessments and prototyping are being conducted by both the DoD components and agencies and by DAITC. Although there are training facilities and contractors at the DAITC, these resources are not well integrated to support information technology training requirements across OSD.	Requirements projects to assess new technologies or develop prototype applications of new technologies should be systematically collected from the OSD user community and reviewed with the same process used to validate other information technology requirements. This includes conducting a benefit-cost analysis as described in AI56. Training facilities should be improved for use toward coordinating OSD-wide training.	

TABLE 5-1
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 4: Make sure that advanced technology is used when appropriate to achieve mission goals and reduce costs.		
Objectives	Findings	5-year plan recommendations
Objective 4.2: Analyze and test prototype LAN interfaces and protocols to improve OA compatibility.	This objective emphasizes the importance of interconnectivity and interoperability in OSD.	Improve OSD OA systems by analyzing and testing prototype LAN interfaces and protocols aimed at improving the compatibility of separate component OA systems to share data and exchange document files with guidelines for acquisition. Continue to monitor technological developments in the area of multilevel security for automated systems and recommend, in coordination with the 7CG, appropriate directions for future systems acquisition.

TABLE 5-1

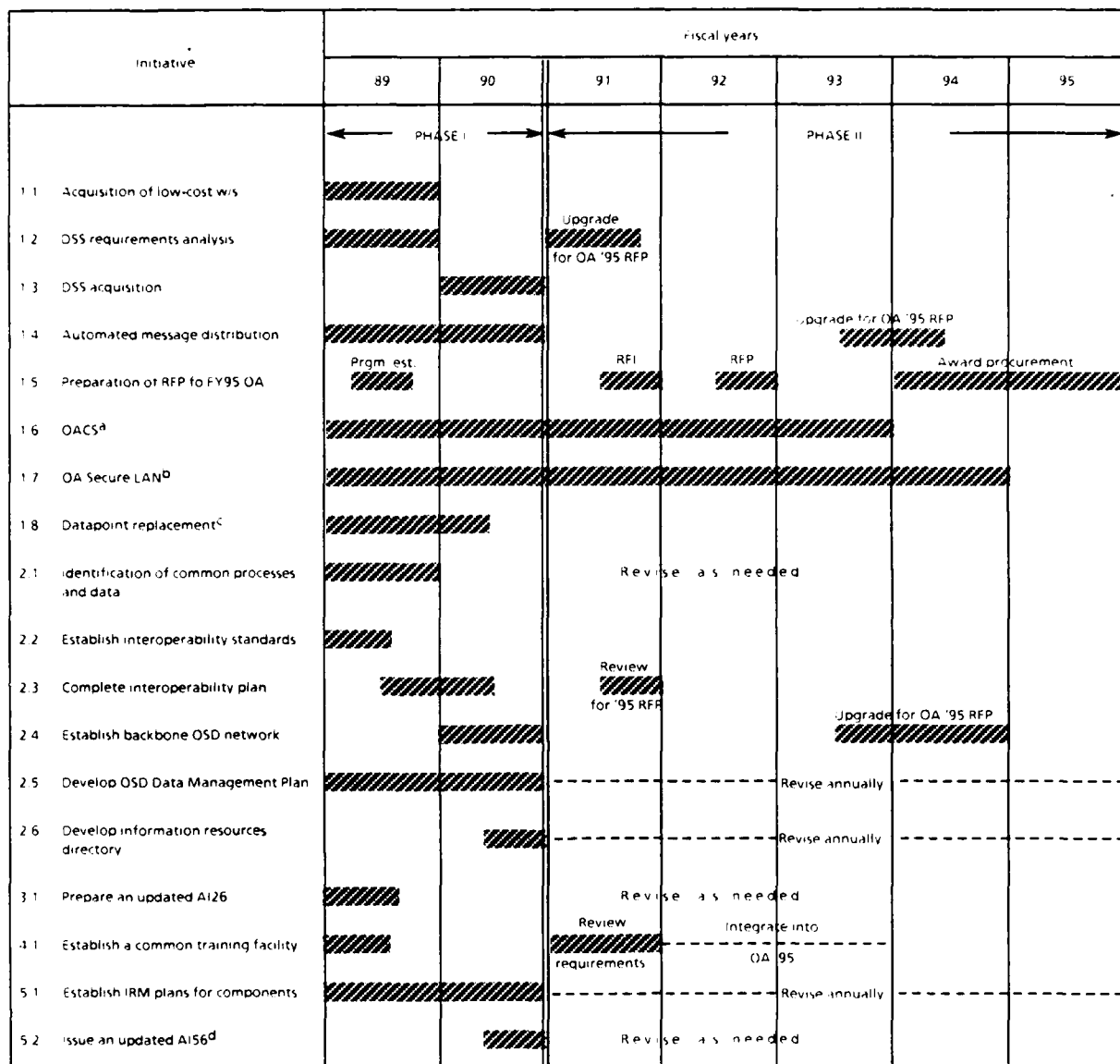
RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 5: To reduce cost, plan for and manage the acquisition and operations of AIFs.		
Objectives	Findings	5-year plan recommendations
Objective 5.1: Establish 5-year strategic AIS IRM Plans for OSD and for every OSD component.	The new DoDD 7740.2 requires each OSD component to implement AIS strategic planning. This planning must interface with the existing PPBS and address total information needs over the period covered by the FYDP. DoDD 7740.2 is targeted only at that part of IRM that deals with information technology management. The other part of IRM, information management, is not addressed. The present strategic planning process does not have adequate involvement of senior managers in developing or prioritizing requirements for information technology.	Since only the major OSD components have their own strategic IRM or AIS planning under way, DCOAR should provide further specialized help to offices that need it. Some of the major OSD components should assign additional staff to meet the increasing need for a dedicated MCOAR, or an MCOAR staff, to implement IRM planning requirements properly.
Objective 5.2: State, within Administrative Instruction No. 56, a centralized approach and a process for OSD AIS IRM planning, programming, and budgeting.		DCOAR should publish the IRM working instruction from the June 1986 IRM Workshop. This instruction sets a centralized approach for IRM planning, programming, and budgeting. The Director of WHS should establish an explicit process for validation of requirements; the process should stress active participation by senior managers. Organize <i>ad hoc</i> committees of MCOARs, as needed, to coordinate accomplishment of appropriate activities in support of this plan.

TABLE 5-1

RECOMMENDATIONS TO MEET GOALS AND OBJECTIVES (Continued)

Goal 5: To reduce cost, plan for and manage the acquisition and operations of AISs. (Continued)		
Objectives	Findings	5-year plan recommendations
Objective 5.3: Within AI56, state guidelines and component-level quality-control procedures for: • Adequate requirements analysis and justification • System life-cycle management with cost amortization • Exploration of market alternatives • Benefit-cost analysis that incorporates information technology costs with other costs to site, operate, and maintain an OA system.	OSD has no local guidelines or standards for preparing and evaluating information requirements. Neither is there a formal structure for validating requirements. This is the single most important technical issue that must be resolved during the planning and programming cycle.	In cooperation with other WHS directorates, develop a "total systems benefit and cost" methodology that includes identifying nontechnology support costs to properly site, operate, and maintain any OA system. Develop guidelines and procedures for quality control. Appendix F provides guidelines for preparing AIS project requests and supporting documentation, including a cost-benefit analysis.



^a Office Automation Computer System

^b Office Automation Secure Local Area Network (RFI dated June 1987, RFP scheduled for late 1987)

^c Datapoint system to be replaced out of OACS and/or OA Secure LAN contracts

^d Assuming an initial update will be completed in early FY88

FIG. 5-3. PROPOSED STRATEGIC INITIATIVES SCHEDULE

must be started, and interoperability standards must be agreed upon before a workable interoperability plan can be developed. Additional criteria included providing for continued information technology support to OSD missions beyond the present strategic planning window.

5.3.1.2 Management of Information and Information Resources.

If the information activities planned for FY88 – 92 are modified as recommended in Section 5.2, they will serve as the basis for an IRM planning and programming structure for OSD that will last for the foreseeable future. However, results from the recommended study on consolidation of IRM-related functions under a Director for IRM could bring about organizational changes that would ease IRM planning.

The initial development of electronic exchange of documents and data between components, scheduled to take place in FY88 – 92, will create a number of issues requiring managerial coordination. These issues are likely to promote early establishment of a forum at which senior executives can begin to participate directly in IRM planning and programming. The Director of WHS should plan for the establishment of that forum. Since the issues to be addressed will be concerned with the support that information management gives to each component's overall mission functions, Principal Staff Assistants should be represented by their principal deputies.

5.3.1.3 Information Technology Architecture.

By FY92, the evolving collection of component LANs will be linked to a broadband, backbone cable that will permit electronic exchange of documents and data among components at the workstation level. By FY93, the microcomputer-based inventory (acquired by FY88) will reach the end of its fully productive life, and a major turnover in workstation inventory will be due.

Although information technology acquired in FY89 and FY90 under the Xerox replacement contract being sponsored by OUSD(A) will still have several years of fully productive life left, that inventory will reflect mid-to-late 1980s technology. In FY93 – 95, therefore, OSD managers will have an opportunity to acquire a new technology architecture that will support information processing to at least the year 2000.

Planning for that architecture should begin in FY88, followed, in FY89, by initial program cost estimates. Since it is clear that 1990s technology and communication standards will allow acquisition of standardized workstations with fully integrated processing capabilities, OSD managers should consider a

centrally coordinated acquisition effort. Different application needs can be met with different software capable of exchanging input and output data with each other.

Because the communications technology that will be available in the 1990s is not clearly known, the future information technology architecture shown in Figure 5-4 still reflects the underlying foundations that are now being put in place. It is likely that the FY95 architecture will no longer be a collection of component architectures, but a single system with application differences accommodated by the individual workstations.

5.3.2 Management Methods.

The strategy for continuing progress in managing information resources through 1995 should rely on the same methods as those proposed for attaining the goals and objectives discussed above:

- Involve senior executives in IRM planning and programming. The "establishment of strong centralized policies implemented through highly decentralized management structures," emphasized by David Packard in the Foreword to his commission's *Report to the President on Defense Management*, is possible only with direct participation by senior managers.
- Appoint IRM project or program coordinators for projects that support multiple components or are aimed at achieving broad OSD IRM objectives. DCOAR and the IRM Steering Committee should task project managers with appropriate objectives.
- Form working groups for other purposes. DCOAR and the IRM steering committee should coordinate the strategy, with guidance from the Director of WHS.
- Develop a target architecture that will meet OSD's IRM goals and objectives and maintain that architecture as a living structure for planning that can change to meet new circumstances. Section 5.3.3 recommends an initial target architecture.
- Maintain AI56 as a central and comprehensive source of guidelines and procedures that will ease management of information resources.
- Establish a review program, in coordination with the PPBS, to measure IRM accomplishment annually against IRM goals and objectives; the results should be used to update the IRM Plan.

Figure 5-3 shows a tentative vehicle for implementing the foregoing goals and objectives, and preparing for major acquisitions.

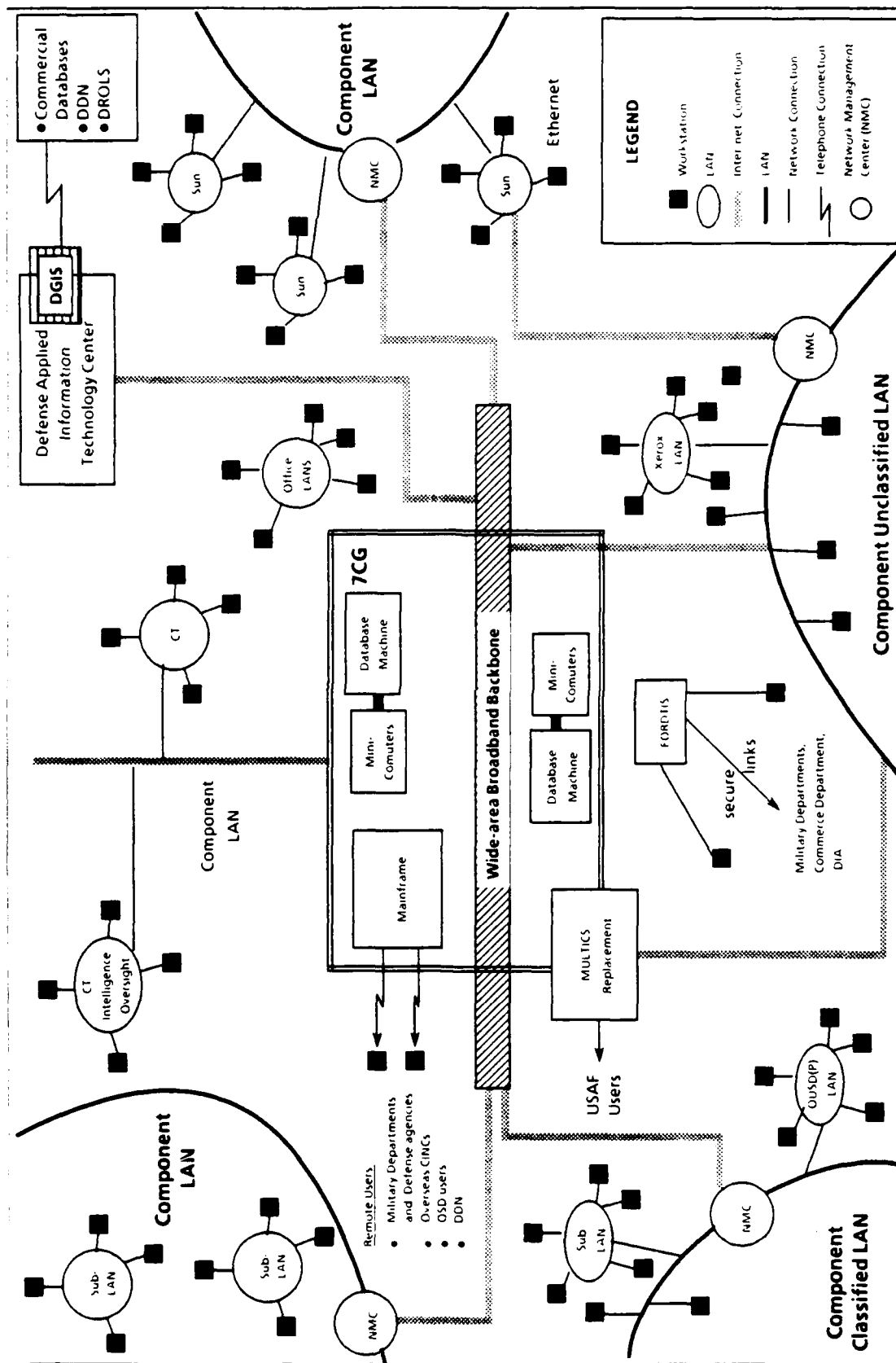


FIG. 5-4. OSD TARGET ARCHITECTURE FOR FY95

5.3.3 A Target Information Technology Architecture.

The OSD architecture will provide expanded support for current applications, as well as growth for new OSD functions and applications. The architecture that will evolve as current projects are implemented is based on a strategy to link workstations in component work areas to the computing capabilities and data that users need. Figure 5-4 shows the target architecture as it could evolve by 1995 from that shown earlier in Figure 3-1. The major components of the newer OSD architecture are:

- *Network Management Centers.* Network management centers in DCOAR, OSD(C), and other large OSD components will support area networking, database, and communication needs for their departmental systems. These NMCs will be controlled directly by appropriate component managers.
- *Wide-Area, Broadband Communications Backbone.* The present Ethernet backbone will be replaced by a broadband backbone capable of handling all forms of information. Gateways will still be used to link users to other networks and outside systems, but common adoption of OSI standards will generally allow access without any need for specialized gateways. This communications backbone will be controlled by WHS. The Joint Staff will provide OSD components with distributed message processing and secure voice transmission. The 7CG or DCA will continue to be responsible for operation and maintenance and will retain operational responsibility for large-scale processing resources tied to the backbone.
- *Office Automation Workstations.* OA workstations will integrate word processing, decision support, and data access within a hypertext environment. Most medium-scale processing capabilities will also have migrated to these workstations by the early 1990s.
- *Large-Scale Processing Facilities.* The 7CG computers will be the principal external data processing facility supporting OSD. Some large OSD databases and models will be supported.
- *Mass Storage and Retrieval Devices.* DCOAR will manage some database machines and optical storage devices that support multiple components. Network management centers and some other components with large processing requirements, storage requirements, or both, will have their own devices.
- *Applied Information Technology Center.* The DAITC will research, test, and acquire new information technology pertinent to OSD needs and will develop systems to meet OSD needs.

- *Executive Decision Support Centers.* Executive Decision Support Centers will be giving way to managerial workstations with similar capabilities.

5.3.4 Acquisition Strategy.

The OSD architecture will develop through an evolutionary acquisition strategy. The essential characteristic of evolutionary acquisition is that system definition evolves in stages, instead of being fully defined when the first stage is complete. This process is appropriate for the OSD architecture because major components of the architecture that will be expanded or replaced during the period of this plan include communications and mass storage devices, two areas in which technology is likely to change during this acquisition. The recommended timing of major acquisitions is shown in Figure 5-3.

5.3.5 Review Process.

The responsibility for future review of this plan will depend on whether the Director of WHS decides in favor of consolidation of IRM-related functions or if IRM-related management responsibilities will continue to be delegated to DCOAR, DIOR, DREF, and DC&D. In either case, the review will determine how well OSD (1) is meeting selected IRM goals and objectives; (2) is complying with established IRM policies, procedures, principles, standards, and guidelines; and (3) is meeting the responsibilities specified in 4 U.S.C. 3506, assuring delegation of proper levels of acquisition authority for ADP resources.

5.3.5.1 MCOAR Preparation of Annual AIS IRM Plans.

The first IRM review starts with preparation of component AIS IRM plans in accordance with DoD 7740.2. In future years, it will begin with review of the prior year's plan. Using mission goals set by Principal Staff Assistants and further refined within the components, each MCOAR can determine what information is needed to accomplish all components' mission goals. After a review of existing information resources and approved information technology projects, the MCOAR

can determine requirements for additional automated support to meet mission information needs. As a result of this review, the MCOAR should develop and coordinate these with the Principal Staff Assistant:

- IRM goals and objectives for the component
- A strategy for achieving the goals and objectives and for managing component AISs
- Areas in which present commitments and planned AISs fail to meet mission needs
- A prioritized set of information technology projects that will be the component POM submission.

Each MCOAR will also review the prior year's OSD IRM goals and objectives, description of commitments and plans, and strategic plan, and will recommend changes to the Director of IRM or DCOAR.

5.3.5.2 Preparation of the Draft Annual IRM Plan.

DCOAR will review, with the IRM Steering Committee, the prior year's plan and the component comments before the annual budget call by the DoD Comptroller. With regard to IRM goals and objectives, the group will (1) eliminate from the plan those deemed inappropriate for the coming year; (2) refine, as required, those to be carried forward, and, as required; (3) develop new ones. The group will incorporate these IRM goals and objectives for the current POM cycle, align projects with the goals and objectives, and prioritize the projects. DCOAR will prepare the draft OSD IRM Plan using Sections 3, 4, and 5 of this report as a guide.

5.3.5.3 Review Under a WHS Director for IRM.

The process explained in this section will occur only if a WHS Director for IRM is appointed. The WHS Director for IRM, who will be responsible for conducting the IRM program review, will coordinate directly with the DoD Comptroller's staff to make sure that this review is conducted in accordance with the latest guidance from OMB and the General Services Administration (GSA).

The review will be conducted as an integral part of the planning and programming phase of the PPBS cycle. Although biennial budgets limit this formal POM process to once every 2 years, the IRM review should be held every year. During the year when the biennial POM is not being conducted, the IRM Plan

review should be conducted within the context of the "implementation" review of the second budget year and out-years scheduled to take place in October of the off-year of the 2-year cycle. The review should be completed in time to enable the Director of WHS and the IRM Planning Board to provide guidance that can be reflected in the bi-annual budget submission, or implementation review in the fall. This guidance, together with the analysis that led to it, should be incorporated into Sections 4 and 5 of the new IRM Plan.

The Director for IRM should provide the Director of WHS with staff support and should centrally coordinate component participation in the review process. The Director for IRM should act as the executive secretary of an IRM Planning Board, presided over by the Director of WHS. The IRM Planning Board should review the IRM Director's assessment of progress in meeting IRM goals and objectives and help the Director of WHS prepare guidance for subsequent PPBS activities.

5.3.5.4 Review by DCOAR.

The process explained in this section will occur if IRM-related functions remain assigned to the separate WHS directorates who are now responsible for performing the functions. An IRM Review Committee, with representatives of DCOAR, DIOR and DC&D, among others, should review the draft IRM plan prepared by DCOAR and the IRM Steering Committee, and make appropriate changes. DCOAR should coordinate the new draft with the OSD components.

Results of the coordination should be presented to the Director of WHS, with recommendations for remedial action by DCOAR. The Steering Committee should help DCOAR prepare this presentation, which should include reclaims by component managers against appropriate DCOAR recommendations, as specified in the IRM Steering Committee Charter.

The review and its subsequent coordination and preparation of DCOAR recommendations should be completed in time for the Director of WHS to provide remedial guidance that will be reflected in the annual budget submission or review in the fall. This guidance, together with the analysis that led to it, should be incorporated into Sections 4 and 5 of the new IRM Plan.

APPENDIX A

INFORMATION RESOURCE MANAGEMENT: AUTHORITY AND ORGANIZATIONS

1.1 PURPOSE.

The purpose of this appendix is to describe the policies, directives, and organizations that govern the management of information in OSD.

1.2 GOVERNING POLICIES AND DIRECTIVES.

Authority to plan OSD information resource management (IRM) is established in three documents:

- Office of Management and Budget (OMB) Circular No. A-130, *Management of Federal Information Resources*
- General Services Administration, *Federal Information Resources Management Regulation (FIRMR)*
- DoD Directive (DoDD) 7740.1, *DoD Information Resources Management Program*
- DoDD 7740.2, *Automated Information System (AIS) Strategic Planning*.

These documents conform with the Paperwork Reduction Act of 1980, which requires agencies to:

- Manage information efficiently, effectively, and economically
- Comply with the information policies, principles, standards, and guidelines prescribed by the Director of OMB.

The Act also requires every Federal agency to designate a senior official to carry out IRM responsibilities, including:

- Maintaining inventories of major information systems
- Periodically reviewing information management activities
- Making sure that information systems do not overlap

- Fulfilling responsibility for acquisition of information technology
- Ensuring compliance with the Federal Information Locator System.

The DoD IRM Program was established in June 1983 by publication of DoDD 7740.1. This Directive established DoD policy to implement IRM aggressively in ways that enhance mission performance through effective, economic acquisition and use of information.

