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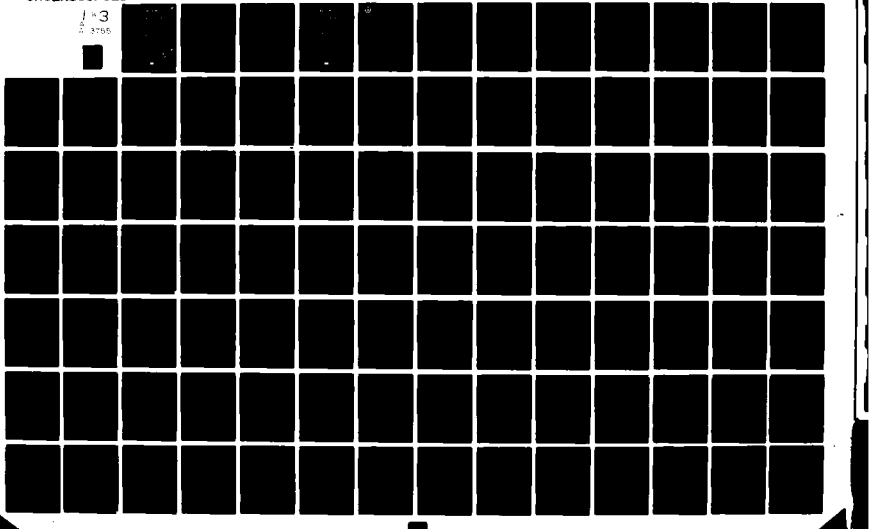


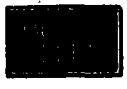
FINAL REPORT

DEFENSE ADP ACQUISITION STUDY

30 NOVEMBER 1981

PREPARED FOR:
HEADQUARTERS, U.S. AIR FORCE
ADP ACQUISITION IMPROVEMENT GROUP
and the
DEFENSE SYSTEMS MANAGEMENT COLLEGE
FORT BELVOIR, VIRGINIA 22060

BOOZ•ALLEN & HAMILTON Inc.



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ADP Requirements

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The purpose of this study was directed at determining methods of reducing the time and costs involved in the Air Force acquisition of general purpose automatic data processing (ADP) resources. The focus of the study was on methods of improving the ADP acquisition process by (1) reducing ADP acquisition lead time, (2) minimizing ADP technology lag, and (3) improving the ADP requirements definition and approval process.

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BOOZ•ALLEN & HAMILTON Inc.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, D.C.

24 DEC 1981

SUBJECT: Booz Allen and Hamilton Final Report on the Defense ADP Acquisition Study

1. The research and analytical work documented in this report was sponsored by the Defense Systems Management College under contract No. MDA 903-80-C-0490, and monitored by the Air Force ADP Acquisition Improvement Group, HQ USAF. The report is the product of a comprehensive examination of the Federal ADP acquisition environment and it addresses a wide range of technical, statutory, regulatory, and management issues. It also provides broad insight into the nature and causes of problems in the ADP acquisition process and offers several strategies for improvement.

2. As a major source of information on ADP acquisition practices and associated problems, the report has been extremely useful in developing a plan to improve internal Air Force ADP acquisition practices. It does not, however, necessarily reflect the opinions or conclusions of its sponsors, nor does it represent an Air Force position on specific improvement approaches.

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November 30, 1981

Defense Systems Management College
Department of Research and Information
Fort Belvoir, Virginia 22060

Attention: Mr. John McKeown

Subject: Letter of Transmittal for Delivery of Final Report, Contract No. MDA 903-80-C-0490

Dear Mr. McKeown:

We are pleased to submit the attached Final Report of the Defense ADP Acquisition Study in accordance with Task 9 of the Statement of Work. Written comments to the draft report were discussed with the Air Force Acquisition Improvement Group and have been incorporated in this Final Report.

The major findings, conclusions, and recommendations are summarized in an Executive Summary which precedes the main body of the report.

We have enjoyed our participation in this study of the DOD ADP acquisition procedures, and we would like to express our sincere appreciation to the Acquisition Improvement Group of the Air Force Director of Computer Resources for their support in obtaining much of the information used throughout the study. If you have any questions regarding the enclosed report, or if we can be of further assistance, please call on us.

Very truly yours

Christian S. Young

BOOZ · ALLEN & HAMILTON, Inc.