Under the authority of DoDD 7740.1, the IRM Systems Directorate, Office of the Deputy Assistant Secretary of Defense (Comptroller/Management Systems) [DASD(C/MS)], promulgated five IRM goals for DoD in late 1984:

- Improve DoD mission operations and decision-making through effective and economic development and use of information.
- Integrate DoD information management activities through consistent plans, programs, policies, and procedures.
- Acquire and use information technology to improve mission effectiveness, productivity, and program management.
- Strengthen life-cycle management of information systems.
- Foster general awareness of the value of information and its associated costs.

1.3 DEFINITION OF IRM IN OSD.

OSD IRM is a combined management structure and set of activities that plan, program, budget for, and acquire information resources. These activities should promote a coherent strategy for improving use of information resources in the policy process, all within budgetary constraints. "Information resources" are defined broadly to include: (1) all information, whether automated or not, and (2) the media, personnel, and technologies used to manage, store, transport, and process the information. An informed defense policy has the following qualities:

- *Integration and Consistency of Information.* OSD defense policy products should be internally consistent and, to the extent possible, consistent with information in the policy products of other agencies (DoDD 5000.18 and 5000.20).
- *Security and Integrity.* OSD systems should ensure the integrity of information and invulnerability of information to unauthorized disclosure or

destruction to an extent commensurate with the importance of the information to the policy process and national security (DoDD 5200.28).

- *Responsiveness.* Information should reflect direction from outside DoD (Congress, the White House, and other Federal agencies) (DoDD 7740.1, OMB Circular No. A-130).
- *Accessibility.* Information should be available to those who need it, either on a day-to-day basis or in national emergencies (OMB Circular No. A-130).

These qualities should guide senior managers in setting information policy priorities.

1.4 IRM AUTHORITIES AND RESPONSIBILITIES.

1.4.1 OSD IRM Management Authorities.

The mission statement of the Director of Washington Headquarters Services (WHS) makes him responsible for managing information resources at the OSD level (DoDD 5110.4). With staff support from the Director, Computer and Office Automation Resources (DCOAR), the Director of WHS is responsible for establishing management practices in OSD to meet the IRM objectives mandated by DoDD 7740.1. Within the broad management guidelines set by the Director of WHS, OSD component managers are responsible for allocating information resources to support their functions. In short, the Director of WHS (with the assistance of DCOAR) provides program planning guidance to make sure that corporate OSD goals are pursued, and OSD component managers are responsible for managing the information projects that support their components' missions.

The delegation of authority from the Paperwork Reduction Act of 1980 to the OSD component level is depicted in Table A-1. The following subsections describe the IRM authority for both OSD and OSD components.

1.4.2 OSD-Level IRM Responsibilities.

Performance of OSD missions is the bottom line for all OSD activities, including the acquisition and use of information resources. OSD-level IRM requires a corporate perspective on OSD mission priorities in the broadest sense: a knowledge of current Defense priorities and of the degree to which current DoD policy supports those priorities. It also requires a detailed understanding of how information flows through the planning, programming, and budget system (PPBS).

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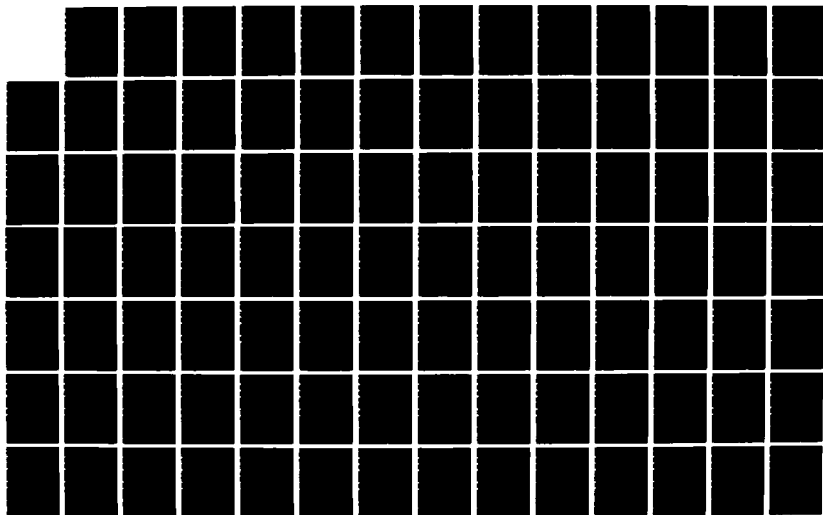
PLANNING FOR INFORMATION RESOURCE MANAGEMENT BY OSD(U)
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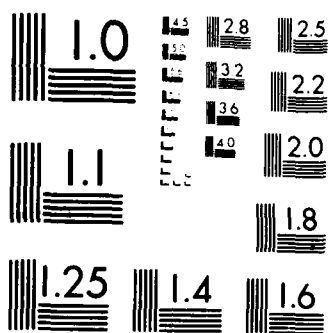
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process, so that effective guidelines for corporate data sharing and interoperability of AISs can be established.

TABLE A-1
DELEGATION OF IRM AUTHORITY

Organizational level	Overall IRM responsibility	Supporting staff	Authority
Federal Government	Director, OMB		Paperwork Reduction Act of 1980
DoD	Assistant Secretary of Defense (Comptroller)	DASD(IRM)	DoDD 7740.1
OSD	Director, WHS	DCOAR	DoDD 5110.4
OSD components	Component head	Manager, Computer and Office Automation Resources (MCOAR)	DoDD 7740.1, 5110.4, this plan

The Director of WHS, with technical assistance from DCOAR, is the focal point for establishing these priorities. DoDD 5110.4 makes the Director of WHS responsible for overall management of OSD information resources and, by inference, for IRM. The Director should receive functional input from OSD component heads and receive advice on technology from DCOAR, but he has final authority for IRM planning, programming, and budgeting priorities.

DCOAR provides the Director of WHS with specific technology support and general staff support in several areas mandated by OMB Circular No. A-130:

- Documentation of information system requirements that follow from OSD mission requirements
- Periodic review of requirements and the extent to which information systems are meeting those requirements
- Assessment of up-to-date AISs and their applicability to OSD information system requirements.

DCOAR also collates all OSD component mission requirements in the IRM PPBS process and produces programmatic packages for review by the Director of WHS to assist in his decision on resource priorities.

The Director of WHS recommends programmatic priorities and specific OSD component-level guidelines for spending on information systems. These guidelines do not specify limits for spending on particular component projects; every component can reprogram funds to meet reordered or new mission priorities.

All recommendations of the Director of WHS are subject to appeal by the component heads and adjustment by the DoD Comptroller, OMB, and Congress. In this regard, the Director of WHS, with the staff support of DCOAR, is responsible for defending OSD information resource planning, programming, and budgeting estimates.

1.4.3 Component-Level IRM Responsibilities.

Component heads, with the staff support of their Managers for Computer and Office Automation Resources (MCOARs) or designated subordinates, are responsible for acquiring information system support to ensure the success of component missions (DoDD 7740.1). The MCOARs make their component plans and requirements available to DCOAR and help develop the OSD-wide IRM plan.

Frequently, program managers (whether OSD component heads or designated subordinates) have no direct control over the technical and operational support for those systems, because they depend on agency computer centers or contracted service organizations. Nonetheless, program managers are responsible for allocating information resources to support their programs.

1.5 TECHNICAL CONSIDERATIONS.

According to IRM policy, two technical areas should be considered when AIS acquisition is planned: (1) security and (2) interoperability. The following subsections describe IRM policy in these respects.

1.5.1 Security.

The FIRMR (Part 201-7) and OMB Circular No. A-130 (Appendix III) require agencies to establish policies and procedures to make sure that, under all conditions,

sensitive data will be safeguarded from disclosure and from unauthorized modification or destruction. Adequate security must be provided for all automatic data processing (ADP) and telecommunications systems and services, including those provided by contractors.

Every installation with an ADP and telecommunications system is required to have a designated security person, with responsibility for developing, implementing, operating, and testing the ADP and telecommunications security program.

DoD has a special interest in security issues because of the potential damage to national security that could result from compromise of the information it manages. DoDD 5200.28, *Security Requirements for Automatic Data Processing (ADP) Systems*, establishes policy for DoD ADP security issues. It encourages careful review of ADP system security to make sure that (1) classified information is protected from unauthorized disclosure while (2) the costs of the security policy are carefully controlled. These are the authorities established for security policy:

- ASD(Comptroller) develops, coordinates, represents, and monitors ADP security policy.
- ASD (Command, Control, Communications, and Intelligence) is responsible for telecommunications security.
- The Department of the Navy provides ADP security training through the DoD Computer Institute.
- The Defense Logistics Agency approves contractor ADP systems for handling classified materials.
- The National Security Agency (NSA) provides DoD components with communications security assistance on request.
- The Defense Intelligence Agency approves ADP systems of DoD components and contractors (except those controlled by NSA) for processing, storing, using, or producing compartmented information.
- The Joint Staff monitors implementation of security policy and permits temporary exceptions from specific security measures.

1.5.2 Interoperability.

OMB Circular No. A-130 (§8.b.9) requires that information technology be acquired or developed "in a manner that facilitates necessary compatibilities." OSD manages many interrelated sets of automated information. DoDD 7740.1 (§E.3)

requires that this information be structured to encourage sharing of information and be appropriately consolidated for decision-making (§F.1.i). DCOAR has principal responsibility for making sure that interoperability among information systems is optimized throughout OSD and that functional managers consider the interoperability required to support the sharing of all data of corporate DoD interest.

1.6 ACQUISITION CONSIDERATIONS.

1.6.1 Identification of Requirements.

Every IRM project requires a functional description commensurate with the cost and complexity of the system. DoD Standard 7935, *Automatic Data Systems (ADS) Documentation*, provides guidance for assigning a complexity rating to IRM projects. The FIRMR requires that specifications be developed to a level of detail that promotes competition. Functional specifications are the preferred method of expressing user requirements in specification documents, but the type of each specification should depend on the nature of the mission need and the ability of the market to satisfy those needs.

1.6.2 Sole-Source Procurement.

Specifications should not limit the number of responsible sources that can satisfy a requirement. Agencies should select and impose only those specifications and standards that contribute to requirements essential to the defined mission performance of a system. Before exercising a renewal option on a system selection awarded on a sole-source basis, the agency concerned must conduct a new market survey, to determine the availability of alternative sources of supply.

1.6.3 Economic Analysis.

The FIRMR requires that an economic analysis be performed for every project with a life-cycle cost that exceeds \$50,000. Typically, several system configurations are capable of meeting system objectives. Economic analysis is designed to compare the costs and benefits of the alternatives systematically and to identify those which yield the greatest benefit for a given level of cost. Projects with life-cycle costs under \$50,000 require a comparative cost analysis, which "may be limited to an analysis that demonstrates that the benefits of acquiring the proposed system will outweigh

the costs" (FIRMR, Part 201-30.009-1). Appendix F, Attachment 1, contains an example of an economic analysis that meets FIRMR standards. (See Section 1.4.3.)

APPENDIX B

IRM PROGRAM MANAGEMENT

1.1 THE INFORMATION RESOURCE MANAGEMENT (IRM) PROCESS.

The IRM process, described here and first applied in the FY87 budget cycle, provides initial guidelines and procedures for implementing IRM planning, programming, and budgeting in OSD.

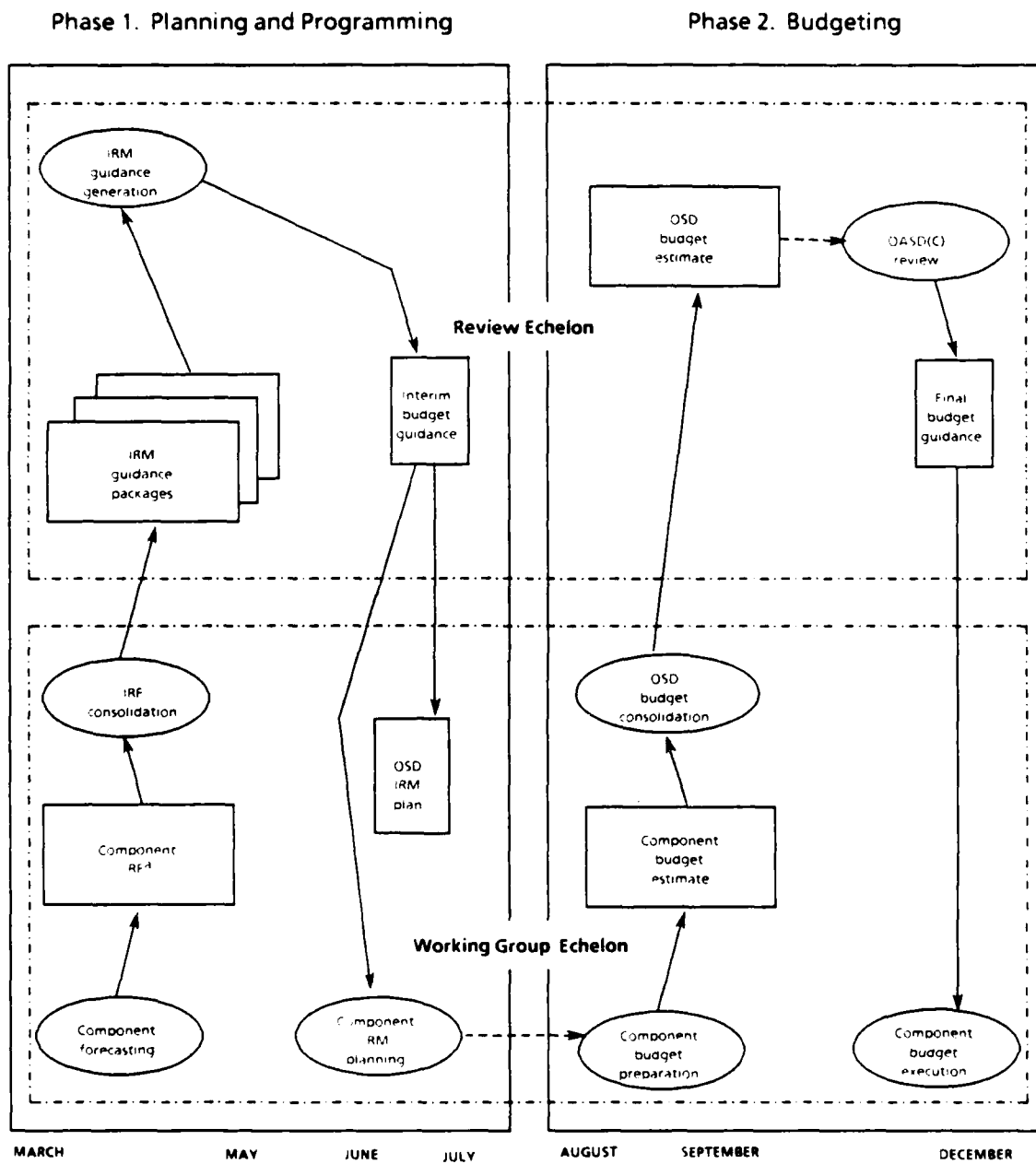
The IRM process consists of two phases of activity by two management echelons. Figure B-1 lists the activities of the IRM process and shows how these phases and management echelons are related. The first phase includes planning and programming processes that are designed to produce an IRM plan and establish priorities to guide budget activities. The second phase involves budget activities, including budget estimation and issuance of budget guidance emanating from development of the DoD budget and subsequent budget legislation.

1.2 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES.

The Assistant Secretary of Defense (Comptroller) [ASD(C)] is responsible for DoD IRM. The Director of Washington Headquarters Services (WHS) is responsible for managing information resources in OSD, WHS, and selected DoD field activities that support OSD directly.

The Director of WHS receives IRM staff assistance from the Director, Computer and Office Automation Resources (DCOAR), who presides over the IRM Working Group, consisting of all major OSD and WHS component Managers for Computer and Office Automation Resources (MCOARs). DCOAR is responsible for centralized coordination of planning, programming, and budgeting for information resources and for management of an overall IRM plan for OSD.

The management echelons depicted in Figure B-1 identify organizational responsibilities for policy guidance, planning coordination, and program and project implementation. The Director of WHS provides IRM program, policy, and budget



IRF - information resources forecast

FIG. B-1. OSD IRM PROCESS

guidance. The IRM Steering Committee at the IRM Working Group echelon provides staff-level coordination and project management.

1.3 IRM LINKAGE TO MISSIONS SUPPORTED.

A fundamental principle of IRM is the linking of information resources and activities to the OSD mission functions they support. The Chief of DCOAR and the IRM Steering Committee formulate IRM goals and objectives and determine how well information resources support the OSD mission. IRM goals generally cross component and mission-function boundaries and should, therefore, be approved at the executive manager level (i.e., IRM Review Echelon).

Component MCOARs are responsible for their project activities and priorities and for final allocation of their budgeted funds to support their component functions effectively. Projects support IRM goals, and a single project may support more than one goal. DCOAR is responsible for providing the component managers with general support, to ensure efficient sharing of resources and promote effective application of new technologies. DCOAR also makes recommendations concerning program content and priorities and reviews and consolidates component budget requests, after coordination with MCOARs.

1.4 RESOURCE PLANNING AND PROGRAMMING.

The planning and programming phase (Phase 1 of Figure B-1) begins with an information resources forecast (IRF) data call from WHS every March. This phase is scheduled to make sure that OSD's information needs are reflected in the DoD Five-Year Defense Plan (FYDP) process. OSD component IRFs indicate the manner in which resources are needed to support component missions over a 5-year period. Collation and review of these component IRFs generate overall information program and project priorities and guidance from the Director of WHS. The priorities and guidance become core elements of OSD and component IRM plans, and they facilitate preparation of budget estimates later in the year. A recent innovation is the formation of an IRM Steering Committee to assess overall OSD information processing needs and provide guidance for MCOARs to use in establishing their program and project priorities.

The basic planning and programming element is the project, which is a distinct activity with clearly defined resources, objectives, and managed at the component

level. Each projects' objectives are in support of one or more mission functions. There are currently over 150 component projects within OSD, further described in Appendix E. The Director for Computer and Office Automation Resources has grouped projects of similar nature into program categories to facilitate presentation of information resource plans and budgets to Comptroller analysts and Congress. The six current programs described in Appendix E may be changed to better articulate relationships between projects at an aggregate level.

Although planning and programming to date have been largely overshadowed by the iterative requirement for a budget submissions, the groundwork for future planning and programming has been laid. A particularly significant aspect of the early work in OSD IRM planning has been the close cooperation between DCOAR and the Joint Staff's Director of Information and Resource Management (DIRM) in developing IRM plans with a consistent format that will help improve IRM coordination and information exchange between OSD and the Joint Staff.

1.5 RESOURCE BUDGETING.

The budgeting phase (Phase 2 of Figure B-1) of the IRM process is initiated by the annual budget-estimate call from WHS every August. OSD component budget estimates are prepared in accordance with guidance from the Director of WHS and are reviewed and consolidated into an overall OSD budget estimate for submission by WHS to the OSD Comptroller. Component managers are provided with follow-up budget guidance by the Director of WHS as the DoD budget is finalized and as budget legislative activities proceed. This budget guidance shapes both project implementation and IRM planning for the next annual cycle.

In past years, information resources were not constrained. Budgets, allocated by the WHS Office of Budget and Finance for OSD components, were small and were allocated in the same manner as budgets for training, supplies, and office furnishings. Beginning in FY86, the Director of WHS, realizing that information resource budgets are becoming large and important for performing mission functions, charged DCOAR with budget allocation and oversight.

1.6 ANALYSIS AND VALIDATION OF IRM REQUIREMENTS.

MCOARs identify their components' requirements in their IRFs, and all requirements so identified are assumed to be valid. OSD has not yet established standards for requirements analysis. To support an OSD IRM plan, the components must submit enough information in their IRFs for their requirements to be assessed.

APPENDIX C

IRM AND OSD'S MISSION AND ORGANIZATION

1.1 MISSION.

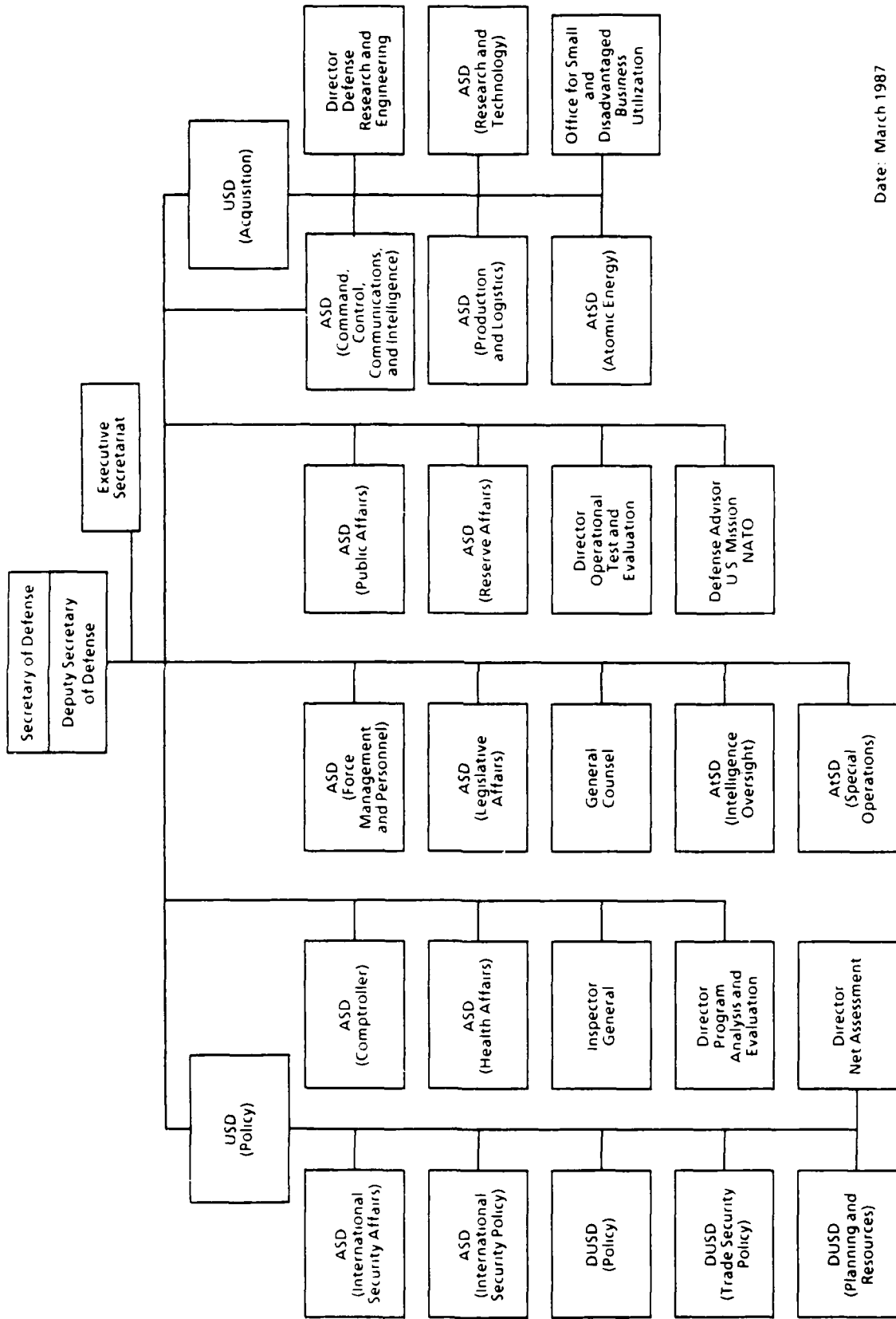
OSD serves primarily as the principal staff element of the Secretary of Defense in the exercise of responsibilities for policy development, planning, resource management, and fiscal and program evaluation.

The organizational structure of OSD is portrayed in Figure C-1. This organization is being set up only now, after the recent reorganization that resulted from the Goldwater-Nichols legislation of 1986, which created the new position of Under Secretary of Defense for Acquisition.

Information resource management (IRM) is based on linking information resource planning and acquisition to mission requirements. Broad statements of OSD functional missions are linked through a functional hierarchy with the following levels:

- *OSD missions* are broad statements of OSD's purposes.
- *OSD mission goals* must be met so that OSD will carry out its mission.
- *Component mission functions* are component-level tasks that must be performed so that goals will be achieved.

Every mission function of a component is supported by an information project or set of projects. An information project provides for management of a specific set of resources aimed at providing the information-processing applications needed to fulfill the mission function. Figure C-2 shows the linkage from one mission goal through one function to the resources in a specific project.



Note: USD - Under Secretary of Defense, [USD] - Deputy Under Secretary of Defense, AtSD - Assistant to the Secretary of Defense

FIG. C-1. ORGANIZATIONAL STRUCTURE OF OSD

Date: March 1987

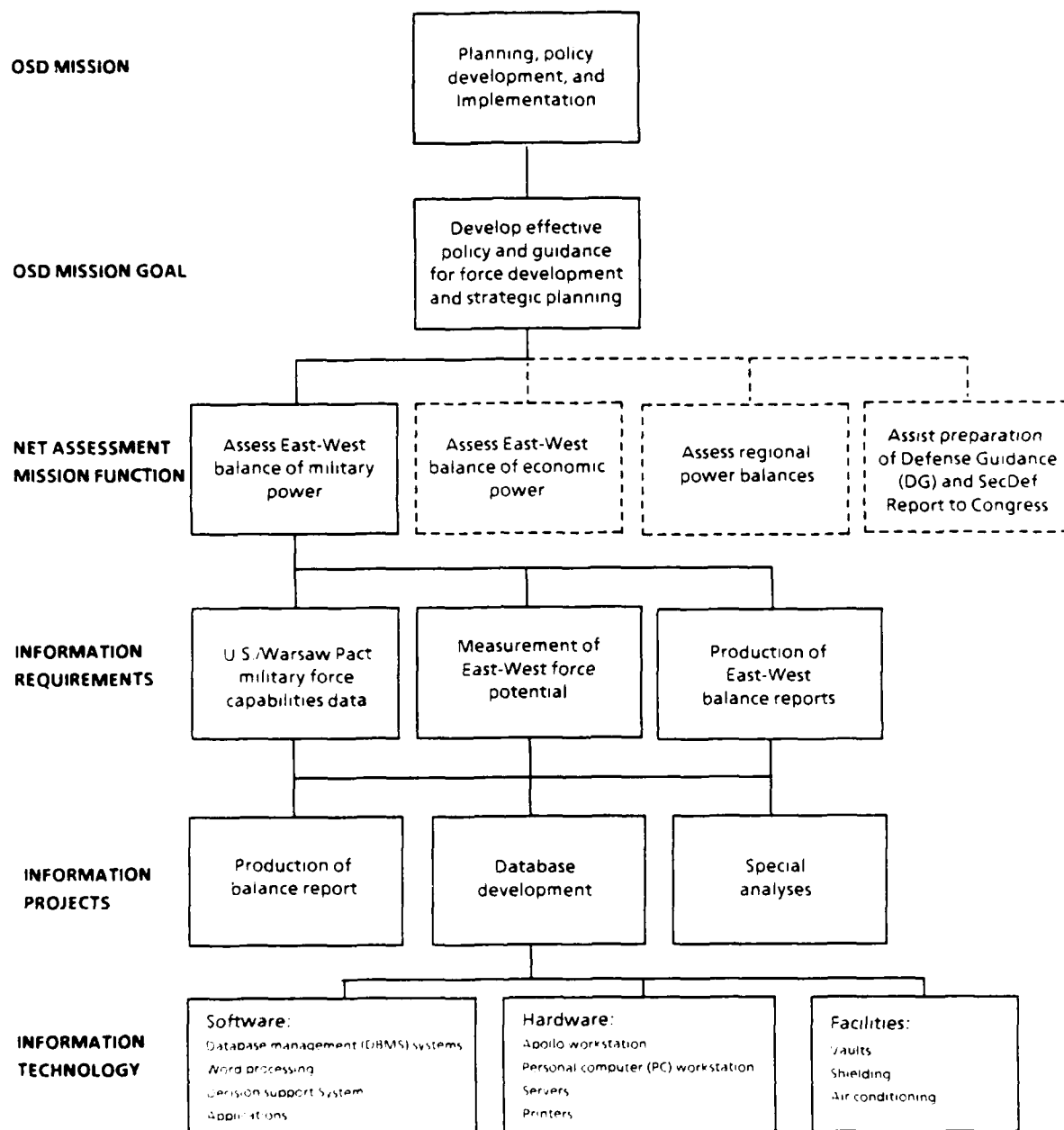


FIG. C-2. MISSION LINKED TO INFORMATION SYSTEM REQUIREMENTS AND SUPPORTING TECHNOLOGY

For OSD IRM purposes, OSD missions have been grouped and identified in the following mission categories:

- *Planning, Policy Development, and Implementation.* Conduct policy analyses and establish policies by issuing guidance on all DoD aspects of national security.
- *Programming, Budgeting, and Acquisition.* Plan and program for the effective use of resources to carry out DoD mission functions, recommend budgets to the President, and monitor the outlay of resources during acquisition.
- *Operational Direction of DoD Elements.* Implement operational command and control of military forces worldwide in a spectrum of contingencies ranging from exercises to global employment of U.S. and Allied military forces.
- *Policy Oversight and Program Review.* Conduct oversight programs through a series of internal control reviews to make sure that OSD policies and guidelines are being followed or are to be modified to meet changing circumstances.
- *Executive Branch Coordination and Representation.* Coordinate programs with other executive branch departments and agencies, to be sure that national security objectives are supported by other Federal programs and activities. Represent national security interests with effective public affairs programs.
- *Congressional Response and Liaison.* Comply with congressional legislation and direction in allocating funds to mission programs, furnish Congress with useful and consistent information about all DoD programs, and answer congressional inquiries for information.

1.2 MISSION GOALS AND COMPONENT FUNCTIONS.

Implicit in every major mission are mission goals, that is, operational tasks that, if accomplished, will assure a successful mission. The mission goals of senior managers enable IRM planners to focus, in the early stages of planning, on the information that is most important to mission accomplishment.

Table C-1 is a list of OSD mission goals, developed for purposes of this report.

SOME OSD MISSION GOALS

Mission	Mission goal
Planning, policy development, and implementation	Develop and promulgate policies that support national security objectives. Develop and promulgate policies covering DoD functions in national emergencies. Develop and promulgate effective policies regarding manpower, communications, health affairs, and release of information to the public. Develop and promulgate policies for DoD participation in drug interdiction and humanitarian efforts. Develop effective policy and guidance for force development and strategic planning.
Operational direction of DoD elements	Develop systems and standards for administration and management of approved plans and programs. Initiate programs, actions, and tasks to ensure adherence to DoD policies and national security objectives and to make sure that programs are designed to accommodate operational requirements. Inform organizations and personnel of new and significant trends or initiatives in assigned areas of functional responsibilities.
Programming, budgeting, and acquisition	Review proposed resource programs, formulate budget estimates, recommend resource allocations, and monitor execution of approved programs. Review and evaluate recommendations regarding requirements and priorities. Develop and improve the defense technology base. Develop and acquire the weapon systems needed to meet national security objectives. Assure placement of a fair share of DoD procurement with small businesses.

TABLE C-1

SOME OSD MISSION GOALS (Continued)

Mission	Mission goal
Policy oversight and program review	Provide oversight to assure effective allocation and efficient management of resources consistent with plans and programs approved by the Secretary of Defense. Develop evaluation mechanisms for effective supervision of policy implementation and program execution at all levels of the Department. Review and evaluate programs for carrying out approved policies and standards.
Executive branch coordination and representation	Serve as the focal point for Departmental participation in the security community and other Government activities. Develop DoD policy positions and recommendations and coordinate DoD participation in negotiations, foreign sales, and other international political-military activities.
Congressional response and liaison	Develop information and data and prepare reports and testimony for presentation to Congressional committees or in response to Congressional inquiries. Represent DoD before Congressional committees and individual members of Congress.

APPENDIX D

OSD INFORMATION TECHNOLOGY

1.1 PURPOSE.

The purpose of this appendix is to discuss the major elements of the OSD technology baseline in more detail than in Section 3 and to provide information about automated information system (AIS) projects and corporate databases in OSD.

1.2 OVERVIEW.

The most pervasive influence of technology on OSD over the past few years has been concern with increasing automated support to OSD professional staff members and managers to help them be more productive. Dedicated word processing systems have been augmented or replaced with new office automation (OA) systems. Modern OA systems integrate traditional word processing with idea processing, research, analysis, and drafting by professional staffs and managers. Component local-area networks (LANs) and OSD-wide networks will link desk-side workstations to the computing resources that staff members need to do their jobs and will support electronic exchange of information within and between OSD components. Although the cost of putting an OA workstation on every desk in OSD is very high, it will permit quantum improvements in staff and executive productivity. The results are beginning to be realized.

PACE Enterprises conducted in 1987 an evaluation of information resource management (IRM) within OSD components. They found that 81 percent of OSD component personnel use computer automation in their work and that managerial and supervisory personnel constitute 27 percent of users – nearly twice the proportion of managerial users found in a similar evaluation in 1985. Of OSD users, 78 percent agree that automation helps their productivity and functional capabilities, as well as the quality of their work. Managers cited increased productivity as the major benefit of automation. Of the professional staff members surveyed, 19 percent now use automation for more than 80 percent of their work, 76 percent for more than 40 percent.

1.2.1 Office Automation Within OSD Components.

OSD components have several types of workstations, acquired from multiple vendors. Many are word processors; most are standalone workstations, not linked to networks. The trend within components is toward using multifunction workstations from one or two vendors, developing an internal network, and trying to make TEMPEST and non-TEMPEST equipment interoperable. OSD components requiring frequent interaction are acquiring similar equipment. The major vendors now supporting OSD are Xerox, Sun, Datapoint, IBM, Converging Technology, and Wang.

Present programs for FY88 and FY89 are aimed at establishing OA systems in a stable environment by the end of FY89. Security considerations raise the cost of communication between OA systems, but the potential benefits to productivity of linked OA systems lend impetus to automation efforts. Two of the major projects are:

- As part of the secure LAN upgrade (see below), automation of the information management centers (IMCs) of Directorate, Defense Research and Engineering (DDR&E); Office of the Assistant Secretary of Defense (Command, Control, and Communications) [OASD(C3I)]; Directorate, Program Analysis and Evaluation (DPA&E); and the Office of the Undersecretary of Defense (Policy) [OUSD(P)]. Support will be provided for message and mail collection and distribution, suspense management and tracking, classified document control, and other functions.
- Office Automation Computer System (OACS), a new open-ended contract for acquisition of up to 4,740 generalized office automation workstations over a period of 8 years, provides UNIX-based workstations offering a wide range of OA features. The new contract, which is sponsored by the Office of the Assistant Secretary of Defense (Production and Logistics [OASD(P&L)]), is intended to support users of Sun and Lanier equipment.

Nearly all OSD components have projects in the program objective memorandum (POM) to acquire or expand their internal LANs. These are some of the significant projects:

- *Secure Local Area Network for Research and Engineering.* This secure office automation network provides communication, within and among components, remote communications, executive and managerial decision support systems, database management, imaging and graphics, computer-aided design, and word processing.

- *Office Automation (Public Affairs).* The present system of the Office of the Secretary of Defense (Public Affairs) [OASD(PA)] includes several types of word processors and minicomputers and has many databases supported by the USAF Seventh Communications Group (7CG). It will be replaced by a network of compatible workstations and internal computing resources capable of supporting all of OASD(PA)'s automation requirements.
- *OSD Secure LAN.* The Secure LAN, the Ethernet, already supports more than 600 users and is expanding rapidly. Because it can process classified data easily, it has already been adopted as the internal LAN by OSD components that have major roles in the planning, programming, and budgeting system (PPBS), and need to process significant amounts of classified information. The present system has evolved around multiple Ethernet LANs running XNS¹ protocols. The major users in addition to Office of the Assistant Secretary of Defense (Comptroller) [OASD(C)], which is the network sponsor, are OASD(C3I), DDR&E, OUSD(P), and DPA&E. These components now operate separate LANs in their offices at the Pentagon. A system upgrade that is now planned will integrate these networks into a single secure network, using end-to-end encryption to support intercommunications among all OSD users. In addition, the secure network will furnish automation support to various C3I activities. It will have a standard user interface for OA/LAN functions, user development of customized applications that integrate with the standard OA functions, and a decision support system for executives. Because OSD has a substantial capital investment in Xerox equipment, the new system will be interoperable with the current. To provide support for the IMCs, the new system will be linked to the Joint Chiefs of Staff (JCS) Information Services Center.
- *OSD Administrative LAN.* There are now more than 400 users of the Arcnet, using more than 175 processors, more than 160 workstations, 192 printers, 10 remote processors and related workstations, and miscellaneous dial-up equipment within the National Capital Region (NCR), supported on 40 dial-in lines. In total, 1.7 billion characters of mass storage are supported in the administrative environment. The Arcnet is managed by the Directorate of Computer and Office Automation Resources (DCOAR).

The system offers several automated tools to subscribers. These include: word processing, document and file management, electronic spreadsheet, electronic mail management, graphics production, database management, video conferencing, and automated calendaring. In addition, Arcnet provides the OSD staff with access to mainframe data processing on MULTICS and the IBM 3032 that belongs to the 7CG. Database

¹XNS is the protocol that supports full interoperability of OA products produced by Xerox.

management and information sharing are supported by the IDM 500 Intelligent Data Base Machine.

Major users are Washington Headquarters Services (WHS), the DoD Inspector General (IG), and OASD(PA). Other OSD components use the Arcnet primarily to access the OSD Correspondence Control System. The Arcnet was the first distributed processing system available to OSD, and many single-user databases are implemented on the LAN. Plans are under way to identify the replacement LAN, but the system concept for the replacement has not yet been developed.

- *Office Automation Computer System.* The open-ended OA contract mentioned earlier in this appendix includes specifications for telecommunications hardware and software for an integrated network. The volume of equipment that may be procured under this contract is large enough to include replacement of the Arcnet (see above).
- *Security Systems (Metaphor)* provides a secure network with 50 to 75 workstations that will support the Pentagon police force OA and database application needs.

1.2.2 Wide-Area Communications.

OSD components communicate with organizations and databases outside the Pentagon in a variety of ways. Message processing and secure voice transmission capability are provided through the Information Services Center. A new Automated Message Distribution System will permit review of incoming messages on video screens so that OSD will be able to print desired messages only. Some components subscribe to the Defense Data Network (DDN). Others communicate from terminals linked to their LANs or from terminals installed specifically to communicate with external databases. To enable OSD users to access data and computing capabilities from their work areas, OSD components are installing and enlarging networks and are considering software conversion and gateways to allow access via networks and dissimilar communication protocols. Gateways are being addressed by several components. These are some of the gateway projects:

- The Defense Applied Information Technology Center (DAITC) has gateway systems and terminal emulation projects to provide transparent access to DoD laboratories and databases needed by the research and development community, user-friendly access to DoD databases and contractor databases by the OSD staff, and the ability to access different systems and networks from major types of terminals.

- OASD(P&L) is evaluating the feasibility of various technical bridges, such as intelligent gateways, to interface heterogeneous equipment and software and has a project to fund a gateway system.
- OASD(C) has gateways between networks to connect its personnel with printing, computing, and storage facilities. Its gateways connect it to other organizations for collecting and distributing PPBS information.
- DPA&E enables analysts to access mainframe computer resources from their offices and provides a capability for information exchange with related OSD organizations.
- Office of the Assistant Secretary of Defense (Reserve Affairs) [OASD(RA)'s] Network Connectivity project will connect their network with OASD(C)'s Ethernet and DCOAR's Arcnet.

1.2.3 Support of OSD by USAF 7CG.

The 7CG is the principal data processing facility supporting OSD. Its MULTICS system holds more than 20 large, classified OSD databases, including the Five Year Defense Plan (FYDP), and runs numerous analytical models for OSD components. Its classified IBM system provides full-text search and retrieval of speeches by Secretaries of Defense and supports many other OSD applications. Other 7CG computers support unclassified database applications for OSD.

Because the 7CG supports the major OSD corporate databases, its resources are of major concern to OSD components. Although 7CG is replacing MULTICS, the organization will still not have the personnel or computing capability to support all of OSD's needs. DCOAR and the OSD component Managers for Computer and Office Automation Resources (MCOARs) must decide where to support OSD's present processing requirements and develop criteria for deciding where to support future requirements for large-scale computing. Several OSD projects indicate activity on the part of DCOAR and the MCOARs to augment the capability for large-scale computing or storage formerly provided to OSD almost exclusively by 7CG. Some of the projects are these:

- DCOAR is acquiring an Elexsi super-minicomputer to support OSD's needs for gateway and database development.
- OASD(PA) Office Automation will provide for a combination of mini-computer and optical disk storage to satisfy requirements formerly met by 7CG.

- Many components are requesting minicomputers to provide data storage on their internal LANs in addition to furnishing other network services.

1.2.4 Defense Applied Information Technology Center.

The DAITC is a new facility, established by DCOAR to research, acquire, and test new technology pertinent to OSD needs and to develop systems to meet OSD's needs. DAITC is establishing several laboratories:

- An interoperability laboratory to test gateways and other means of network interconnectivity
- An artificial intelligence (AI) laboratory to test decision support systems
- An optical data entry and storage laboratory, which is testing personal computer (PC)-based media
- A supercomputing laboratory to test mass storage and retrieval devices.

1.2.5 Executive Decision Support Centers.

Several OSD components are building or planning executive decision support centers to support component missions. USD(P)'s Crisis Coordination Center, Directorate, Defense Research and Engineering (DDR&E's) Decision Support Center, and OASD(RA)'s Executive Decision Support Center are designed to give senior managers direct access to critical data.

- *USD(P) Crisis Coordination Center* is a sensitive, compartmented information facility (SCIF) for use by the Crisis Coordination Group that is formed by the Secretary of Defense during emergencies. This center is the focal point for crisis-related actions that require coordination, approval, or consideration by any office in OSD. The facility includes automatic data processing (ADP), computer graphics, telecommunications, and audio-visual support.
- *DDR&E Decision Support Center* is a SCIF used by the Under Secretary of Defense for Acquisition for deliberations and classified briefings regarding DoD's resource allocation plans. The facility includes ADP, computer graphics, telecommunications, and audio-visual support.
- *OASD(RA) Executive Decision Support Center* will serve as a mobilization coordination center during emergencies and exercises, and a repository for mobilization data. It will also serve as a drilling site for Reserve members who are assigned to the crisis center during active duty.

1.3 MAJOR DATABASES SPONSORED BY OSD.

A number of OSD components require large-scale computational support to carry out their missions to plan for complex programs and to model strategic scenarios. New developments in database machines and database management systems (DBMSs) have improved access by different OSD systems to common databases and software applications. A Britton-Lee database machine supports the Foreign Disclosure and Technical Information System (FORDTIS), and one has been added to the OSD unclassified administrative Datapoint network. In some instances, a database can be accessed by the sponsoring office only. Others contain information useful to both the sponsoring component and other components. Large databases used by OSD can be grouped as follows:

- Political-military
- Strategic and operational intelligence
- Military operations
- Logistic resource management
- Program budget
- Manpower and personnel
- General, administrative, and system support.

Although the databases described in the following sections do not constitute a complete inventory of the OSD data needed to support decision-making, they do represent the data for which automated processing support has been provided. Database descriptions were developed from information on Defense Department (DD) Form 43Cs, which OSD components submitted in response to the FY87 budget call.

1.3.1 Political-Military Data.

Some of OSD's major databases include data used in making political decisions. Many OSD users require access to this type of information. One example of an attempt to create a database in support of multiple users is the proposal to integrate data required by the Defense Technology Security Administration (DTSA) into the FORDTIS database. DTSA was established in 1985 to undertake projects of concern to DoD in technology security. These concerns include international transfers of

defense-related technology, policies governing transfers, and intelligence and enforcement activities to restrain the flow of such transfers to potential adversaries. FORDTIS already contains case records describing transfers of information, technology, and munitions to foreign governments. Integration of the information-processing needs of DTSA with the existing capabilities of FORDTIS is being considered. Some political-military databases, in addition to FORDTIS, are:

- International Treaties will cover all U.S. treaties and agreements in force in which DoD has an interest.
- NATO Burden Sharing Database contains information from which the Burden Sharing Report for Congress is generated.

1.3.2 Strategic and Operational Intelligence Data.

Development of the Intelligence Assessment Information System (IAIS) is an example of an activity for intelligence data to which multiple users need access. In support of an intelligence data-sharing effort between OSD, Defense Intelligence Agency (DIA), Central Intelligence Agency (CIA), and the Military Departments, the Office of Net Assessment (ONA) has begun to develop an automated IAIS. The IAIS will integrate a variety of databases from the intelligence community and supporting contractors to promote standardized data elements within the intelligence community. The IAIS will support integration of the modeling capabilities of the CIA, the National Security Agency (NSA), and the RAND Corporation in a common UNIX environment. The IAIS will provide the Secretary of Defense with a broader range of intelligence data and assessment techniques to make analysis of strategic options more responsive to his needs.