Christian S. Young
Senior Vice President

enclosure

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TABLE OF ABBREVIATIONS

A

ACD	-	AF Directorate of Computer Resources
ADAPSO	-	Association of Data Processing Service Organizations
ADP	-	Automatic Data Processing
ADPE	-	Automatic Data Processing Equipment
ADPR	-	Automatic Data Processing Resources
ADPS	-	Automatic Data Processing System
ADS	-	Automated Data System
ADTS	-	Automated Data and Telecommunications Service
AFADPP	-	Air Force ADP Plan
AFCAC	-	Air Force Computer Acquisition Center
AFCC	-	Air Force Communications Command
AFDSC	-	Air Force Data Services Center
AFDSDC	-	Air Force Data Systems Design Center
AFDSEC	-	Air Force Data Systems Evaluation Center
AFR	-	Air Force Regulations
AFLC	-	Air Force Logistics Command
AFSC	-	Air Force Systems Command
AIG	-	Acquisition Improvement Group
AIS	-	Automated Information Systems
AL	-	Acquisition and Logistics
ALS	-	Advanced Logistics System
AMP	-	ADPS Master Plan
ANSI	-	American National Standards Institute
APR	-	Agency Procurement Request
ASD(C)	-	Assistant Secretary of Defense (Comptroller)
ATC	-	Air Training Command

C

CBD	-	Commerce Business Daily
CBEMA	-	Computer and Business Equipment Manufacturers' Association
CCIA	-	Computer and Communications Industry Association
CCPC	-	Communications Computer Programming Center
CDI	-	Comprehensive Dissertation Index
CDR	-	Critical Design Review
CI	-	Configuration Item
CINC	-	Commander-In-Chief
CIS	-	Congressional Information Service
CMP	-	Configuration Management Plan
CPCI	-	Computer Program Configuration Item
CRISP	-	Computer Resources Integrated Support Plan

D

DAP	-	Data Automation Panel
DAR	-	Defense Acquisition Regulations
DAR	-	Data Automation Requirement
DDA	-	Directorate of Data Automation
DCS	-	Deputy Chief of Staff
DMP	-	Data Management Plan
DOC	-	Department of Commerce
DOD	-	Department of Defense
DODD	-	Department of Defense Directives
DODI	-	Department of Defense Instructions
DPA	-	Delegation of Procurement Authority
DPD	-	Data Project Directive
DPP	-	Data Project Plan
DS	-	Data Base Specification
DT	-	Development Test Plan
DTIS	-	Defense Technical Information Service

E

EA	-	Economic Analysis
EO	-	Executive Order

F

FAR	-	(Proposed) Federal Acquisition Regulation
FCA	-	Functional Configuration Audit
FEDSIM	-	Federal Computer Performance Evaluation and Simulation Center
FIPS	-	Federal Information Processing Standards
FM	-	Financial Management
FMC	-	Federal Management Circular
FPMR	-	Federal Property Management Regulations
FPR	-	Federal Procurement Regulations
FPS	-	Federal Procurement System
FS	-	Feasibility Study
FSS	-	Federal Supply Schedule

G

GAO	-	General Accounting Office
GFE	-	Government Furnished Equipment
GP	-	General Purpose
GSA	-	General Services Administration

H

HAC	-	House Appropriations Committee
HASC	-	House Armed Services Committee
HGOC	-	House Government Operations Committee
HOI	-	Headquarters Operating Instructions

HOL	-	Higher Order Language
HQ	-	Headquarters
HW	-	Hardware

I

IFB	-	Invitation for Bids
ILSP	-	Integrated Logistics Support Plan
IN	-	Intelligence
IOC	-	Initial Operational Capability
IPSC	-	Information Processing Standards for Computers
IRM	-	Information Resources Management
ISO	-	International Standards Organization

L

LCC	-	Life Cycle Costs
LCM	-	Life Cycle Management
LE	-	Logistics and Engineering
LTOC	-	Lowest Total Overall Cost

M

MAJCOM	-	Major Command
MCAP	-	Major Command or Separate Operating Agency ADP Plan
MIS	-	Management Information System
MM	-	Maintenance Manual
MP	-	Manpower and Personnel
MPC	-	Military Personnel Costs

N

NBS	-	National Bureau of Standards
NTIS	-	National Technical Information Service

O

OEM	-	Original Equipment Manufacturer
OFMP	-	Office of Federal Management Policy
OFPP	-	Office of Federal Procurement Policy
OI	-	Operating Instruction
OIRA	-	Office of Information and Regulatory Affairs
OJT	-	On-the-Job Training
OM	-	Operator's Manual
OMB	-	Office of Management and Budget
OPR	-	Office of Primary Responsibility
OSD	-	Office of the Secretary of Defense
OSD(C)	-	Office of the Secretary of Defense, Comptroller