A combination of automation initiatives within the OASD(C3I) is improving the management of DoD intelligence resources worldwide. Intelligence Resource Information System (IRIS) provides in-depth intelligence and special warfare resource data and analysis. IRIS began development in FY86 and will have full operational capability in early FY88. Secure clustering of office workstations is proceeding through FY88 and will be followed in FY89-90 by linkage of office clusters in an integrated LAN.

1.3.3 Military Operations Data.

These are some databases that support military operations:

- The Defense Emergency Authorities Retrieval and Analysis System (DEARAS) is a portable system, used to support the legal aspects of DoD missions associated with mobilization, crisis management, and continuity of operations.
- The Defense Force Planning/Global Force Trends Database will serve as a source of consistent data on current and future conventional forces for the United States, other NATO, Warsaw Pact, China, and several other countries.

1.3.4 Logistic Resource Management Data.

Many large databases support logistics management:

- Automated Acquisition Regulations will be a database of Federal Acquisition Regulations and Defense Acquisition Regulations. The entire DoD contracting community is to have access to it eventually.
- The Defense Energy Information System (DEIS) is used in the monitoring of worldwide supplies and consumption of energy. Data collected from more than 2,200 activities is used for supply management, energy conservation management, energy policy analysis, readiness assessment, and research and development.
- The Defense Industrial Network will collect, analyze, and evaluate information from many sources, to assess the capabilities of various U.S. industrial sectors, monitor foreign sources, and detect constraints on production.
- The Defense Maintenance Information System covers the reliability and maintainability of common components used in DoD, and cost and production data associated with organic and contract field- and depot-level maintenance.
- The Installation Database will contain base operating support costs for approximately 250 major military installations. The database is used to produce the Base Structure Report.
- The Integrated Logistics Support (ILS) includes reliability and maintenance data, ILS data, cost data, and schedule and equipment characteristics.

- The International Logistics Database, now being developed, will contain information of U.S.-origin equipment in foreign inventories, including follow-on support.
- The Logistics System Modernization Management Information System tracks milestones and accomplishments for the logistics automated system development program of each major DoD component. It provides a central repository of system descriptions, benefits, and cost data.
- The Management Information System for Spare Parts will provide automated storage and retrieval of 25 linear feet of spare parts files.
- The Manufacturing Technology Program Information System will combine manufacturing technology data maintained by all Military Services.
- The Petroleum Disruption Response System will integrate a variety of petroleum product supply options, energy supply data, and statutory authorities predating 1973. It will support decision-making during an energy crisis.
- The Petroleum Quality Data System will network databases covering quality assurance and surveillance of petroleum products throughout DoD into a comprehensive, reliable system, for use in analyzing trends in the quality of the petroleum products that DoD acquires, stores, distributes, and consumes.

1.3.5 Program Budget Data.

Several major corporate databases support the DoD PPBS directly, and contain data of interest to most OSD components:

- The Budget Review System (BRS), the major module of the system, maintains data for the Presidential budget and the Manpower Subsystem for OSD, the Services, the Defense agencies, and the Office of Management and Budget (OMB). At the end of the budget review, data are transferred to OMB and DoD reports are issued. During the review, the data are extremely time-sensitive and are scrutinized by all the organizations listed above. BRS is run on the MULTICS system.
- The Research and Development and Procurement annexes are more detailed looks at specific aspects of the DoD budget. Each annex is updated three times a year in conjunction with the FYDP. After the budget review, versions of the annex data are also sent to Congress and become a starting point for congressional action.
- The Congressional Action Tracking System (CATS) is used to keep track of the progress of the budget through Congress. Congress usually receives the budget in January and works on it until at least 1 October (the start of the

fiscal year). The actions of committees in both houses during this time are recorded and kept current.

- The FYDP, an international management system, is the cornerstone of the PPBS. The FYDP traces both past and planned use of funds.
- The Expenditure Forecasting System (EXP) is a collection of forecasting tools. Most other modules use Total Obligational Authority (TOA) data and, when necessary, obtain obligations and outlays through EXP. The tools are built to interface with the other systems and forecast outlays and obligations.
- The Budget Execution (BEX) modules are the main records of current financial data. TOA actually obligates and outlays during the current fiscal year, based on data collected from the Services and agencies. Then potential problems can be traced before they become a problem, while accurate historic data also become available for expenditure models.
- The Production and Logistics (P&L) Defense Resources Model yields estimates of the effects of force changes on DoD resources, aligning the FYDP resources according to traditional categories of force readiness, sustainability, and modernization.
- The Program Element/Defense Planning and Programming Category makes available data for the Defense Manpower Requirements Report and budget analysis before they are available from the printed FYDP.
- The Contractor Cost Data Reporting Database will provide cost data for weapon system analysis.

1.3.6 Manpower and Personnel Data.

A major group of OSD databases consists of those with personnel information:

- The All-Volunteer Force database contains historical force composition data (e.g., officer, enlisted, male, female, grade skill) provided by the Services and Defense Manpower Data Center.
- The file of Civilian Assets for Mobilization Planning contains the names and addresses of all DoD civilian and military retirees – approximately 1.2 million.
- The Defense Industrial Security database comprises data on the 36,000 industrial requests for security clearances processed by DoD every year.
- The Defense Medical Systems Support Center gives access to military medical statistics.

- The Defense Personnel Analysis System provides ready access to general historical files, the POM-enlisted force trends, and projection models. Subsystems will be added for Enlisted Bonus Management, Enlisted Force Projection, and Officer Force Projection. It is supported by the Naval Personnel Research and Development Center.
- The Nonappropriate Fund (NAF) Personnel Management Information System maintains data about DoD's 220,000 nonappropriated-fund work force.
- The Productivity-Enhancing Capital Investment Tracking System consists of records of the approximately 200 project proposals submitted each year for productivity-enhancement funds, with complete life-cycle data on the 60 to 70 projects that are submitted for funding.
- The Recruit Market Network Files contain attitudinal, geographic, and demographic data about potential military recruits.
- The Recruiting Resources Tracking System contains historical information on such recruiting resources as advertising budgets, operations and maintenance (O&M) recruiter support, manyears, and end-strength of recruiting headquarters and field personnel.
- The Wartime Manpower Planning System contains Service-developed time-phase requirements for both military and civilian wartime manpower. It compares Service-calculated requirements with Service-calculated supplies.
- Manpower and personnel statistics maintained by Directorate for Information Operations and Reports (DIOR) and listed in Section 1.3.7.2.

1.3.7 General, Administrative, and System Support Data.

General, administrative, and system support databases include three kinds of data: (1) data about management of local resources, (2) statistical databases, and (3) commercial databases used by OSD components. Some databases in this section are identified by title, but not described, because the DD Form 43C's submitted by the database sponsors did not include descriptions of the data.

1.3.7.1 WHS Local Resource Management Databases.

Many databases contain information about local OSD resources. Generally, they are sponsored by WHS, and most are supported by the OSD administrative network:

- Building Control.

- Classified Document Management.
- Correspondence Tracking comprises data on correspondence to and from the Secretary of Defense and assigned to OSD components for action. It also includes an index to microform copies of the correspondence.
- Criminal Investigation Case Tracking monitors current criminal investigations by the Defense Investigative Service, and stores data and previous investigations.
- The Defense Privacy Act Component Record Systems contains component record system notices that are published annually in the Federal Register.
- DoD Hotline Support Tracks responses to callers who report fraud, waste, or abuse through the DoD hotline.
- Financial Management System contains base, intermediate-level, and department-level accounting, as well as reporting, trust-fund investment, and budget formulation information.
- The Internal Management Control database tracks the status of DoD initiatives for management improvement.
- The Job Vacancy Information System maintains lists of job openings serviced by the Pentagon.
- The Joint Adjudication and Clearance System comprises security clearances granted by DoD to contractor personnel.
- Management of DoD Buildings in the NCR.
- Original Classification Authority.
- Parking Control.
- Subscription Tracking.
- Safety and Health Hazard Inspection Management.
- Veteran Affairs Case Tracking.
- WHS Personnel Management.
- Work Order Suspense Tracking.

1.3.7.2 DIOR Statistical Databases.

One mission of DIOR is to act as a central data service to accumulate data and to provide reports and related analyses and evaluations. DIOR administers information and data systems in support of the OSD decision- and policy-making

process and draws on their databases for statistics and reports to OSD and other agencies. For example, the DIOR Acquisition Management Data System contains the following data:

- Blue-Top Validation.
- Contracting Office Identification.
- DD Form 350 Prime Contract Awards over \$25,000.
- DD Form 1057 Prime Contract Awards under \$25,000.
- Dun and Bradstreet Contractor Identification.
- Federal Information Processing Standard (FIPS) 55.
- Federal Supply Classification/Service Inventory.
- Weapon System/Equipment Coding.

The following manpower databases sponsored by DIOR, are scheduled for integration by 1988. This project will make possible the receipt of all source data in machine-readable form and will allow electronic transfer of databases or portions of databases to clients for manipulation and analysis and to Defense Printing for publication. The databases are:

- Distribution of Personnel by Operating Location System.
- Federal Civilian Employment Reporting.
- General/Flag Officer Billet Information.
- Health Manpower Information System.
- Indirect Hires Reporting System.
- Korean Conflict Casualty System.
- Military Manpower Press Release System.
- Military Manpower Reporting System.
- Personnel and Payroll Outlays System.
- Report of Employment by State System.
- Selected Medical Care Statistics System.
- Vietnam Conflict Casualty System.

- Worldwide Active Duty Casualty System.
- Worldwide Manpower Distribution of Country Reporting System.

Other DIOR databases are:

- Census of Manufacturing System.
- Consolidated Federal Funds Report System.
- Motor Vehicle Report System.
- NATO Mutual Support System.
- Presidential Protection Assistant Act. This database provides a detailed account of DoD expenditures in support of the President and Vice President of the United States, specified high U.S. Government officials, and foreign heads of state and other dignitaries visiting this country.
- Real and Personal Property System.
- Summary Subcontract Report System.
- Supply Systems Inventory System.
- Working Capital Funds System.

1.3.7.3 Commercial Databases.

Several OSD components subscribe to commercial databases, including:

- Contractor Identification Number Services (DUNS), which contains data on contract replacement statistics prepared by Dun and Bradstreet.
- DRI, Wharton, and Chase econometrics databases.
- Financial Data Information System (FINANDIS), which is a database of contractor financial statements and a series of programs to retrieve, analyze, and project the financial condition of major defense contractors under varying conditions.
- Standard and Poor's Financial Statement Database.

APPENDIX E

OSD INFORMATION PROGRAMS, PROJECTS, AND SPONSORS

1.1 PURPOSE.

The purposes of this appendix are to:

- Describe all OSD information resource management (IRM) projects and list the sponsors.
- Identify the information programs into which OSD IRM projects are grouped in the Program Objective Memorandum (POM).
- Specify the FY87 and FY88 funds earmarked for each project and for each program.

1.2 OSD INFORMATION PROGRAMS AND PROJECTS.

OSD information programs specify generic information activities that cut across OSD and component mission functions. These activities provide categories for grouping component projects and for assisting OSD decision makers in setting priorities and allocating resources. Although IRM budgets are allocated among information programs, each program is an aggregation of information technology projects required by individual OSD components. IRM budget reporting to the OSD Comptroller is stated in terms of the information programs.

Sections 1.2.1 through 1.2.6 summarize the IRM programs. Program funding profiles show which funds are earmarked for obligation in the current fiscal year, with projected funding through FY92. Representative activities supported within each program indicate the scope of the program. Section 1.3 compares resource budgets of OSD components. Section 1.4 lists the funds associated with every project in each program. Section 1.5 describes all projects.

1.2.1 OSD Component Mission Support.

Program 01, OSD Component Mission Support, provides information processing for applications that support component missions. This program supports

planning and execution of component policies, as well as acquisition and maintenance of component-unique databases.

Mission Supported: This information program supports the OSD mission functions of policy development, planning, resource management, and fiscal and program evaluation. With the exception of support for program budget activities, which lie within Program 2, this program concentrates on support of component mission functions rather than development of general administrative or operational support.

Representative Activities Supported: PA&E/CINC support establishes secure data links from the Directorate of Program Analysis and Evaluation (DPA&E) to the Commanders-in-Chief or the Unified and Specified Commands (CINCs) for coordination of Program Element force levels. The Foreign Disclosure and Technical Information System (FORDTIS) provides automated coordination between OSD and other agencies regarding policies and decisions covering release of technical information and products to other nations.

Balance Production assesses the balance of forces between NATO and the Warsaw Pact and between potential opposing forces in several regions of the world.

The Intelligence Resource Information System tracks all DoD intelligence community resources worldwide.

The Defense Energy Information System tracks information on all energy resources needed by the Defense Department and prepares forecasts to support future allocation decisions.

Integrated Logistics Support establishes a logistics database with a database management system (DBMS) and supports analytical work for relating reliability with maintainability data.

Funding Profile:

Projected obligations (thousands of dollars)					
1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
17,111	20,415	24,932	3,455	3,628	3,806

^a Procurement funds only

1.2.2 Program Budget and Analysis.

Program 02, Program Budget and Analysis, supports development, presentation, and maintenance of the DoD Five Year Defense Plan (FYDP) with

database management, decision support, presentation graphics, and word processing. Material prepared includes reports, analyses, and presentations of DoD program budget issues to Congress, the White House, and the public.

Missions Supported: This program directly supports the mission of developing, analyzing, and communicating DoD program budgets. The FYDP is a major information product of OSD that helps in policy direction and resource management throughout DoD.

Representative Activities Supported: Programming and budgeting for OASD(C) supports budget execution, planning, and system management by the DoD Comptroller. MULTICS Software Conversion converts PA&E programs from Honeywell MULTICS system to MULTICS replacement.

The Program Budget System funds research and engineering budgeting, data management programs, and time-sharing services that support production of the Congressional Justification Book, Export Control Database, and other products of analysis.

Funding Profile:

Projected obligations (thousands of dollars)					
1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
12,827	20,378	18,374	2,037	2,147	2,261

^a Procurement funds only.

1.2.3 Secure OSD Office Systems.

Program 03, Secure OSD Office Systems, provides secure word processing, presentation graphics, desktop publishing, local area networking, and document storage and retrieval. It enables the OSD staff to create, coordinate, and distribute classified documents and files that help formulate and communicate DoD policies, plans, and programs.

Missions Supported: This program supports all the OSD mission functions of policy development, planning, resource management, and fiscal and program evaluation. It focuses on effective use of the information resources that perform the office automation aspects of these mission functions in a secure mode.

Representative Activities Supported: Policy Secure Office Automation local-area network (LAN) provides automated support for preparation of policy

papers for the Secretary of Defense and Office of the Under Secretary of Defense (Policy) [OUSD(P)].

Secure Directorate of Defense Research and Engineering (DDR&E) LAN provides similar capabilities for the Under Secretary of Defense (Acquisition).

Management Information Centers develop up-to-date automation equipment for the Executive Office of the Secretary of Defense, including portable micro-computers to link the Secretary with the Pentagon when he is away from Washington.

Networking for the OASD(C) supports the DoD Comptroller planning, programming, and budgeting system (PPBS) by connecting the Comptroller's staff with clerical and decision support capabilities.

Funding Profile:

Projected obligations (thousands of dollars)					
1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
10,286	26,352	28,212	8,107	8,540	8,989

^a Procurement funds only.

1.2.4 Nonsecure OSD Office Systems.

Program 04, Nonsecure OSD Office Systems, provides nonsecure word processing, presentation graphics, desktop publishing, local-area networking, and document storage and retrieval. It enables the OSD staff to create, coordinate, and distribute unclassified documents and files that help formulate and communicate DoD policies, plans, and programs.

Mission Supported: This program supports all the OSD mission functions of policy development, planning, resource management, and fiscal and program evaluation. It focuses on effective use of the information resources needed for the office automation aspects of mission functions that do not need secure processing.

Representative Activities Supported: Datapoint Replacement provides for replacement of obsolete Datapoint equipment being used to support OSD administrative functions and word processing.

Combined Director for Information Operations and Reports (DIOR) Requirements supports management of DoD forms, Information Locator

System, DoD Acquisition Management Data System, Summary Subcontract Report System, and other OSD reporting systems.

Public Affairs Office Automation supports information processing in the Office of the Assistant Secretary of Defense (Public Affairs) [OASD(PA)].

Funding Profile:

Projected obligations (thousands of dollars)					
1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
8,282	11,069	13,477	2,135	2,250	2,369

^a Procurement funds only.

1.2.5 OSD Operational / Management Support

Program 05, OSD Operational/Management Support, provides support for information processing that is common to all OSD components or that is centrally provided to a number of OSD users. The program provides funds for operations and maintenance (O&M) of systems that support multiple components. It also supports personnel, security, supply, and facilities management projects.

Mission Supported: This program supports all the OSD mission functions of policy development, planning, resource management, and fiscal and program evaluation. It focuses on support of the mission functions needed to operate and maintain common information processes.

Representative Activities Supported: Defense Supply Service – Washington (DSS-W) upgrades the automation of contracting/acquisition for DoD, needed to offset manpower shortages in DSS-W.

Database Machines enable the OSD staff to send *ad hoc* data queries of distributed databases, generate reports from databases, and provide interoperability among a variety of hardware and software systems.

Administrative Support operates a wide spectrum of administrative functions, such as budget, accounting, procurement management, inventory control, personnel, travel, and space management for day-to-day operation of OSD.

Funding Profile:

Projected obligations (thousands of dollars)					
1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
6,294	12,927	12,625	2,459	2,591	2,729

^a Procurement funds only.

1.2.6 Applications of Technology

Program 06, Technology Applications, develops new and emerging information technologies for application to the needs of OSD and the Joint Staff. This program identifies, tests, and builds prototype applications designed to enhance the productivity and effectiveness of OSD mission functions.

Mission Supported: This program supports all the OSD mission functions of policy development, planning, resource management, and fiscal and program evaluation. It focuses on the application of new information technologies, to improve the effectiveness with which those mission functions are carried out.

Representative Activities Supported: Interactive Video provides OSD with a training tool that enables staff members to create, maintain, and update their own libraries of staff training modules.

Information Retrieval System provides OSD with a full-text, document storage and retrieval capability.

Large-Scale Computational Support provides development of an alternative to the Honeywell MULTICS system for possible interim or full-scale deployment by FY89.

Decision Support Artificial Intelligence prototypes new software and hardware needed to improve OSD decision support capabilities.

Funding Profile:

Projected obligations (thousands of dollars)					
1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
3,313	4,327	4,842	1,159	1,220	1,286

^a Procurement funds only

1.3 INFORMATION TECHNOLOGY BUDGETS.

1.3.1 Total Information Technology Resource Requirements.

Table E-1 shows the distribution of resources across OSD Information Programs for FY87 – 92.

TABLE E-1
TOTAL RESOURCES REQUIRED FOR OSD INFORMATION PROGRAMS
(Thousands of dollars)

Program	1987	1988	1989	1990 ^a	1991 ^a	1992 ^a
01 OSD Component Mission Support	17,111	20,415	24,932	3,455	3,628	3,806
02 Program Budget and Analysis	12,827	20,378	18,374	2,037	2,147	2,261
03 Secure OSD Office Systems	10,286	26,352	28,212	8,107	8,540	8,989
04 Nonsecure OSD Office Systems	8,282	11,069	13,477	2,135	2,250	2,369
05 OSD Operational/Management Support	6,294	12,927	12,625	2,459	2,591	2,729
06 Technology Applications	3,313	4,327	4,842	1,159	1,220	1,286
Total	58,113	95,468	102,462	19,352	20,376	21,440

^a Procurement funds only.

1.3.2 Comparison of Information Technology Resource Budgets of OSD Components.

This section compares the information technology resource budgets of the OSD components for FY88 and FY89. Tables E-2 and E-3 compare dollar amounts, Tables E-4 and E-5 the percentages of OSD information technology resources.

WHS accounts for the largest share of the total component budget, mainly for administrative support, including budgeting, accounting, civilian and military personnel management, office services, security, correspondence, directives and records management, information and data systems, and computer services. A combination of word processing, document and file management, electronic mail, spreadsheets, graphics, video conferencing, and automated calendaring supports OSD. LANs provide gateways for collecting and distributing PPBS information to support budget planning and execution.

1.4 FUNDS ALLOCATED TO OSD IRM PROJECTS.

Table E-6 shows the funds earmarked for OSD IRM projects and programs in FY87 and FY88, and designates the sponsor of each project, as abbreviated here. The same abbreviations also apply in Section 1.5.

ADP	=	Automatic Data Processing
AI	=	Artificial Intelligence
ASD(C)	=	Assistant Secretary of Defense (Comptroller)
ASD(C3I)	=	Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)
ASD(FM&P)	=	Assistant Secretary of Defense (Force Management and Personnel)
ASD(HA)	=	Assistant Secretary of Defense (Health Affairs)
ASD(P&L)	=	Assistant Secretary of Defense (Production and Logistics)
ASD(RA)	=	Assistant Secretary of Defense (Reserve Affairs)
AtSD(IO)	=	Assistant to the Secretary of Defense for Intelligence Oversight
BF	=	Budget and Finance
CAD	=	Computer-Aided Design
CD	=	Correspondence and Directives
DCOAR	=	Directorate for Computer and Office Automation Resources
DDR&E	=	Director, Defense Research and Engineering
DEARAS	=	DoD Emergency and Retrieval Analysis System
DFVA	=	Director of Federal Voting Assistance
DIOR	=	Director for Information Operations and Reports
DOT&E	=	Director, Operational Test and Evaluation
DPA&E	=	Director, Program Analysis and Evaluation
DREF	=	Directorate for Real Estate and Facilities
DSIO	=	Defense Spares Initiatives Office

DSS-W	=	Defense Supply Service-Washington
ES	=	Executive Secretariat
FORDTIS	=	Foreign Disclosure and Technical Information System
GC	=	General Counsel
IRIS	=	Intelligence Resource Information System
JCS	=	Joint Chiefs of Staff
LAN	=	Local-Area Network
MIS	=	Management Information System
NAF	=	Nonappropriated Funds
OA	=	Office Automation
ONA	=	Office of Net Assessment
PC	=	Personal Computer
PECI	=	Productivity-Enhancing Capital Investment
POL	=	Petroleum, Oils, and Lubricants
PS	=	Personnel and Security
RFI	=	Request for Information
RFP	=	Request for Proposal
SECDEF	=	Secretary of Defense
SM	=	Directorate for Real Estate and Facilities
USD(P)	=	Under Secretary of Defense (Policy)
WARMAPS	=	Wartime Manpower Planning System

TABLE E-2

COMPONENT INFORMATION TECHNOLOGY BUDGETS IN FY88

(Thousands of dollars)

OSD component	FY87 budget in each information technology program						Component's total information technology budget
	01	02	03	04	05	06	
ASD (Production and Logistics)	3,565	18		394	315	327	4,620
ASD (Command, Control, Communications, and Intelligence)	835	122			929		1,886
ASD (Comptroller)		6,455					6,455
Executive Secretary			1				1
ASD (Force Management and Personnel)	1,331	149	74	523		144	2,221
Foreign Disclosure Technical Information System	2,130						2,130
Federal Voting Assistance Program	10						10
General Counsel	648						648
ASD (Health Affairs)			12	1,110			1,122
Assistant to the Secretary of Defense (AtSD) (Intelligence Oversight)			22				22
Director, Net Assessment	378		209				586
ASD (Public Affairs)				1,424			1,424
Director, Program Analysis and Evaluation	1,954	3,941	831		224		6,949
USD (Policy)	550		17,097				17,647
ASD (Reserve Affairs)	326		3	376	79	139	923
Director, Defense Research and Engineering		9,001	4,195				13,196
Director, Operational Test and Evaluation			344				344
WHS		694					694
Budget and Finance							
Director for Computer and Office Automation Resources	8,540		3,489	5,617	7,556	3716	28,917
Correspondence and Communications			75	75			149
Director for Information Operations and Reports				1,430			1,430
Personnel & Security				109			109
Space Management	158				3,824		3,983
Total	20,415	20,378	26,352	11,069	12,927	4,327	95,468

TABLE E-3
COMPONENT INFORMATION TECHNOLOGY BUDGETS IN FY89
(Thousands of dollars)

OSD component	FY87 budget in each information technology program						Component's total information technology budget
	01	02	03	04	05	06	
ASD (Production and Logistics)	3,284	18		273	316	614	4,505
ASD (Command, Control, Communications, and Intelligence)	664	124			758		1,546
ASD (Comptroller)		5,076					5,076
Executive Secretary			1				1
ASD (Force Management and Personnel)	1,474	150	75	640		148	2,487
Foreign Disclosure Technical Information System	2,480						2,480
Federal Voting Assistance Program				39			39
General Counsel	900						900
ASD (Health Affairs)			14	939			953
AtSD (Intelligence Oversight)			26				26
Director, Net Assessment	375		206				581
ASD (Public Affairs)				964			964
Director, Program Analysis and Evaluation	1,906	4,026	903		286		7,122
USD (Policy)	2,908		15,897				18,805
ASD (Reserve Affairs)	336		3	388	75	79	882
Director, Defense Research and Engineering		8,309	3,611				11,920
Director, Operational Test and Evaluation			796				796
WHS		671					671
Budget and Finance							
Director for Computer and Office Automation Resources	10,604		6,468	8,573	10,700	4,000	40,346
Correspondence and Communications			213	77			290
Director for Information Operations and Reports				1,485			1,485
Personnel and Security				99			99
Space Management					489		489
Total	24,932	18,374	28,212	13,477	12,625	4,842	102,462

TABLE E-4
COMPONENT INFORMATION TECHNOLOGY BUDGETS IN FY88
(Percentages)

OSD component	Percentage of allocation in each information technology program						Percentage of OSD information technology budget
	01	02	03	04	05	06	
ASD (Production and Logistics)	17			4	2	8	5
ASD (Command, Control, Communications, and Intelligence)	4	1			7		2
ASD (Comptroller)		32					7
Executive Secretary				<1			<1
ASD (Force Management and Personnel)	7	1		5		3	2
Foreign Disclosure Technical Information System	10						2
Federal Voting Assistance Program	<1						1
General Counsel	3						1
ASD (Health Affairs)				10			1
AtSD (Intelligence Oversight)			<1				1
Director, Net Assessment	2		1				1
ASD (Public Affairs)				13			1
Director, Program Analysis and Evaluation	10	19	3		2		7
USD (Policy)	3		65				18
ASD (Reserve Affairs)	2			3	1	3	1
Director, Defense Research and Engineering		44	16				14
Director, Operational Test and Evaluation			1				<1
WHS		3					1
Budget and Finance							
Director for Computer and Office Automation Resources	42		13	51	58	86	30
Correspondence and Communications				1			<1
Director for Information Operations and Reports				13			1
Personnel and Security				1			<1
Space Management	1				30		4

TABLE E-5
COMPONENT INFORMATION TECHNOLOGY BUDGETS IN FY89
(Percentages)

OSD component	Percentage of allocation in each information technology program						Percentage of OSD information technology budget
	01	02	03	04	05	06	
ASD (Production and Logistics)	13			2	3	13	4
ASD (Command, Control, Communications, and Intelligence)	3	1			6		2
ASD (Comptroller)		28					5
Executive Secretary				<1			<1
ASD (Force Management and Personnel)	6	1		5		3	2
Foreign Disclosure Technical Information System	10						2
Federal Voting Assistance Program				<1			<1
General Counsel	4						1
ASD (Health Affairs)				7			1
AtSD (Intelligence Oversight)			<1				<1
Director, Net Assessment	2		1				1
ASD (Public Affairs)				7			1
Director, Program Analysis and Evaluation	8	22	3		2		7
USD (Policy)	12		56				18
ASD (Reserve Affairs)	1			3	1	2	1
Director, Defense Research and Engineering		45	13				12
Director, Operational Test and Evaluation			3				1
WHS		4					1
Budget and Finance							
Director for Computer and Office Automation Resources	43		23	64	85	83	39
Correspondence and Communications			1	1			<1
Director for Information Operations and Reports				11			2
Personnel and Security				1			<1
Space Management	4				15		<1

TABLE E-6

OSD INFORMATION PROGRAMS AND PROJECTS

(Thousands of dollars)

Program no.	Program title	Component	Project no.	Project title	Funds	
					1987	1988
01	Component Mission Support	ASD(P&L)	01	General Analyses	35	50
		ASD(P&L)	02	ADP Hardware	8	7
		ASD(P&L)	03	ADP Hardware Maintenance	226	7
		ASD(P&L)	06	General Support/Software	17	18
		ASD(P&L)	07	Readiness Decision Support System	70	100
01	Component Mission Support	ASD(P&L)	08	Installation Database	4	5
		ASD(P&L)	09	Defense Energy Information System	106	200
		ASD(P&L)	10	Petroleum Quality Data System	66	207
		ASD(P&L)	11	Logistics Planning	7	10
		ASD(P&L)	12	International Logistics Support and Database	119	0
01	Component Mission Support	ASD(P&L)	13	Defense Maintenance Information System	63	15
		ASD(P&L)	14	Secondary Item Management Analysis	105	50
		ASD(P&L)	15	Petroleum Disruption Response	87	60
		ASD(P&L)	16	Spare Parts MIS and DSIO Automated	31	89
		ASD(P&L)	18	POL Distribution Model	0	115
01	Component Mission Support	ASD(P&L)	19	Fuels Producibility	0	130
		ASD(P&L)	20	Energy Information Analysis	0	30
		ASD(P&L)	21	Boeing Computer/Copper Impact and COMPUSTAT	28	38
		ASD(P&L)	22	Automating Acquisition Regulation	222	82
		ASD(P&L)	23	Open Research Applied to Acquisition	56	30
01	Component Mission Support	ASD(P&L)	24	Logistics ADP Requirements	437	648
		ASD(P&L)	26	Integrated Logistics Support	70	150
		ASD(P&L)	27	MIS for Spare Parts Management	36	0
		ASD(P&L)	28	Contractor Identification Number System	42	70
		ASD(P&L)	31	Defense Industrial Network	70	102

TABLE E-6

OSD INFORMATION PROGRAMS AND PROJECTS (Continued)

(Thousands of dollars)

Program no.	Program title	Component	Project no.	Project title	Funds	
					1987	1988
01	Component Mission Support	ASD(P&L)	35	Industrial Productivity Conference	0	4
		ASD(P&L)	36	Manufacturing Technology Program	36	36
		ASD(P&L)	38	Weapon System Readiness and Support	7	10
		ASD(P&L)	39	Office Automation Hardware (Sun)	1,553	828
01	Component Mission Support	DCOAR	02	DPA&E Support	287	1,889
		DCOAR	25	Decision Support Terminal System	928	1,213
		DCOAR	26	Office Automation Computer Systems	1,961	3,483
		DCOAR	27	Network Performance and Capital Budget	125	454
		DCOAR	29	Requirements Analysis	250	500
		DCOAR	30	Administrative Network Support	601	1,000
01	Component Mission Support	ASD(C3I)	03	IRIS	569	835
		ASD(FM&P)	08	Decision Support Systems Development	45	74
		ASD(FM&P)	09	NAF Personnel MIS	14	22
		ASD(FM&P)	10	All-Volunteer Force Database	9	19
		ASD(FM&P)	11	Computerized Adaptive Testing System	70	149
01	Component Mission Support	ASD(FM&P)	12	Recruiting Resources Tracking System	1	19
		ASD(FM&P)	13	WARMAPS ADP Support	166	301
		ASD(FM&P)	14	Defense Personnel Analysis System	124	167
		ASD(FM&P)	15	Mobilization Training Base Cap	29	63
		ASD(FM&P)	16	Manpower Management/ Program Review	18	33
01	Component Mission Support	ASD(FM&P)	17	Civilian Assets for Mobilization	23	41
		ASD(FM&P)	18	Manpower Research	203	371
		ASD(FM&P)	19	PECI Tracking Systems	7	11

TABLE E-6

OSD INFORMATION PROGRAMS AND PROJECTS (Continued)

(Thousands of dollars)

Program no.	Program title	Component	Project no	Project title	Funds	
					1987	1988
01	Component Mission Support	ASD(FM&P)	20	Military/Civilian Manpower Requirements	6	18
		ASD(FM&P)	21	Recruit Market Network Files Update	90	42
		ASD(FM&P)	23	Sixth Quadrennial Review Military Compensation	499	0
		FORDTIS	01	FORDTIS Defense Technical Security and Disclosure	1,246	2,130
01	Component Mission Support	GC	01	International Treaties	616	648
		ONA	01	Intelligence Databases	69	167
		ONA	02	Balance Production	82	95
		ONA	05	Special Studies	42	116
		DPA&E	02	Contract Maintenance of Models	449	455
		DPA&E	05	Contract Economic Forecasting Model	254	355
01	Component Mission Support	DPA&E	06	Contract Database Development and Maintenance Support	649	915
		DPA&E	09	Enhanced Modeling Support	0	230
		USD(P)	02	Map/Graphics Support	0	98
		USD(P)	03	Crisis Coordination Center	2,726	293
		USD(P)	04	DEARAS	1	110
01	Component Mission Support	USD(P)	05	Security Assistance Data Base	0	49
		ASD(RA)	10	Hardware Maintenance	78	81
		ASD(RA)	14	Data Communication Services	42	28
		ASD(RA)	15	Application Support	252	178
		ASD(RA)	16	System Support	47	40
		SM	03	Security Systems (Metaphor)	1,033	158
02	Program Budget and Analysis	ASD(P&L)	25	Defense Resources Model	13	18
		BF	01	Financial Management System	454	694
		ASD(C3I)	01	Automated Resource Management System	178	122
		ASD(C)	01	Programming and Budgeting for DASD(C)	0	0
		ASD(C)	05	Comptroller Projects Consolidation	5,164	6,454
		ASD(FM&P)	02	Manpower Analyses and Evaluation	45	74

TABLE E-6

OSD INFORMATION PROGRAMS AND PROJECTS (Continued)

(Thousands of dollars)

Program no.	Program title	Component	Project no.	Project title	Funds	
					1987	1988
02	Program Budget and Analysis	ASD(FM&P)	06	Analytical Model	41	74
		DPA&E	03	7CG Processing Charges	1,493	1,953
		DPA&E	04	Remote Computer Processing Charges	109	347
		DPA&E	07	Decision Support System	275	440
		DPA&E	08	Contract MULTICS Software Conversion	0	1,200
02	Program Budget and Analysis	DPA&E	10	Distributed Computing Support	0	0
		DDR&E	01	Program Budget System	4,975	8,252
		DDR&E	02	SURVIAC, Booz-Allen	82	145
		DDR&E	03	MULTICS Replacement/ Software	0	604
03	Secure Office Automation	DCOAR	05	Management Information Centers	0	1,469
		DCOAR	06	Network Security Evaluation	228	772
		DCOAR	24	Secure Gateway	132	1,248
		CD	02	Cables Division JCS Message Center	0	75
03	Secure Office Automation	ES	01	OSD Reports	19	1
		ES	02	SecDef Support	16	0
		ASD(FM&P)	05	LAN Support	45	74
		ASD(HA)	03	Secure PC Network	80	12
		AtSD(IO)	01	Word Processing	0	22
03	Secure Office Automation	ONA	03	Administrative Support	102	76
		ONA	04	Correspondence/Document Control	27	133
		DPA&E	01	Secure Ethernet Network Resources	562	831
		USD(P)	01	Policy Secure OA LAN	5,479	17,097
		ASD(RA)	08	TEMPEST Equipment Upgrade	7	3
03	Secure Office Automation	DDR&E	04	Secure LAN	3,244	3,267
		DDR&E	05	RFI for Shielded Facility/ Management Control Facility	0	334
		DDR&E	06	Defense Communication Teleconferencing Network	0	193

TABLE E-6

OSD INFORMATION PROGRAMS AND PROJECTS (Continued)

(Thousands of dollars)

Program no.	Program title	Component	Project no.	Project title	Funds	
					1987	1988
03	Secure Office Automation	DDR&E	07	Decision Support Center	0	402
		DOT&E	01	Secure OA Network	345	344
04	Nonsecure Office Automation	ASD(P&L)	04	Office of the Future	131	194
		ASD(P&L)	05	LAN Support	211	200
		DCOAR	07	Datapoint Replacement/ Standalone	3,174	4,106
		DCOAR	08	Video Teleconference	101	49
		DCOAR	10	Automated Records Manage- ment	219	1,062
04	Nonsecure Office Automation	DCOAR	01	Inforex 9000	59	75
		ASD(FM&P)	01	ADP Hardware Lease	5	5
		ASD(FM&P)	03	ADP Hardware Maintenance	95	341
		ASD(FM&P)	22	Office Automation Moderni- zation	225	177
04	Nonsecure Office Automation	DFVA	01	Voting Survey	0	6
		DFVA	02	Database Transfer	0	4
		ASD(HA)	01	Office Automation	456	458
		ASD(HA)	02	Defense Medical Information System	519	652
		DIOR	05	DIOR Projects Consolidation (1-12-87)	1,294	1,430
04	Nonsecure Office Automation	ASD(PA)	01	Office Automation	1,280	1,424
		PS	01	Air Force Support Reimbursement	90	71
		PS	02	Equipment Upgrade and Expansion	24	38
		PS	04	Job Vacancy Information System	46	0
		PS	05	Xerox and Metaphor Equipment Maintenance	9	0
04	Nonsecure Office Automation	ASD(RA)	01	Workstation Complement	186	159
		ASD(RA)	02	Software - Miscellaneous Hardware	31	27
		ASD(RA)	04	Network Connectivity	60	133
04		ASD(RA)	05	Graphics - Miscellaneous Hardware	53	50

TABLE E-6

OSD INFORMATION PROGRAMS AND PROJECTS (Continued)

(Thousands of dollars)

Program no	Program title	Component	Project no.	Project title	Funds	
					1987	1988
04	Nonsecure Office Automation	ASD(RA)	06	Microcomputer-Mainframe Link	7	2
05	Operational/Management Support	ASD(RA)	12	Information Security	7	4
		ASD(P&L)	32	LMI Support	79	115
		ASD(P&L)	33	Decision Support	70	200
		DCOAR	11	DSS-W Automation	1,082	2,425
		DCOAR	13	IRM Planning	816	777
		DCOAR	16	Gateway/Interoperable Systems	619	1,546
05	Operational/Management Support	DCOAR	18	Database Machines	921	1,610
		DCOAR	28	Administrative Systems Development	317	1,198
		ASD(C3I)	02	General Office Support	1,357	929
		ASD(C)	02	Defense Privacy Office Systems of Records	0	0
05	Operational/Management Support	DPA&E	11	RFP Development and General ADP	0	224
		ASD(RA)	17	Facilities Maintenance	93	79
		DSMS	01	Administrative Tracking	939	1,555
		DSMS	02	CAD Engineering System	0	1,998
		DSMS	04	Computer Design System	0	271
		ASD(P&L)	34	Utilizing AI in Logistics Management	122	233
06	Technology Applications	ASD(P&L)	37	ADP Interoperability	105	94
		DCOAR	20	Training (Interactive Video renamed)	748	1,062
		DCOAR	21	Decision Support AI	374	1,105
		DCOAR	22	Information Retrieval System	477	1,549
		ASD(FM&P)	04	Office of the Future	67	144
		ASD(RA)	11	Executive Decision Support Center	1,419	139

1.5 DESCRIPTIONS OF OSD IRM PROJECTS.

In this section, every present OSD IRM project is described briefly.

BF01 – WHS (Budget and Finance)

Title: Financial Management System

This system provides accounting and reporting; trust fund investment; and budget formulation system for base-, intermediate-, and department-levels supporting OSD budget planning and execution; and financial operations.

CA01 – WHS (Directorate for Computer and Office Automation Resources)

Title: Large-Scale Computer Support

Large-Scale Computer Support/MULTICS Replacement provides for the acquisition of large-scale computational systems needed to support OSD. Current support is provided by the USAF Seventh Communications Group (7CG), which can support only 10 percent of OSD's requirements. These systems will replace and expand MULTICS, which is saturated and obsolete.

CA02 – WHS (Directorate for Computer and Office Automation Resources)

Title: PAE/CINC Support

The DPAE/CINC project supports upgrading the automated secure data links to the CINCs, thus vastly increasing the level of support provided to the CINCs by OSD.

CA03 – WHS (Directorate for Computer and Office Automation Resources)

Title: Program Budget System Redesign

Because of the obsolescence of MULTICS, which must be replaced before FY90, significant efforts are being made to redesign the Program Budget System to fully exploit newer, lower-cost systems that may be used as a distributed network of minicomputers linking major OSD components that interact on budget issues.

CA04 – WHS (Directorate for Computer and Office Automation Resources)

Title: Fiber Optics Cabling

This project provides for the installation of fiber optics cabling throughout the Pentagon, to link all OSD agencies, JCS, the Services, and OSD components.

CA05 – WHS (Directorate for Computer and Office Automation Resources)

Title: Management Information Centers (SecDef)

This project provides the Secretary of Defense with up-to-date automation equipment to include portable equipment for linking the Secretary and his principal staff with other essential systems.

CA06 – WHS (Directorate for Computer and Office Automation Resources)

Title: Network Security Evaluation

This project provides for professional evaluation and analysis of the security risks of the automation networks in OSD.

CA07 – WHS (Directorate for Computer and Office Automation Resources)

Title: Manage and Administer Datapoint Arcnet

This project provides for replacement of Datapoint standalone equipment, which is becoming worn out and obsolete. The replacement equipment is essential to OSD's day-to-day operation.

CA08 – WHS (Directorate for Computer and Office Automation Resources)

Title: Video Teleconference

This project provides for state-of-the-art teleconferencing for key executives in OSD. This capability will save valuable executive time and travel expense, thus allowing more productive time for decision-making.

CA09 – WHS (Directorate for Computer and Office Automation Resources)

Title: Integrated Correspondence Control

This project will provide OSD and its field activities with a standard correspondence control system to manage the large volume of correspondence requiring replies.

CA10 – WHS (Directorate for Computer and Office Automation Resources)

Title: Automated Records Management

This system provides for preparation of records within OSD and its field activities for the purpose of filing and storing in electronic databases. This will greatly reduce storage space requirements and improve access and use of these records.

CA11 – WHS (Directorate for Computer and Office Automation Resources)

Title: DSS-W Automation

This project provides for upgrading the automation of the contracting/ acquisition process for DoD. This will increase productivity to offset the shortage of manpower in DSS-W.

CA12 – WHS (Directorate for Computer and Office Automation Resources)

Title: OSD Personnel Administration

This project will automate the personnel administration process, using a proven Air Force system.

CA13 – WHS (Directorate for Computer and Office Automation Resources)

Title: IRM Planning

This project is designed to provide the methodology for developing and automating a highly integrated and efficient information resource system for OSD.

CA14 – WHS (Directorate for Computer and Office Automation Resources)

Title: Disaster Recovery System

This project will develop an automated system to enable DoD to plan for disasters and manage them when they come.

CA15 – WHS (Directorate for Computer and Office Automation Resources)

Title: Space Defense Initiative Office (SDIO) Secure Network

At the request of Gen. Abramson, and with the concurrence of the DASD (Administration), DCOAR is helping SDIO to develop a secure net that will interface SDIO with all the in-house DoD labs and major contractors that support the space defense initiative effort.

CA16 – WHS (Directorate for Computer and Office Automation Resources)

Title: Establish and Develop an Interoperability Program

The gateway systems and terminal emulation projects provide: (1) transparent access to databases and DoD laboratories needed by the research and development community, (2) user-friendly access to DoD databases and contractor databases by the OSD staff, and (3) ability to access different systems and networks from major terminal types.

CA17 – WHS (Directorate for Computer and Office Automation Resources)

Title: Terminal Emulation

The gateway systems and terminal emulation projects provide: (1) transparent access to databases and DoD laboratories needed by the RDT&E community, (2) user-friendly access to DoD databases and contractor databases by the OSD staff, and (3) ability to access different systems from major terminal types.

CA18 – WHS (Directorate for Computer and Office Automation Resources)

Title: Database Machines

This project will provide the hardware and software needed to extend the ability of existing minicomputers by enabling database operations to be done in parallel with other processing activities. Specialized computers will also provide gateways among hardware systems for more efficient sharing of data.

CA19 – WHS (Directorate for Computer and Office Automation Resources)

Title: Optical Disk Systems

This project will provide OSD with a means of storing both large operational and archival databases. Initial applications for storage and retrieval of map graphics and intelligence documents are planned as prototype developments.

CA20 – WHS (Directorate for Computer and Office Automation Resources)

Title: Training (Interactive Video renamed)

This project will provide OSD with a training tool that will enable component offices to create, update, and maintain their own libraries of functional staff training modules.

CA21 – WHS (Directorate for Computer and Office Automation Resources)

Title: Decision Support Artificial Intelligence (AI)

This project provides the OSD staff with the specific software purchases and related training needed to employ newly developed decision support systems.

CA22 – WHS (Directorate for Computer and Office Automation Resources)

Title: Information Retrieval System

This system will provide OSD with a full-text, document storage and retrieval capability that is needed to make policy coordination documents quickly available to OSD staff and managers.