P

PA	-	Programs and Evaluation
PAR	-	Projected Automation Requirement
PCA	-	Proposed Configuration Audit
PDR	-	Preliminary Design Review
PL	-	Public Law
PM	-	Program Manager
PMD	-	Program Management Directive
PMO	-	Program Management Office
PMP	-	Program Management Plan
POM	-	Program Objectives Memorandum
PPBS	-	Planning, Programming, and Budgeting System

PRP	-	President's Reorganization Project
PS	-	Program Specification
PT	-	Test Plan
PVR	-	Product Verification Review

Q

QA	-	Quality Assurance

R

RD	-	Data Requirements Document
RD	-	Research and Development
RFP	-	Request for Proposal

S

SAC	-	Strategic Air Command
SAC	-	Senate Appropriations Committee
SADSC	-	San Antonio Data Services Center
SASC	-	Senate Armed Services Committee
SAF	-	Secretary of the Air Force
SAF/FM	-	Secretary of the Air Force/Financial Management
SDN	-	System Development Notification
S&I	-	Surveys and Investigations
SDR	-	System Design Review
SEMP	-	System Engineering Management Plan
SOA	-	Separate Operating Agency
SRR	-	System Requirements Review
SSA	-	Source Selection Authority
SS	-	System Specification
SVR	-	System Validation Review
SW	-	Software

T

T/A	-	Table of Allowances
TEMP	-	Test and Evaluation Master Plan

U

UM	-	Users Manual
UPS	-	Uniform Procurement System
USC	-	U.S. Code, Annotated

W

WWMCCS	-	Worldwide Military Command and Control System

X

XO	-	Operations, Plans, and Readiness

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

In early 1980 the Assistant Secretary of the Air Force for Financial Management (SAF/FM) directed that a study be done to determine methods of reducing the time and costs involved in the Air Force acquisition of general purpose ADP resources. Specifically, the focus was on methods of improving the ADP acquisition process by:

- Reducing ADP acquisition lead time
- Minimizing ADP technology lag
- Improving the ADP requirements definition and approval process.

A secondary objective of the study was to provide an ADP resource library and case study materials to support acquisition management instruction programs.

This report documents the results of the Defense ADP Acquisition Study, prepared for the Defense Systems Management College, Ft. Belvoir, Virginia, in conjunction with the Air Force Directorate of Computer Resources, Washington, D.C. The report is divided into six chapters. Each chapter is summarized in this Executive Summary.

1. THE ADP ACQUISITION PROCESS

The Air Force ADP acquisition process can best be described in terms of the policy environment and the specific activities comprising the process.

(1) The Policy Environment Is the Regulatory Structure and Organizational Hierarchy Impacting the Process

Federal ADP policy has its foundation in public law and is implemented throughout the Federal structure by directives, circulars, regulations, pamphlets and standards from the numerous organizations involved. The policy environment within which the AF ADP program functions includes the following:

- Congress enacts laws, particularly PL 89-306 (the "Brooks Act").
- Executive Orders direct Federal organizational roles and responsibilities.
- OMB communicates policy and procedural guidance through issuance of circulars.
- GSA issues both Federal Procurement Regulations (FPRs) and Federal Property Management Regulations (FPMRs) governing ADP acquisition.
- DOD issues Defense Acquisition Regulations (DARs) as the principal DOD procurement regulation system.
- OFPP issues pamphlets to provide procurement policy guidance to agencies in applying OMB circulars to their ADP acquisition activities.
- The National Bureau of Standards (NBS) issues Federal Information Processing Standards (FIPS) setting forth Federal standards and guidelines.
- DOD Directives and Instructions implement Federal policy and provide direction to the military departments.
- Secretary of the Air Force Orders delineate ADP roles and reponsibilities within the Air Force.

In 1965 the Brooks Act, PL 89-306, amended the Federal Property and Administrative Services Act of 1949 "to provide for the economic and efficient purchase, lease, maintenance, and utilization of automatic data processing equipment by Federal departments and agencies." The law established a structural framework and centralized procurement authority to control the acquisition of ADP resources. The basic authorities of OMB, GSA, Commerce, and the user agencies relative to ADP are outlined in the law.