CA24 – WHS (Directorate for Computer and Office Automation Resources)

Title: Develop a Secure Gateway Capability

CA25 – WHS (Directorate for Computer and Office Automation Resources)

Title: Decision Support Terminal System

CA26 – WHS (Directorate for Computer and Office Automation Resources)

Title: Office Automation Computer Systems

CA27 – WHS (Directorate for Computer and Office Automation Resources)

Title: Network Performance and Capital Budget

CA28 – WHS (Directorate for Computer and Office Automation Resources)

Title: Administrative Systems Development

CA29 – WHS (Directorate for Computer and Office Automation Resources)

Title: Requirements Analysis

CA30 – WHS (Directorate for Computer and Office Automation Resources)

Title: Administrative Network Support

CD01 – WHS (Correspondence and Directives)

Title: INFOREX 9000

This project provides for retrieval of documents, destruction of classified documents, Top Secret inventory maintenance, and tracking of overdue reports, in support of control, retrieval, and tracking of correspondence addressed to and from the Secretary and Deputy Secretary of Defense.

CD02 – WHS (Correspondence and Directives)

Title: Cables Division JCS Message Center

This project interfaces with the JCS Information Services Center computer system to make it possible to review incoming messages on video screens, in support of screening, evaluation, and distribution of communications addressed to the Secretary and Deputy Secretary of Defense.

CI01 – ASD (Command, Control, Communications, and Intelligence)

Title: Automated Resource Management System

This project provides C3I program data needed for PPBS decisionmaking. The data reflects the status of all DoD C3I programs, to include Joint-Service programs.

CI02 – ASD (Command, Control, Communications, and Intelligence)

Title: General Office Support

This project applies resources to intra-office contract administration, document production and distribution, and personnel/supply administration.

CI03 – ASD (Command, Control, Communications, and Intelligence)

Title: Intelligence Resource Information System (IRIS)

Funds IRIS program.

CO01 – ASD (Comptroller)

Title: Programming and Budgeting for the OASD(C)

This project provides for support of OASD(C) budget execution and planning and system management.

CO02 – ASD (Comptroller)

Title: Defense Privacy Office, Systems of Records

This project carries out central computing and reporting ADP functions for collecting and distributing PPBS information in support of OASD(C) planning, programming, and budgeting systems.

CO03 – ASD (Comptroller)

Title: Gateways Between Networks for the OASD(C)

This project connects OASD(C) personnel to printing, computing, and storage facilities, and to other organizations for collecting and distributing PPBS information in support of OASD(C) planning, programming, budgeting, and system management.

CO04 – ASD (Comptroller)

Title: Networking for the OASD(C)

CO05 – ASD (Comptroller)

Title: Comptroller Projects Consolidation

ES01 – Executive Secretary

Title: OSD Reports

This project produces the *Soviet Military Power* Annual Report, and other reports and documents in support of the Secretary of Defense.

ES02 – Executive Secretary

Title: SecDef Support

This project carries out secretarial functions in support of the daily activities of the Secretary of Defense.

FM01 – ASD (Force Management and Personnel)

Title: ADP Hardware Lease

This project deals with rental and maintenance of remote computer terminals used in support of FM&P project officers, programmers, and analysts.

FM02 – ASD (Force Management and Personnel)

Title: Manpower Analyses and Evaluation

This project provides 7CG support for automated systems, including ADP operating and data storage costs and technical assistance in support of the responsibility to advise the Secretary of Defense about adequacy of programmed resources to support manpower training, readiness, mobilization, and approved force levels.

FM03 – ASD (Force Management and Personnel)

Title: ADP Hardware Maintenance

This project provides funds for maintenance of Government-owned office automation equipment in support of FM&P activities.

FM04 – ASD (Force Management and Personnel)

Title: Office of the Future

This project provides for procurement of office automation equipment and additional office automation requirements studies and evaluation and acceptance

support to aid in the continued implementation and use of equipment procured in support of FM&P activities.

FM05 – ASD (Force Management and Personnel)

Title: Local-Area Network Support

This project determines the feasibility of alternatives to MITRE's evaluation of electronic communications between systems through use of a LAN within FM&P, and funds the installation of a LAN in support of FM&P activities.

FM06 – ASD (Force Management and Personnel)

Title: Analytical Model

This project provides MULTICS support for cost, mobilization, and other analytical models being developed, modified, or maintained by elements of the FM&P staff, including:

- Mobilization Training Base Capacity (MOBTRAC) – estimates the maximum training capacity of mobilization training bases
- Civilian Manpower Costs (CIVMANCO) – produces civilian manpower cost data by various categories, based on FYDP data
- Manpower Cost Reduction (MCR) – reduces total manpower costs – civilian, active military, and reserves – by various categories, based on Five Year Defense Plan (FYDP) data

in support of the responsibility to advise the Secretary of Defense as to adequacy of programmed resources to support manpower training, readiness, mobilization, and approved force levels.

FM07 – ASD (Force Management and Personnel)

Title: General Software Support

This project provides for procurement of off-the-shelf software packages for data storage and manipulation, budgeting, and financial projections, and project scheduling and planning in support of the responsibility to advise the Secretary of Defense about the adequacy of programmed resources to support manpower training, readiness, mobilization, and approved force levels.

FM08 – ASD (Force Management and Personnel)

Title: Decision Support Systems Development

This project determines FM&P staff needs in decision support: a survey of available decision support packages, analyzing these packages for the required capabilities, design, analysis, programming, and implementation, using the new

office automation hardware and software in support of an OASD FM&P Decision Support System.

FM09 – ASD (Force Management and Personnel)

Title: Nonappropriated Fund (NAF) Personnel Management Information System

This project develops a system for efficiently accessing and interfacing with DoD component computers and the DoD Personnel Policy Office database of the NAF work force, in support of managing the worldwide morale, recreation, and welfare work force.

FM10 – ASD (Force Management and Personnel)

Title: All Volunteer Force (AVF) Database

This project funds 7CG to produce special reports on military force composition, on the basis of historical data provided by the Services and the Defense Manpower Data Center (DMDC) in support of maintaining a record of the military composition of the AVF.

FM11 – ASD (Force Management and Personnel)

Title: Computerized Adaptive Testing (CAT) System

This project provides for procurement of 20 microprocessors for simulation of the testing environment, and research on personnel testing, to replace the paper-and-pencil enlistment test with CAT. Thus, it improves DoD's ability to forecast manpower quality requirements, achieve high levels of manpower readiness, assess near- and long-term accession capabilities, and initiate legislative proposals in support of military manpower acquisition.

FM12 – ASD (Force Management and Personnel)

Title: Recruiting Resources Tracking System

This project provides information to manage recruiting resources through the PPBS phases, to monitor Service and joint resources to ensure compliance with congressional program ceilings, to improve DoD's ability to achieve manpower requirements, and to advise the ASD(FM&P) and the Secretary of Defense on programs and policies affecting military recruitment in support of a cost-effective disposition of recruiting resources for the active force and Reserve Components while achieving manpower objectives.

FM13 – ASD (Force Management and Personnel)

Title: Wartime Manpower Planning System (WARMAF) ADP Support

This project reviews and evaluates programs and policies for quantitative and qualitative wartime requirements, develops manpower requirements, and develops

manpower programs to meet Service requirements in support of manpower mobilization.

FM14 – ASD (Force Management and Personnel)

Title: Defense Personnel Analysis System (DPAS)

This project provides an on-line, menu-driven, quick-response graphics and tabular data display system that uses DMDC and user-developed databases in support of active component personnel readiness.

FM15 – ASD (Force Management and Personnel)

Title: Mobilization Training Base Capacity

This project investigates training base capacity issues involving mobilization capacity of the Services, answers congressional inquiries, and addresses inter-service training requirements to identify resource shortfalls that exacerbate capacity problem in support of wartime recruit training.

FM16 – ASD (Force Management and Personnel)

Title: Manpower Management/Program Review

This project provides an automated capability to display manpower and information in meaningful categories, allowing in-depth analysis of FYDP trends and Service requirements in support of military and civilian manpower management.

FM17 – ASD (Force Management and Personnel)

Title: Civilian Assets for Mobilization Planning

This project develops systems for assuring an ability to assess civilian mobilization needs and methods for locating resources in support of DoD civilian mobilization preparedness.

FM18 – ASD (Force Management and Personnel)

Title: Manpower Research

This project funds contractor-provided analytical support that is not available within OASD(FM&P) or DoD, addressing special manpower-related issues in support of the requirement to develop policies, conduct analyses, provide advice, and recommend manpower programs, force structure, and qualitative manpower requirements.

FM19 – ASD (Force Management and Personnel)

Title: Productivity Enhancing Capital Investment (PECI) Tracking Systems

This project enables analysts to interrogate a database and track project progress in support of DoD program for capital equipment and labor substitution efforts.

FM20 – ASD (Force Management and Personnel)

Title: Military/Civilian Manpower Requirements Management System

This project develops and implements a mechanized data storage and retrieval system for military/civilian manpower data, providing data manipulation capabilities, in support of military/civilian manpower management.

FM21 – ASD (Force Management and Personnel)

Title: Recruit Market Network Files Updates and Enhancements

This project provides DoD analysts and policy-makers and Service recruit market research analysts with current data on military-age youth by purchasing, through the Joint Market Research Program, data files, file updates, and analytic software that are maintained on the Recruit Market Network, which is operated by the DMDC, in support of the AVF.

FM22 – ASD (Force Management and Personnel)

Title: Office Automation Modernization [ASD(P&L)]

This project funds purchases of OA hardware.

FM23 – ASD (Force Management and Personnel)

Title: Sixth Quadrennial Review Military Compensation (6QRMC)

This project provides funds for ADP support of the 6QRMC staff. It includes computer timesharing costs and other ADP services.

FO01 – Foreign Disclosure and Technical Information System

Title: Defense Technology Security and Disclosure Programs, Foreign Disclosure and Technical Information System

This project provides analysts and decision makers with data entry, analysis, administration, and management of three categories of databases:

- Tracking and Assignment – active cases

- Historical – cases processed by DoD
- Reference – case review data.

in support of the disclosure decision process and the technology security case process in meeting the USD(P) responsibility assigned by the National Disclosure Policy, the Export Administration Act, and the Arms Export Control Act.

FV01 – Federal Voting Assistance

Title: Voting Survey

This project surveys military-unit voting officers and election officials after general elections, provides distribution, modifications, and coding of survey forms, compiles results, and submits reports in support of the Federal Voting Assistance Program.

FV02 – Federal Voting Assistance

Title: Database Transfer

This project transfers database files to computer and provides individual terminals for staff members in support of the Federal Voting Assistance Program.

FV03 – Federal Voting Assistance

Title: Voting Guide

This project, in coordination with military installations, embassies, and consulates, provides computerization of the Voting Guide to be available worldwide in support of the Federal Voting Assistance Program.

GC01 – DoD General Counsel

Title: International Treaties

This project maintains an international treaties database and related information retrieval system.

HA01 – ASD (Health Affairs)

Title: Office Automation

This project funds procurement of OA equipment.

HA02 – ASD (Health Affairs)

Title: Defense Medical Information System (DMIS)

HA03 – ASD (Health Affairs)

Title: Secure Personal Computer Network

This project provides word processing in a secure environment in support of Health Affairs activities.

IO01 – ASD (Intelligence Oversight)

Title: Word Processing

This project provides word processing in a secure environment in support of Intelligence Oversight activities.

IR01 – WHS (Directorate for Information Operations and Reports)

Title: Budget Requirements for the Information Control Division

This project manages the DoD forms, data elements and data codes, forms design, and reports, develops and maintains the DIOR Information Locator System, reviews DoD issuances, and administers the Information Control Division in support of OASD(C) responsibilities defined by DoD Directive 5118.3.

IR02 – WHS (Directorate for Information Operations and Reports)

Title: Manpower Management Information Division

This project maintains and operates the following reporting systems:

- Military Manpower Reporting System
- Worldwide Manpower Distribution by Country Reporting System
- Military Manpower Press Release System
- Federal Civilian Employment Reporting System
- Report of Employment by State System
- Indirect Hires Reporting System
- Health Manpower Information System
- Selected Medical Care Statistics System
- General Flag Officer Billet Information System
- Real and Personal Property System

- NATO Mutual Support System
- Working Capital Funds System
- Motor Vehicle Report System
- Presidential Protection Assistance Act System
- Worldwide Active Duty Casualty System
- Vietnam Conflict Casualty System
- Korean Conflict Casualty System
- Consolidated Federal Funds Report System
- Personnel and Payroll Outlays System
- Distribution of Personnel by Operating Location System
- Census of Manufacturing System
- Supply Systems Inventory System.

in support of the requirements of the National Security Act of 1947 and the responsibility of ASD(C) to collect, analyze, and report management information for the Office of the Secretary of Defense and, as required, for the Office of Management and Budget (OMB), Congress, the General Accounting Office, and other agencies outside DoD.

IR03 – WHS (Directorate for Information Operations and Reports)

Title: Procurement and Economic Information Division

This project develops, maintains, and operates the DoD Acquisition Management Data System and the Summary Subcontract Report System, which consist of statistical and archival information related to DoD-wide contract actions; administers essential information flows to the OSD and WHS, which reflect contract statistics; and gathers, analyzes, and presents economic indicator statistics in support of DIOR responsibilities to assure the validity and timeliness of acquisition data and to prepare comprehensive reports and analyses reflecting the progress and status of approved acquisition plans, programs, and objectives of DoD.

IR04 – WHS (Directorate for Information Operations and Reports)

Title: Special Projects Division

This project manages, operates, and maintains HP3000 minicomputer and HP150 network and microcomputers; investigates, reviews, develops, and acquires system and general-purpose software; prepares information technology reports for OASD(C); and carries out the general administration functions of budget tracking,

personnel actions, procurement actions, and security actions in support of DIOR responsibilities, as outlined in DoD Directive 5518.3.

IR05 – Directorate for Information Operations and Reports (DIOR)

Title: DIOR Projects Consolidation

NA01 – Office of Net Assessment

Title: Intelligence Databases

This project provides a basis for joint use and exchange of classified intelligence data associated with the Global Force Trend Data (GFTD), receiving contractor support arranged by Central Intelligence Agency (CIA) and coordination with a database acquisition effort in CIA and the Defense Intelligence Agency (DIA) in support of the interagency agreement between OSD, the Military Departments, and CIA, aimed at development of a common order-of-battle database.

NA02 – Office of Net Assessment

Title: Balance Production

This project, in support of the Secretary of Defense and other political-military decision makers' formulation of strategy and national security policy, compares and analyzes NATO and Warsaw Pact forces, Mideast forces, East Asia forces, Southwest Asia forces, and Pacific forces in terms of quantity, quality, location, and logistics.

NA03 – Office of Net Assessment

Title: Administrative Support

This project provides for information resources devoted to intra-office distribution, contract administration, security administration, personnel administration, and supply administration in support of all ONA activities.

NA04 – Office of Net Assessment

Title: Correspondence and Document Control

This project provides for recording, storing, and retrieving correspondence and documents that originate in or are distributed by ONA to meet its correspondence and document control responsibilities.

NA05 – Office of Net Assessment

Title: Special Studies

This project provides for special analyses and specialized modeling activities, not included in the normally assigned military balances, of regional balance of forces, economic analyses, and strategic modeling and simulation requested by the

Secretary of Defense or the Director of Net Assessment toward providing a flexible capability to respond to crises, and to address emerging issues.

PA01 – ASD (Public Affairs)

Title: Office Automation

This project provides information processing in support of ASD (Public Affairs).

PE01 – Director, Program Analysis and Evaluation

Title: Secure Ethernet Network Resources

This project provides DPA&E analysts with the capability to access mainframe computer resources from their office areas and provides compatibility for information exchange with related OSD organizations in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense.

PE02 – Director, Program Analysis and Evaluation

Title: Contract Maintenance of Strategic and Deployment Software Models

This project analyzes strategic offensive and defensive programs and evaluates theater mobility and force projection programs in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense.

PE03 – Director, Program Analysis and Evaluation

Title: 7CG Computer Processing Charges

This project provides program analysis support, using the 7CG database and modeling software resources, of DPA&E's responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense.

PE04 – Director, Program Analysis and Evaluation

Title: Remote Computer Site User Resources

The project provides accessibility to 7CG mainframe computers for program execution and the resulting draft or final copy output in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense.

PE05 – Director, Program Analysis and Evaluation

Title: Contract Econometric Forecasting Modeling Support

This project, in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense,

provides forecasts of defense and defense-related demands implied by the FYDP for various goods and services, strategic materials, and categories of skilled labor through the purchase of computer time on three vendors' machines that have proprietary econometric models and economic databases.

PE06 – Director, Program Analysis and Evaluation

Title: Contract Database Development and Maintenance Support

This project, in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense, provides the contractor support for the database software and implementation of the GFTD, the Defense Force Planning Database, the Contractor Cost Data Reporting database, and the NATO Burden Sharing Database.

PE07 – Director, Program Analysis and Evaluation

Title: Decision Support Systems

This project, in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense, provides the microcomputer and minicomputer systems required for decision-making activities in DPA&E and OSD.

PE08 – Director, Program Analysis and Evaluation

Title: Contract MULTICS Software Conversion

To better understand the complexity of the problem and to establish a baseline of systems in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense, this project provides for contracting with one or two vendors to assist DPA&E with the conversion of programs and lines of code written over a 12-year period, including an initial pre-conversion study of software.

PE09 – Director, Program Analysis and Evaluation

Title: Enhanced Modeling Support

To improve the modeling capability of DPA&E in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense, this project acquires computer time on a Cray-like machine, acquires a floating point processor, and initiates new efforts to model weapon systems.

PE10 – Director, Program Analysis and Evaluation

Title: Distributed Computing Support

This project, in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense, enhances DPA&E's in-house capability for general data processing support through acquisition of a database machine, such as the VAX 785.

PE11 – Director, Program Analysis and Evaluation

Title: RFP Development and General ADP Services

This project provides the resources to develop hardware and software specifications and request for proposal (RFP) documentation required to satisfy the acquisition plans of DPA&E, including personnel resources needed to support data entry functions and programming related to microcomputers and minicomputers, in support of DPA&E responsibility for performing analyses, identifying issues, and evaluating alternative programs for the Secretary of Defense.

PL01 – ASD (Production and Logistics)

Title: General Analyses

This is a joint effort between OASD(P&L) and 7CG for automated system design, development, operations, and budgeting for both ongoing and planned OASD(P&L) study requirements in support of OASD(P&L) management planning, analysis, as well as resource allocation for miscellaneous short-range projects and systems accounting and maintenance.

PL02 – ASD (Production and Logistics)

Title: ADP Hardware Acquisition

This project provides funds for purchase, rental, and maintenance of remote computer terminals used in OASD(P&L) in support of OASD(P&L) project officers, programmers, and analysts.

PL03 – ASD (Production and Logistics)

Title: ADP Hardware Maintenance

This project funds the maintenance of Government-owned office automation equipment used in support of OASD(P&L) project officers, programmers, and analysts.

PL04 – ASD (Production and Logistics)

Title: Office of the Future

This project funds the procurement of office automation equipment and additional office automation requirements studies and evaluation and acceptance support to aid in the continued implementation and use of this equipment in support of OASD(P&L) project officers, programmers, and analysts.

PL05 – ASD (Production and Logistics)

Title: LAN Support

This project funds the beginning of design, development, installation, and operation of a LAN in support of OASD(P&L) project officers, programmers, and analysts.

PL06 – ASD (Production and Logistics)

Title: General Support/Software

This project funds procurement of off-the-shelf software packages for data storage and manipulation, budgeting and financial projections, and project scheduling and planning in support of OASD(P&L) project officers, programmers, and analysts.

PL07 – ASD (Production and Logistics)

Title: Readiness Decision Support System

This project funds contractor-provided programming, analysis, and operational support for development, updating, and production of analytical data and visual displays relating to readiness and sustainability issues in support of OASD(P&L) requirements to provide input to the *Annual Defense Report*, the *Force Readiness Report*, testimony to the House and Senate Armed Services Committees, and responses to congressional inquiries.

PL08 – ASD (Production and Logistics)

Title: Installation Database

This project provides 7CG with automated systems support for producing the *Base Structure Report*, including MULTICS operating costs, data storage costs, and 7CG technical assistance to generate output used in the report in support of the OASD(P&L) requirement to explain and justify the relationship between the base structure and the proposed military force structure for the budget year in question.

PL09 – ASD (Production and Logistics)

Title: Defense Energy Information System

In support of OASD(P&L)'s responsibility to improve the effectiveness, reliability, and timeliness of energy information reporting, processing, and analysis, this project provides the information required to administer DoD's energy management responsibilities.

PL10 – ASD (Production and Logistics)

Title: Petroleum Quality Data System (PQDS)

This project consolidates the random patchwork of petroleum product quality assurance and surveillance databases throughout DoD into a comprehensive, reliable data system in support of energy preparedness.

PL11 – ASD (Production and Logistics)

Title: Logistics Planning

This project provides funds for nonprogrammed, high-priority logistics analysis in support of OASD(P&L) project officers, programmers, and analysts.

PL12 – ASD (Production and Logistics)

Title: International Logistics Support and Database/Analysis

This project continues the development of a database and information system on U.S.-origin equipment in foreign inventories, updating a previously developed NATO database and analytical software burden-sharing and infrastructure, which includes examination of weapon holdings, sustainability of air munitions, munition stockage position, firepower trends, and other logistic performance measurements in support of the OASD(P&L) mission to ensure provision of timely and sufficient wartime logistics support to and from allies.

PL13 – ASD (Production and Logistics)

Title: Defense Maintenance Information System

This project establishes and provides an interactive maintenance database query and management system that contains information concerning the reliability and maintainability of common components used within DoD, and cost and production data associated with organic and contract field- and depot-level maintenance, to enable logistics managers at all levels to retrieve and analyze timely and accurate maintenance data.

PL14 – ASD (Production and Logistics)

Title: Secondary Item Management Analysis/Database

This project develops models and ADP software for use with current OASD(P&L) office automation and microcomputer equipment, both as an independent process and as a remote terminal to gain access to selected databases in support of the DoD supply management function.

PL15 – ASD (Production and Logistics)

Title: Petroleum Disruption Response System (PDRS)

In support of the OASD(P&L) responsibility to advise the Administration, in a timely and substantive manner, on the criticality to DoD of the energy situation, interrelationships of options, and political, legal, market, and military readiness sensitivities of each option, this project informs key decision makers about the degree of an energy shortage, the time allowed for its resolution, and the optimal course of action available to DoD to deal with the emergency situation.

PL16 – ASD (Production and Logistics)

Title: Management Information System for Spare Parts and Automated Logistics Systems Modernization in the Defense Spares Initiatives Office (DSIO)

This project provides systems design, programming, and commercial databases not available in DoD data management systems, including extensive programming and ADP utilization support for the new Logistics Systems Modernization Division, and downloading of summary database data into the Metaphor database management system. It also acquires commercially-available databases, and supports the newly-acquired Defense Acquisition Regulation (DAR) Supplement 6 Breakout Program in support of spares management and the modernization of logistics management systems.

PL18 – ASD (Production and Logistics)

Title: POL Distribution Model

In support of energy preparedness, this project develops an automated method for analyzing periodic changes in fuel requirements, both by location and by quantity, evaluating the adequacy of host nation support and theater-assigned facilities, equipment, and personnel to support intra-theater distribution.

PL19 – ASD (Production and Logistics)

Title: Fuels Producibility

In support of energy preparedness, this project quantifies differences in the level of production and cost of military-versus-commercial-specification fuels under normal and disrupted market situations.

PL20 – ASD (Production and Logistics)

Title: Energy Information Analysis

In support of energy preparedness, this project provides access to Data Resources Incorporated (DRI) databases containing econometric energy models for coal, natural gas, and petroleum products; energy transportation models for ocean shipping, pipelines; and production, consumption, and energy cost data for all Free World and less developed countries where U.S. military forces are stationed.

PL21 – ASD (Production and Logistics)

Title: Boeing Computer/Copper Impact and COMPUSTAT Services

To help provide contracting officers with the necessary financial tools to negotiate contract prices, establish flexible progress payment rates, and perform financial analyses, this project provides for the cost of storage and annual rental of Standard and Poor's financial statement database to be stored and made available for the Financial Data Information System (FINANDIS) programs.

P22 – ASD (Production and Logistics)

Title: Automating Acquisition Regulations

In support of OASD(P&L)'s responsibility to coordinate revisions to the DAR and ease access to the regulations by the contracting community, this project automates the DoD acquisition regulatory system to make it more responsive to the needs of the systems' issuers and users by providing a historical tracking system, keyword search capabilities, public comments tracking, *Federal Register* tie-in, and video display terminal readouts at major DoD buying offices.

PL23 – ASD (Production and Logistics)

Title: Open Research Applied to Acquisition

This project funds technical and analytical ADP support for important acquisition issues that arise suddenly and demand immediate attention in support of requirements studies, system analyses, commercial time-sharing services, and other acquisition-related efforts.

PL24 – ASD (Production and Logistics)

Title: Logistics ADP Requirements

In support of the OASD(P&L) goal of achieving ADP logistics systems interoperability, this project provides contractor support for identifying the technical requirements and procedures that must be initiated to achieve systems interoperability.

PL25 – ASD (Production and Logistics)

Title: Defense Resources Model (DRM)

This project tests and modifies the DRM, which estimates the effects of force changes on DoD resources – was created by the Congressional Budget Office and converted by contractor – to develop the OASD(P&L) Resource Database, which aligns the FYDP resources according to traditional categories of force readiness, sustainability, and modernization to help decision makers estimate the balance between forces and their operational support. The project also estimates the effects of force changes.

PL26 – ASD (Production and Logistics)

Title: Integrated Logistics Support (ILS)

In support of the development if ILS planning, policy, and implementation guidance, this project establishes a logistics database with an interactive database management system, including reliability and maintainability data, ILS data, cost data, and schedule and equipment characteristics, and develops analytical tools that are compatible with the database and can be used to identify significant relationships among systems.

PL27 – ASD (Production and Logistics)

Title: Management Information System for Spare Parts Management (SPM)

This project eases SPM execution of assigned functions on the Defense Technology Information Center (DTIC) mainframe, establishing software linkages for INGRES DBMS to make the data files interactive and allow for storage and retrieval of large volumes of data.

PL28 – ASD (Production and Logistics)

Title: Contractor Identification Number Services

This project acquires contract replacement statistics that are researched and maintained by Dun & Bradstreet and recorded on magnetic tapes.

PL31 – ASD (Production and Logistics)

Title: Defense Industrial Network (DINET)

In support of the Office of Industrial Resources mission to develop and assess DoD-wide policies, procedures, and incentives to make sure that the U.S. industrial base is responsive to peacetime and national security requirements, this project collects, evaluates, and analyzes information from numerous sources to assess the capabilities of various U.S. industrial sectors, monitor foreign sourcing, and identify production constraints.

PL32 – ASD (Production and Logistics)

Title: Logistics Management Institute (LMI) Support

This project enables LMI to use 7CG computer resources in performing the data analysis portion of its OASD(P&L)-sponsored tasks.

PL33 – ASD (Production and Logistics)

Title: Decision Support

This project determines the needs of OASD(P&L) in decision support, surveys available decision support packages, and determines whether these packages have the required capabilities, including design, analysis, programming, and implementation when using the new office automation hardware and software for an OASD(P&L) Decision Support System.

PL34 – ASD (Production and Logistics)

Title: Utilizing AI in Logistics Management Systems

This project surveys artificial intelligence (AI) research in computer companies, commercial users, and weapon managers, identifies targets of opportunity for logistics, and proposes ways to take advantage of the technology.

PL35 – ASD (Production and Logistics)

Title: Industrial Productivity Computer Conferencing

This project funds annual access fees and monthly communications charges for participation in Defense Productivity/Quality Computer Network.

PL36 – ASD (Production and Logistics)

Title: Manufacturing Technology Program (MTP) Database

This project provides technical assistance during the programming phase of software development and production in writing reporting programs and instructions for creating a Service tape containing MTP data for entry into SIMON, testing

the system, preparing final documentation including a user's guide, conducting user training, and helping to transfer SIMON to the Defense gateway computer system.

PL37 – ASD (Production and Logistics)

Title: ADP Interoperability

This project evaluates the feasibility of having various technical bridges, such as intelligent gateways, interface heterogeneous equipment and software.

PL38 – ASD (Production and Logistics)

Title: Weapon System Readiness and Support Analysis

This project models and simulates system performance and evaluates relationships and sensitivities among weapon system hardware test equipment and support structures, using the 7CG System C and employing data acquisition support from the Air Force logistics database at Wright-Patterson Air Force Base, the Army's Operational Test and Evaluation Agency's data systems, and some Navy databases.

PL39 – ASD (Production and Logistics)

Title: Office Automation Hardware

This project funds the purchase of OA hardware.

PL40 – ASD (Production and Logistics)

Title: Procurement Gateway System

This project funds an OA gateway system.

PO01 – USD (Policy)

Title: Policy Secure Office Automation LAN

The project provides automation capabilities to staff through a classified network architecture employing coaxial cable, fiber optic cable, and encryption devices and provides electronic connectivity of all Policy offices, both within and external to Policy, with word processing, graphics, database support, cable receipt and distribution, spreadsheet, administrative support, document storage and retrieval, and correspondence and suspense control tracking capabilities. These are in support of the USD(P) responsibility to assist the Secretary of Defense in matters concerning the integration of DoD plans and policies with overall national security objectives and in policy matters concerned with NATO affairs.

PO02 – USD (Policy)

Title: Map/Graphics Support

This project provides for retrieval, archiving, and distribution of maps and manipulation of data stored on those maps in support of OUSD(P) requirement to prepare information documents, forecast plans, and write position papers, specifically in foreign policy and security assistance.

PO03 – USD (Policy)

Title: Crisis Coordination Center

This project will award a competitive bid contract in support of the Crises Control Group (CCG) requirement for a sensitive, compartmented information facility (SCIF) with an automated system that will provide for administration, correspondence control, and decision support for the Crisis Management System and electronic internetting with DoD and non-DoD networks.

PO04 – USD (Policy)

Title: Defense Emergency Authorities Retrieval and Analysis System

This project supports legal aspects of DoD mobilization, crisis management, and continuity of operations.

PO05 – USD (Policy)

Title: Security Assistance Database

This project provides funds to assist the Office of the Assistant Secretary of Defense (International Security Affairs) [OASD(ISA)] in tracking international transfer payments.

PS01 – WHS (Directorate for Personnel and Security)

Title: Air Force Support Reimbursement

This projects funds the Air Force civilian personnel data system to replace the Army civilian personnel data system in support of P&S civilian personnel management. The system supports all personnel processing, management information system requirements, and responses to data requests from OMB, the Office of Personnel Management, and Congress.

PS02 – WHS (Directorate for Personnel and Security)

Title: Equipment Upgrade and Expansion

This project allows for the acquisition and upgrade of terminals to permit optimum use of software capabilities to provide the Directorate for P&S, support activities, management, OMB, OPM, and Congress with a positive response to data

requests, the full realm of personnel processing, and the performance of management information systems requirement functions.

PS04 – WHS (Directorate for Personnel and Security)

Title: Job Vacancy Information System

This project provides Pentagon employees, other Government employees, and visitors one-stop access and information to vacancies that are serviced by Defense personnel offices located in the Pentagon.

PS05 – WHS (Directorate for Personnel and Security)

Title: Xerox and Metaphor Equipment Maintenance

This project provides maintenance support for both the Xerox and Metaphor equipment in support of P&S.

RA01 – ASD (Reserve Affairs)

Title: Workstation Complement

In reaction to the findings of a survey into requirements definition, conducted in November 1984, February 1986, and March 1986, this project provides planning, system acquisition, installation, and both training for and operational evaluation of workstations.

RA02 – ASD (Reserve Affairs)

Title: Software – Miscellaneous Hardware Upgrade

This policy provides newly released software, updated software, upgrade minor hardware, and replacement hardware for various workstations in support of the ASD(RA) responsibility for requirements definition, planning, acquisition, installation, training, and operational evaluation within OASD(RA) as well as for the Reserve Forces Policy Board.

RA04 – ASD (Reserve Affairs)

Title: Network Connectivity

This project connects the Reserve Affairs network with networks of other OSD organizations: OASD(C)'s Ethernet and DCOAR's Datapoint Arcnet.

RA05 – ASD (Reserve Affairs)

Title: Graphics Software, Hardware, and Support

This project funds hardware, software, and analyst support in microcomputer graphics.

RA06 – ASD (Reserve Affairs)

Title: Microcomputer – Mainframe Link

This project provides planning, system acquisition, installation, training, and operational evaluation of International Business Machines (IBM) PC-based microcomputer linkage to mainframe devices.

RA08 – ASD (Reserve Affairs)

Title: TEMPEST Equipment Upgrade

This project provides a TEMPEST-certified plotter and upgrades hardware for three IBM PC-based TEMPEST microcomputers and four NGEN-based TEMPEST microcomputers.

RA10 – ASD (Reserve Affairs)

Title: Microcomputer Hardware Maintenance

This project funds contract maintenance support of OASD(RA)'s hardware.

RA11 – ASD (Reserve Affairs)

Title: Executive Decision Support Center (EDSC)

This project establishes an EDSC facility that supports retention of mobilization information within a central coordinating facility in times of crisis. It will provide a capability for coordinating mobilization exercises and conducting readiness briefings, and will function as a drilling site for Reserve members who will be assigned to this crisis center during active duty.

RA12 – ASD (Reserve Affairs)

Title: Information Security

This project conducts an analysis of the security of information resources, develops procedures, and acquires software and hardware devices that will ensure the integrity of Reserve Affairs' information system.

RA14 – ASD (Reserve Affairs)

Title: Data Communications Services

This project provides access to commercial information services, including *Congressional Quarterly* and International Telephone and Telegraph Dialcom.

RA15 – ASD (Reserve Affairs)

Title: Application Support

This project designs, executes, and maintains various microcomputer-based software applications, consisting of databases, reports, and graphics derived from existing data sources in support of routine internal Reserve Affairs management and for input to OSD, JCS, and Congress.

RA16 – ASD (Reserve Affairs)

Title: System Support

This project funds system-level support of the NGEN-based microcomputers and software utilized by Reserve Affairs, including configuration design, interface software development, and operational evaluation of the network.

RA17 – ASD (Reserve Affairs)

Title: Facilities Maintenance

This projects funds contractor assistance in maintaining Reserve Affairs hardware inventory, configuration control, equipment installation and de-installation, workstation configuration manuals, user guides, and microcomputer operations plan.

RE01 – Director, Defense Research and Engineering

Title: Program Budget System

This project funds purchase of budget system, database management programs, peripherals, lease of support systems and software; contract to provide systems time-sharing for DTIC, Defense Data Network (DDN), and on-call econometric analysis systems; services associated with Congressional Justification Books, Export Control Database, operations, maintenance, and data entry support function; systems analysis in support of expanded office automation requirements linked to management of management information systems reports; customized formats, data summarization, and graphic displays; contracts to provide automated distribution of case processing; studies to determine the alternatives to satisfy the security restrictions and evaluate those alternatives with respect to system costs, procurement cycle, technical features, and user training; and services associated with the preparation and maintenance of the RDT&E and Procurement data for defense weapons systems, the management of related FYDP systems.

RE02 – Director, Defense Research and Engineering

Title: SURVIAC, Booz-Allen

This project is responsible for data analysis, decision support, software development, and production of hardware and software needed to speed the

development and implementation of computer-driven rear screen technology of high-resolution graphic displays.

RE03 – Director, Defense Research and Engineering

Title: MULTICS Replacement/Software

This project provides for systems technology to improve future compatibility to ease incorporating open architecture, e.g., integration with other systems.

RE04 – Director, Defense Research and Engineering

Title: Secure LAN

This project provides intra- and inter-component communication, remote communications, executive and managerial decision support systems, database management, imaging and graphics, computer-assisted instruction, and word processing.

RE05 – Director, Defense Research and Engineering

Title: RFI Shielded Facility/Management Control Facility

RE06 – Director, Defense Research and Engineering

Title: Defense Communication Teleconference Network (DCTN)

RE07 – Director, Defense Research and Engineering

Title: Decision Support Center

This project improves the decision-making process with its attendant benefits of data access, timeliness and accuracy for the Secretary of Defense, OMB, and Congress for the preparation, production, preview, and automation of audiovisual information for special access and compartmented programs in coordination with the OUSD(P) and the OASD(C3I).

SM01 – WHS (Directorate for Real Estate and Facilities)

Title: Unclassified Administrative Tracking/Information Systems

This project provides for an aggregate of 30 programs running on the OSD DATAPOINT ARC Network.

SM02 – WHS (Directorate for Real Estate and Facilities)

Title: Computer Aided Design (CAD) Engineering System

This project provides complete digitalization of the Pentagon floor plan as the initial database, including construction information, physical features (load-bearing walls, other structural data), electrical, cable, telephone, and other wiring

information, with changes and additions based on such factors as configurations and occupant changes.

SM03 – WHS (Directorate for Real Estate and Facilities)

Title: Security Systems (Metaphor)

This project provides a secure, automated information system with 50 to 75 workstations to replace the Datapoint Arcnet system, in support of Pentagon police force in office automation (electronic mail, word processing, calendar management, etc.) and database applications (citations issued, training records, threats received, automated access, etc.).

SM04 – WHS (Directorate for Real Estate and Facilities)

Title: Graphics Design System

This project provides full-color computer graphics to augment in-house capability and efficiency in producing high-resolution color end products, viewgraphs, 35-mm slides, film, and other graphic art products.

TE01 – Office of Test and Evaluation

Title: Secure Office Automation Network

This project monitors and reports operational test and evaluation issues with respect to the major Defense acquisition program, reports on the OT&E program in an annual report, and answers questions from Congress and others.

APPENDIX F

HOW TO PREPARE PROJECT REQUESTS AND DOCUMENTATION FOR AUTOMATED INFORMATION SYSTEMS

1.1 INTRODUCTION.

This appendix provides guidelines for preparing project requests and supporting documentation for OSD's Automated Information Systems (AISs).¹ Standardized documentation serves several purposes:

- Provide managers with documents to review at significant developmental milestones to determine whether requirements have been met and expenditures of resources should continue.
- Record technical information.
- Make sure that authors of documents and managers of project development have a guide to follow in preparing and checking documentation.
- Provide uniformity of format and content of AIS documentation.²

The purpose of this guide is to be sure that AIS project requests submitted by OSD components comply with Federal and DoD acquisition directives; contain the data needed to support planning, programming, budgeting for, and acquiring the system; and provide a structure that supports more detailed descriptions of system functions in the later stages of system development. This document (1) specifies the activities to follow in determining requirements for a new AIS, (2) describes the OSD project request and the supporting documentation required for each type of AIS request, and (3) identifies the management levels at which AIS projects are approved.

¹DoD Directive 7920.1, *Major Automated Information Systems Approval Process*, defines an AIS as a collection of functional user and ADP personnel, procedures, and equipment (including ADPE), which is designed and built, operated, and maintained to collect, process, store, retrieve, and display information. "AIS" is used interchangeably with "automated data system (ADS)" and "information technology (IT) system" in Federal directives that refer to use of automated data processing equipment to support information management.

²DoD Standard 7935, (DoD-STD-7935), *Automatic Data Systems (ADS) Documentation*

1.2 DETERMINATION OF REQUIREMENTS.

This is the sequence of activities to follow when calculating requirements for an AIS:

1. *Identify a Mission Need.* Analyze the mission to identify goals, mission functions, and all the information requirements that must be satisfied to perform the mission. A mission need results from a deficiency in information support to a mission, a new or changed mission requirement, or an opportunity to increase efficiency or effectiveness in processing information.

2. *Establish System Goals and Objectives.* State major performance requirements and system goals. Relate them to mission objectives or functions.

3. *Perform a Feasibility or Concept Exploration Study.* Perform enough analysis to determine the probable characteristics, costs, and benefits of information technology that will meet system performance requirements and support system goals. Consider alternative concepts that would meet system goals. The study should be detailed enough to support a management decision to commit or deny resources for more detailed analysis.

4. *Develop a Functional Description.* The scope and format of a Functional Description (FD) are prescribed in DoD-STD-7935. These are some essential tasks in preparing an FD:

- Describe current methods and procedures. Include organizational responsibilities, equipment, inputs and outputs (including volume and frequency), and deficiencies. Chart the flow of data.
- Tell in nontechnical terms how the proposed system will satisfy the information requirements. Discuss capabilities that are planned and capabilities that will be eliminated or reduced by the new system.
- Provide information about the uses and purposes of the system. Refer to higher-order and parallel systems, and the relationship between the project and other capabilities being developed concurrently.
- Prepare a quantitative and qualitative summary of the benefits to be obtained from the proposed system. Point out explicitly which required capabilities will be provided and describe the extent of anticipated improvements.
- Describe user assumptions and constraints that affect development of the system.

5. *Develop Alternatives to Meet Goals and Objectives.* Identify hardware and software packages that satisfy system requirements.

6. *Perform an Economic Analysis (EA) of the Alternatives.* Identify evaluation criteria. Then, compare the costs and benefits of the alternatives systematically and identify those yielding the greatest benefits for a given level of cost or the lowest cost for a given level of capability. (This activity can be part of the concept exploration for a complex, costly AIS.)

7. *Choose an Alternative.*

8. *Develop System Technical Specifications for the Chosen Alternative or Alternatives.* Develop detailed specifications for each input and output, and define all data elements and files.

9. *Devise an Acquisition Strategy.* Choose a management approach, level of effort, and schedules for implementing the system.

1.3 CATEGORIES OF AIS PROJECTS.

The content and the level of detail in the project request vary with the cost, complexity, and stage of development of the proposed AIS. There are five categories of AIS projects:

- Major System projects
- Major AIS System projects
- Level 1 projects with life-cycle costs above \$1,000,000
- Level 2 projects with life-cycle costs between \$50,000 and \$1,000,000
- Level 3 projects with life-cycle costs under \$50,000.

1.4 PROJECT DOCUMENTATION.

1.4.1 The Project Request and Review Process.

AIS projects that meet the DoDD 5000.1 criteria for designation as Major Systems are documented by a Joint Major System New Start (JMSNS) and a System Concept Paper (SCP), prepared and processed through the Defense Systems Acquisition Review Council (DSARC) in accordance with DoDD 5000.2. A Major System is normally a separate line item in the Defense budget. A major AIS project that does not meet the DoDD 5000.1 criteria but is designated a major AIS is documented by a JMSNS and by a System Decision Paper (SDP) that is prepared in accordance with DoDD 7940.2. A DD Form 43C narrative summary and Form 43A resource summary are also submitted for each Major AIS. Major AISs are reviewed and approved by the Major Automated Information Systems Acquisition Review

Council (MAISARC). Major Systems and major AISs are not processed through DCOAR and are therefore not discussed in further detail here.

Level 1, 2, and 3 projects are documented by the DD Form 43C narrative system summary and the DD Form 43A resources requirement summary. Every project requires a functional description commensurate with the cost and level of complexity of the system. DoD-STD-7935 provides guidance for assigning a complexity rating to AIS projects (Section 3.1.1). Every Level 1 and 2 project require an economic analysis, as described in Section 1.4.3. A Level 3 project requires a comparative cost analysis (CCA), which "may be limited to an analysis that demonstrates that the benefits of acquiring the proposed system will outweigh the costs" [Federal Information Resources Management Regulation (FIRMR), Part 201-30.009-1]. The FD and EA for Level 1 and 2 projects should be prepared by components, with technical assistance from the Directorate for Computer and Office Automation Resources (DCOAR), as required. They are reviewed by DCOAR before funds are allocated. Table F-1 shows the documentation required and the review process for each type of system.

TABLE F-1
DOCUMENTATION AND REVIEW OF AIS PROJECTS

Type of system	Review and life-cycle costs	Approval	Documentation
Major system	Over \$1,000,000,000	DSARC	JMSNS, SCP
Major AIS	Over \$100,000,000	MAISARC	JMSNS, SDP
Level 1 project	Over \$1,000,000	DCOAR	43C, 43A, EA
Level 2 project	\$100,000 – \$1,000,000	DCOAR	43C, 43A, EA
Level 3 project	Less than \$50,000	Component	43C, 43A, CCA

Form 43C is a top-level summary document, with sections that describe the scope, milestones, purpose, and benefits of an AIS. The type of requirement activity determines the number of sections of the 43C that must be completed in the project request. Table F-2 shows which sections of the 43C must be completed for specific requirements.

TABLE F-2

DOCUMENTATION REQUIRED FOR LEVEL 1, 2, AND 3 PROJECT REQUESTS

Requirement activity	DD Form 43C sections completed	Form 43A	Economic analysis
Feasibility study	I, II, III	Yes	No
Concept development study	I, II, III	Yes	No
Economic analysis	I, II, III	Yes	No
Comparative cost analysis	I, II, III	Yes	No
Functional description	I, II, III	Yes	Level 1 projects Level 2 projects
System design/development	All	Yes	Yes
Equipment procurement	All	Yes	Yes

The level of detail in Forms 43A and 43C depends on the activity being conducted. When a feasibility study is requested, few data about the proposed AIS are available. When an equipment procurement is requested, a functional description and system specifications that meet the requirement of DoD 7935.1 should have already been prepared and summarized on Form 43C. For Level 1 and Level 2 equipment requests, a copy of the FD, system specifications, and EA should be attached when a procurement request is sent to DCOAR.

1.4.2 Functional Description.

The FD describes in detail the requirements that a proposed system will satisfy. There is no standard format for a requirements analysis, FDs or other system documents but the requirements analysis must result in an FD and accompanying documents that provide the information required by DoD-STD-7935. DCOAR can provide assistance in conducting requirements analyses.

1.4.3 Economic Analysis.

Typically, a number of alternative systems or configurations are capable of accomplishing AIS objectives. EA is designed to compare the costs and benefits of the alternatives systematically and to pick out the ones that yield the greatest benefit for a given level of cost or the lowest cost for a given level of benefit. The

level of detail addressed in the EA should correspond to the system cost and the number of alternatives available for consideration.

There are two types of EAs. EAs with the status quo as one of the alternatives are referred to as Type I analyses. For some routine information-processing activities, the current mode of operation may be delivering the required capabilities but it may be thought that a new system would increase efficiency and offer other benefits. In this case, continuing with the current system should be listed as an alternative. Cost-benefit measures, such as payback period (the number of years that it takes to recover initial investment costs through savings attributable to lower annual costs for the new system), savings-to-investment ratio, and internal rate of return, may apply in a Type I analysis.

An EA that is confined to new systems because the analysis concerns a new mission or the existing system cannot deliver required capabilities is referred to as a Type II analysis. Type II analyses focus on the relative cost-benefits of the alternatives. The above-mentioned measures of cost-benefits do not apply in Type II analyses.

The EA process is defined in eight steps, which constitute the outline for the EA report:

- Describe the organizational mission function(s) to be supported.
- State the AIS objectives and identify the capabilities required to achieve the objectives.
- List all the assumptions that underlie the EA.
- Define the alternatives to be considered.
- Determine the costs of each alternative.
- Determine the benefits of each alternative.
- Compare the alternatives.
- Perform sensitivity analyses of critical assumptions and uncertainties.

Each of these steps is discussed below.

Mission Functions Supported. The brief description of organization and mission functions documents the linkage between the mission functions supported and the information-processing capabilities required.

Objectives and Capability Requirements. The most important step in the EA process is defining the objective. This is a simple and concise statement of what is to be accomplished in the project, along with a list of the capabilities needed for accomplishment. If the objective is to provide compatible office automation capabilities throughout a component, for example, the specific capabilities needed may include specifications for information access and storage, response times, graphics display and printing capabilities, security requirements, and other capabilities. A statement of required capabilities should not be too specific, or the list of feasible system alternatives will be severely limited and the benefits to be derived from this type of competition will not be realized.

Assumptions. Every EA is based on critical assumptions that could affect the results of the analysis if they were not valid. The availability of related system capabilities or funds for facilities or other projects that are needed for successful operation of the proposed system may be questionable. Moreover, the economic life used in cost calculations, the projected future workload and other critical values that are uncertain or arguable should be stipulated. It is important to state clearly the assumptions used in the analysis so that the decision maker is fully aware of the basis for the evaluation and the risks associated with the choice of a specific alternative.

Alternatives. All reasonable alternatives capable of delivering the required capabilities should be evaluated. This can prove to be a challenging task, especially in the AIS world, where rapidly changing technology continues to provide a plethora of new products and capabilities. These alternatives should span the worlds of microcomputers, minicomputers and mainframe computers, if appropriate, and include such possibilities as buying or leasing equipment or sharing resources with other organizations.

Costs. In an EA, the cost measured by the relevant life-cycle cost (LCC) of each alternative. LCC includes the costs of developing, buying and operating the AIS over its economic life. The economic life of an AIS is usually the shortest of: the life

of the AIS mission or task, the physical life of every major system component, or the projected time at which the system becomes technologically obsolete. The fast rate of technological progress in information processing dictates that the operational economic life of AISs used in EAs not be set too high. For smaller systems, such as personal computers (PCs) and some minicomputers and microcomputers and printing equipment, the economic life may be as short as 2 or 3 years. For larger mainframe systems, the assumed economic life may be 5 to 10 years or longer.

An EA should include only those costs which differ among the set of AIS alternatives evaluated. Costs that have already been spent or are irrevocably committed to a project are referred to as sunk costs. Sunk costs cannot be changed as a result of an EA and should not, therefore, be included in LCC for the system alternatives.

In EAs, it is of critical importance that the costing procedures used be consistent across the alternatives evaluated. Consistency is needed in all areas, including the cost element list, treatment of inflation, data sources, salary and wage rates, and AIS functions performed. In many cases, consistency has been shown to be even more important than completeness or accuracy in the development of LCC estimates for an EA.

The major EA cost elements are:

- Nonrecurring costs of research and development (R&D) and investment
 - ▶ Costs of developing, testing, and evaluating new technology
 - ▶ One-time costs incurred while initiating operations (purchase or modification of land, equipment, facilities, software, system development including development of functional requirements, design, analysis, programming, testing, conversion, and relocation).
- Recurring, annual cost for the operation and support (O&S) of AISs
 - ▶ Personnel, including fringe benefits and overhead
 - ▶ Supplies, contracted services, leased equipment, software, equipment maintenance, space occupancy, and inter- and intra-agency services.

Cost Measure. A simplified measure of the LCC of alternatives may be used. This is simply the sum of nonrecurring investment costs, and the product of a factor and annual O&S costs stated in constant, inflation-adjusted dollars. The simplified

procedure assumes that all nonrecurring costs are incurred at the beginning of the planning period and that annual recurring costs are incurred in equal amounts over the assumed economic life of assets. The factor is based on use of the prescribed 10 percent discount rate applied to costs incurred evenly over the economic life of systems (FIRMR Part 21-24.208). A sample of a simplified EA is included in the Attachment. DoD Instruction 7041.3, Economic Analysis and Program Evaluation for Resource Management, contains additional guidance for measuring costs. It also contains a discount factor table (Attachment 4 to Enclosure 2).

Four basic methods for estimating costs are: the engineering estimate, parametric cost-estimating relationship, analogy, and expert opinion. No fixed set of rules or data sources can be specified. The method chosen will depend on the phase of AIS development and the availability of detailed system description and cost data. For typical systems, some combination of the engineering and analogy methods are preferred. The engineering approach is a detailed estimate, based on separating the system into a number of subelements that are amenable to quantification through use of work standards, historical data for similar items, or engineering simulation. Cost estimates can sometimes be made by extrapolation from the known costs of a similar or closely related analogous system. Parametric estimates are based on the known costs of a group of systems in a family. A relationship between costs and system characteristics is developed generally using statistical regression techniques.

AIS systems are subject to a high rate of technological advance. Cost estimates based on experience with older systems may not be valid unless they are carefully adjusted to account for effects of advanced features of new technology. In such cases, expert opinion may be needed.

Benefits. Benefits are the outputs to be expected from an AIS system. Though it is important to list all benefits and to quantify some where possible, it is sometimes not possible to define equal-benefit system alternatives, and the rationale for choosing an alternative may rest more heavily on relative benefit considerations than on costs.

Categories of system benefits include the measures of output listed below, followed by an example in parentheses. The benefit areas are:

- Production (number of records processed)
- Productivity (records processed per staff-hour)
- Operating efficiency (copies per kilowatt-hour)
- Reliability (failure rates)
- Accuracy (error rate)
- Maintainability and integratability
- Availability (delivery dates, responsiveness)
- Service life
- Quality
- Acceptability
- Ecology
- Economy
- Morale
- Safety
- Security.

The benefit categories listed above should be viewed as a checklist of possibilities for inclusion in an EA. In many EAs, from one to three benefit areas are of critical importance to the specific mission. For some applications, a predominant concern may be security; for others, accuracy or operating efficiency may be critical. The critical benefit areas should be highlighted in the EA and made especially visible to the decision-maker.

Comparisons. If the EA is to be the sole basis for recommending an alternative, the alternatives must be equal in either benefits or costs. Among equal-benefit alternatives, the least-cost alternative is preferred; conversely, the alternative with the greatest benefits is preferred if the alternatives are equal in cost. If neither costs nor benefits are equal, the role of the EA is not to serve as a basis for a recommended solution, but rather to surface all the comparative cost and benefit information so

that the decision maker can decide intelligently on the value of higher benefit levels while imputing priorities to other projects that are competing for the same funds. In this case, the EA can also be used to identify and rule out illogical alternatives, namely, those that are both higher in cost and lower in benefits than the other alternatives under consideration.

Sensitivity Analysis. All EAs are based on assumptions concerning such factors as the projected workloads for AISs, economic life of systems, and legislative requirements. Moreover, parameter estimates are subject to various degrees of uncertainty.

The procedure for testing the sensitivity of the EA is to vary the values of uncertain parameters or assumptions over the range of reasonable values that each may assume, one variable or assumption at a time, while all other inputs are held constant. Results of the analysis are then recalculated. If the ranking of alternatives changes as a result of these variations, we may conclude that the result of the analysis depends on selected assumptions and uncertain estimated values. The results of the sensitivity analysis – so that the risks and uncertainties implicit in each alternative are known – can then be reported to the decision maker.

In AISs, it often happens that some systems have more expansion potential than others. At higher assumed workloads, systems that are easily expanded may be preferred over less expensive system that cannot be modified easily. Sensitivity analysis, a convenient mechanism for highlighting this type of information, can be included systematically in the decision-making process.

1.4.4 Procurement Request.

After funds are approved for an AIS, the SD 419 is prepared by the sponsoring OSD component and processed through DCOAR. The following information is requested on SD Form 419:

- *Project Title* – The name of the AIS as it was recorded on Form 43C.
- *Estimated Cost* – The project costs as recorded on Form 43A.
- *Appropriation and Accounting Classification* – Provided by Washington Headquarters Services (WHS) Budget and Finance, and based on the approved AIS project.

- *Statement of Work* – A description of services and equipment required in more detail than is recorded on Form 43C.
- *Recommended Sources* – Recommended sources of supply or, if there is only one acceptable source, a *Justification for Other Than Full and Open Competition*.

For Levels 1 and 2 AISs, an EA, FD, system specification, and other documentation required by DoD-STD-7935 must accompany SD Form 419 and be reviewed for technical adequacy by DCOAR. After review, DCOAR processes the SD 419 and returns the other documentation to the sponsoring component. If requirements have been properly documented through each stage of the requirements determination process, the AIS or services procured through the SD 419 should meet the system objectives determined at the outset.

APPENDIX F: ATTACHMENT 1
A SIMPLIFIED EXAMPLE OF ECONOMIC ANALYSIS
LEVEL 2 ECONOMIC ANALYSIS

1. INTRODUCTION.

This is an example of a Level 2 economic analysis (EA). Level 2 applies to projects with potential procurement costs under \$1,000,000.

2. ECONOMIC ANALYSIS.

The manpower analysis staff now consists of 144 professionals, all with college degrees. Their pay grades range from GS-9 to GS-14. In the past 5 years, half of the staff has been equipped with PCs and supporting software for word processing, database management, and spreadsheet and statistical applications. The increase in quality and quantity of analytical products resulting from this investment has been substantial. Despite increases in demand for reports to Congress, no increase in staff has been needed, and reports of better quality are now produced on schedule.

The simplified EA is presented here in eight steps:

1. *Organizational Mission Functions.* The manpower office is routinely engaged in analysis of Defense manpower requirements and is responsible for producing several annual reports on manpower requirements for OSD and Congress. These reports are based on analyses of several large Service and OSD databases, which are available on mainframe systems.

2. *Objectives and Capability Requirements.* The objective is to provide 72 professional staff members with computer support for database analysis and report writing. Capabilities are needed for creating special-purpose reports and extracting and reformatting standard reports. General-purpose graphics and printing for automated production of written reports are also required.

3. *Assumptions.* This EA assumes that the Congressionally generated workload will continue to increase over time, with the known addition of two new reports, and that the present manpower authorization for this office will not change. The economic life of the system alternatives examined is assumed to be 5 years.

4. *Alternatives.* Alternative A is to equip 72 analysts with the 80826 Processor and 40 megabyte hard and high-density floppy disk drives. Alternative B is to equip

14 stations with systems based on the 80386 Processor, each with 130 megabyte hard drives. For each station, five or six users would access one of 14 local area networks through user terminals. Alternative C is a small dedicated mainframe (for example, one of the VAX or micro-VAX family) to serve the needs of all 72 staff members. An alternative involving interagency agreements to access each other's mainframes was ruled out. It has been tried and found lacking in the responsiveness needed, partly because of reliability problems and partly because of user priorities that conflict with the needs of the manpower office.

5. *Costs.* Estimated costs for the three alternatives are shown below:

COSTS FOR ADP SYSTEM ALTERNATIVES

(Thousands of constant FY87 dollars)

	Alternative A: 80826 systems	Alternative B: 80386 systems	Alternative C: micro/mainframe
Nonrecurring			
Procurement			
PCs	\$144	\$70	\$125
Terminals		36	36
Software	72	50	50
Training	36	72	108
Total nonrecurring	\$252	\$228	\$319
Recurring			
Annual cost			
Maintenance	\$7	\$5	\$6
Space rental			4
Mainframe operations			36
Total recurring	\$7	\$5	\$46

Other than annual costs for micro/mainframe operations, personnel costs are not affected by the addition of this equipment and have been excluded from the analysis.

Under the simplifying assumption that all nonrecurring costs are incurred at the beginning of the operational life of the systems and that all annual costs are incurred evenly over 5 years, LCC discounted at the Office of Management and Budget (OMB)-prescribed 10 percent rate are equal to nonrecurring costs plus 3.977 times annual costs. These, then, are the LCC of the alternatives:

Alternative A: \$280,000

Alternative B: \$248,000

Alternative C: \$507,000

6. *Benefits.* Alternative A offers the most in distributed information technology. Computational power is available on demand by every user, without queuing problems, at reasonably fast processing speeds.

Alternative B is based on use of the 80386 processor, which yields processing speeds about twice those of Alternative A. This results in a 20 percent reduction in the staff-hours needed for processing. The larger hard disk would permit the processing of larger file sizes than in Alternative A, if used with an advanced disk operating system (DOS) or other operating system. Networking with five or six stations would result in queuing problems only 2 percent of the time, and sharing unused workstations could solve that problem.

Alternative C offers the most in terms of processing power, speed, and ability to handle large file sizes. The risks associated with this alternative are that single users can cause queuing problems for an entire office that has large processing demands. Moreover, computer downtime at the one central processor immobilizes the information technology work effort until the system is repaired.

7. *Comparison.* The least-cost alternative is Alternative B. It offers a combination of higher processing speed and staff-hour savings and can process larger file sizes than Alternative A at a lower cost. Alternative B is preferred over Alternative A for those reasons. Potential queuing and downtime problems associated with Alternative B can be handled by sharing unused capacity in one of the 14 CPUs in the system.

Alternative C costs are more than twice those of Alternative B. Alternative C runs the substantial risk of downtime because of reliability problems in the one central processing unit (CPU) in the system. Alternative C is capable of processing larger file sizes at faster speeds than Alternative B. An analysis of workload pattern in the manpower office has shown that this capability is needed 2 weeks a year. The present approach is to purchase services through a contract.

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PLANNING FOR INFORMATION RESOURCE MANAGEMENT BY OSD(U)
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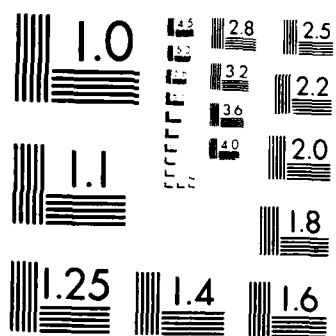
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agreement at a cost of \$10,000 a year. Even if \$50,000 (\$39,770 when discounted) is added to the cost of Alternative B, it remains significantly less expensive than Alternative C.

Alternative B is the preferred alternative based on this EA.

8. *Sensitivity Analysis.* Alternative B has the lowest LCC for any assumed economic life because both its nonrecurring and recurring costs are lower than those of the alternatives. Doubling the assumed workload would tip the scales in favor of Alternative C, since neither of the alternatives could be expanded to handle the increase. The manpower authorization for this office would also have to increase. But no such large increase in workload is expected.

APPENDIX G

COMPUTER-AIDED ACQUISITION AND LOGISTIC SUPPORT

1.1 PURPOSE.

The purpose of this appendix is to summarize DoD's Computer-Aided Acquisition and Logistics Support (CALS) as described in a June 1987 Report to the Committee on Appropriations of the United States House of Representatives by the Office of the Assistant Secretary of Defense (Production and Logistics).

2 PROGRAM SUMMARY.

The report describes CALS as follows:

The DoD CALS program is a strategy designed to institute within the Department and its industrial support structure an integrated "system of systems" that can create, transmit, and use technical information in digital form to design, manufacture, and support Defense weapon systems and equipment. This concept applies rapidly advancing communications and computer technology to the acquisition and logistic support of major weapon systems and information systems developed by the Defense industry for DoD.

The information that follows was also taken from the report referenced above.

According to the report, CALS will be implemented in two overlapping phases. Phase I focuses on exploiting current and near-term technology to enhance the information processes that support the highest-impact acquisition and logistic functions. The high-impact information includes:

- Engineering drawings and other information used to support competitive spares procurement
- Technical manuals and other information used to support weapon system maintenance
- Logistics Support Analysis Records (LSARs) and other information used to plan logistic support
- Life-cycle configuration management of weapon system technical information

- Creating automated interfaces among reliability and maintainability data, logistic system engineering, and computer-aided design.

Phase II is targeted at new functional capabilities through redesign, integration, and consolidation of the many parallel, duplicative processes that presently support acquisition and logistics in DoD. Phase II will:

- Provide integrated product databases or models owned by DoD that will include all the information needed for design, manufacture, and support of weapon systems
- Make the databases accessible to a variety of industry and DoD users through electronic means.

1.3 INTERFACE STANDARDS.

The interface standards being developed for Phase I should permit digital data interchange in neutral format within and among DoD components and between DoD and industry. Standards development is a challenge because CALS needs common conventions for exchanging both graphic and text data and will support multiple users using different equipment in different geographical locations. DoD must implement the electronic information interchange standards needed to interconnect the various databases, applications programs, and communications systems used by DoD and industry in Defense acquisition and support.

CALS is to embrace private sector standards wherever possible since many CALS users will be industry representatives and since some of the Phase II databases will be possessed and maintained by contractors. The National Bureau of Standards (NBS) and the Logistics Management Institute are helping DoD develop standards for CALS. The following progress has been made in development of CALS standards:

- Military Standard 1840, "Automated Exchange of Technical Information" was published in September 1986
- NBS developed the initial set of data exchange requirements, now called CALS Phase I core requirements. This requirements package, released for coordination in April 1987, includes standards for digital exchange of the following information:
 - ▶ Product definition (engineering drawings)
 - ▶ Text and graphics for technical manuals

- ▶ LSARs
- ▶ Related functional requirements which can be included in weapon system Request for Proposals and contracts.
- A CALS telecommunications plan¹ was released for coordination in June 1987. It included a draft telecommunications architecture and an intelligent gateway architecture, which consisted of guidelines for transmitting data over long-haul lines, recommendations for making optimum use of the Defense Data Network (DDN), and alternate means for data transmittal.
- A June 1987 LMI report² assessed the ability of DoD and industry networks to meet CALS telecommunications requirements.

CALS program managers plan to gradually implement already-identified data standards by including the standards in future electronic technical data procurements in weapons programs now in the development phase, and by selectively retrofitting the standards into recently-acquired Service automated technical data repositories and publishing systems. Defense contractors are working with DoD and NBS to establish near-term CALS capabilities as quickly as possible. NBS, with DoD CALS research and development support, continues its substantial effort to develop standards and verify CALS approaches.

Despite the existence of protocol standards, it will be some time before there is a consistent, easy access to the multiple sources containing CALS data. To support users, intelligent gateways (IGs) are needed to facilitate retrieval and analysis of CALS data from dissimilar hardware and software. The telecommunications plan calls for communication protocols, data exchange protocols, transmission media, and IGs used in support of CALS projects to be implemented in three phases as part of a phased DoD migration to Open Systems Interconnection (OSI) standards. The three phases and their activities are as follows:

- *Phase 1 – Near Term (1987 – 88).* Special attention is given to the local environment. The bulk of data transfer over geographically disbursed areas will generally be accomplished off-line. Connectivity to DDN will be limited to high-priority, low-bandwidth transmissions. A gateway

¹Draft LMI Report AL636R2. *Computer Aided Logistic Support Telecommunications Plan.* DeLaura, Frances L., Sandra Heiler, and Steven J. Sharp, June 1987.

²LMI Report AL636R1. *Assessment of DoD and Industry Networks for Computer Aided Logistics Support (CALS) Telecommunications.* DeLaura, Frances L., Steven J. Sharp, and Richard Clark. June 1987.

intermediate system should be used to support interoperability requirements with activities that have implemented the DDN protocol suite or a proprietary set of vendor upper-level protocols.

- *Phase 2 – Mid Term (1989 – 90).* DDN should be able to support all the required International Standards Organization (ISO) protocols and network directory services during this timeframe, replacing vendor-unique solutions implemented in the near-term phase. However, DDN use will still be restricted to high-priority, low-bandwidth transmissions. Interoperation IGs will accept an increasing amount of the data access burden, transparent to the user. Major additions to the CALS architecture in this phase are:
 - ▶ Dynamic routing protocols
 - ▶ Network management protocols
 - ▶ Virtual Terminal Protocol (VTP) Basic Class to support inquiry and mail applications for remote CALS users.
- *Phase 3 – Long Term (1991 – 92).* DDN should be able to support on-line transfer of the bulk file data associated with CALS projects. Integration IGs focus on semantic issues associated with providing access to information. They appear to the user as a single database but require no changes to the actual dissimilar databases. Also in this phase, the VTP Forms Class standard, the ISO video text protocol, the ISO layer management standards, and BLACKER encryption methodology will be available. Retrofitting BLACKER to ISO standards will be dependent on the form that the eventual ISO security standard takes.

The next CALS standard will be the Product Data Exchange Specification (PDES) which will include the data needed to manufacture and support a product from a design database. The core of PDES will then be expanded in a phased way to support reliability and maintainability design analysis, diagnostics development, and authoring of technical manuals and training materials. Industry is cooperating with DoD in developing this standard.

1.3 DEMONSTRATION AND VALIDATION.

The strategy for CALS demonstration and validation involves:

- Establishing tests and a certifying mechanism to ensure that components of information systems conform to standards
- Establishing CALS test beds to be used to verify applications and standards

- Pursuing technology programs to develop new applications needed to meet CALS Phase 3 requirements
- Selecting weapons programs in which the new applications will be:
 - ▶ Demonstrated starting early in the advanced development phase
 - ▶ Implemented throughout the development of the programs.

The technology for advanced CALS applications is being demonstrated in a number of Service and DoD agency projects. These are described in the report referenced in Section 1.2.

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