(2) The Process Description Is Presented in Terms of the Participants and Their Activities

The Air Force acquisition process for general purpose ADP resources can be described in terms of its scope, the organizational participants, the process steps, processing thresholds and management of the ADP program. The following comments touch upon these subjects:

- The AF 300 Series Regulations encompass the acquisition of all general purpose ADP resources except those acquired in combat weapons systems and specially designed equipment.

- The senior ADP policy official for the Air Force is the Assistant Secretary of the Air Force for Financial Management.

- The Director of Computer Resources (USAF/ACD) is the Air Force ADP program single manager and has been delegated management authority for developing plans, policy guidance and procedures for planning, programming and budgeting for general purpose ADP; for approving data automation requirements and directing and monitoring ADP acquisitions; for performing liaision with GSA and other Federal organizations; and for providing technological expertise to the Air Force.

- Major Commands (MAJCOM) and Separate Operating Agencies (SOA) have their ADP Program Single Managers who are responsible for providing ADP support for the Command mission.

- An ADPS (automatic data processing system) is an aggregation of software and the resources required to support it (equipment, software, manpower and facilities). ADPS managers are appointed for command unique and USAF standard ADPS.

- The Deputy Commander for Data Automation of Air Force Communications Command (AFCC) is responsible for managing AFCC resources to provide ADP support to Air Force activities. The subordinate (ADP) elements of AFCC include:

- Air Force Computer Acquisition Center (AFCAC)
- Air Force Data Systems Design Center (AFDSDC)
- Air Force Data Services Center (AFDSC)
- Federal Computer Performance Evaluation and Simulation Center (FEDSIM)
- Communications Computer Programming Center (CCPC)
- Air Force Data Systems Evaluation Center (AFDSEC)
- San Antonio Data Services Center (SADSC)
- Phase IV Program Management Office.

. The ADP Review Board reviews the Air Force ADP Program and advises the SAF/FM on major ADP policies and projects.

. The Data Automation Panel (DAP) conducts the Air Staff Board Structure programming and budgeting review of the Air Force ADP Program.

. The Air Force ADP acquisition process starts with the identification of a requirement for ADP and proceeds from requirement definition to requirement approval, to technical specification development, to procurement, to installation and test.

. Requirements definition and approval is a rigorous series of steps described in great detail in the AFR 300 Series regulations. The requirement is documented in a DAR (Data Automation Requirement).

. Threshold values govern the level of approval authority required for an ADP acquisition. The following individuals are authorized to approve ADP acquisitions:

- The Air Force Senior Policy Official (SAF/FM)

- The Air Force ADP Program Single Manager
- Command ADP Program Single Managers
- USAF ADPS Managers
- Command ADPS Managers.

2. EVALUATION OF FINDINGS

The performance of the Air Force process for acquiring general purpose ADP was evaluated by both a statistical and a comparative analysis. The process was also examined in relation to two fundamental questions.

. Is the Air Force incurring damage by the current ADP acquisition process?

. If so, what are the causes of the damage?

(1) Process Performance Evaluation Revealed That the Process Is Unnecessarily Lengthy

The performance of the Air Force process for acquiring general purpose ADP was evaluated along two approaches. First, a classical process evaluation was performed by statistically analyzing the acquisitions that go through the process. This approach focused on the dwell times required to complete each step and the variances in processing time, depending upon what is being processed. Voids in the available statistical data inhibited the statistical analysis. However, to the extent that the statistical evaluaton could be carried out, it indicated that the variances in processing time are more related to unique aspects of individual acquisitions than to factors that could be captured by aggregate statistical analysis. There was only a slight correlation between the size and type of acquisition and the time required for the acquisition process.

The second approach to process evaluation was to compare the Air Force performance to that of private industry in acquiring similar ADP resources. Using the performance of industry as an outside standard, it was determined that the Air Force takes an average of three times as long as industry to acquire ADP. This indicates that there is nothing inherent in the acquisition of general purpose ADP that generates lengthy acquisition times, but rather, the basis for the delays is related to the Air Force acqusition process.

(2) The Current Air Force Acquisition Process Imposes Two Types of Damage on the Air Force: Excessive Acquisition Cost and Capability Loss

ADP acquisition time in the Air Force is excessive. A more significant cost imposed by the current acquisition process is technology lag. Newer equipment not only offers greater capability but also results in cost savings. The following changes occur with newer technology equipment and result in reduced costs:

- Less maintenance
- Fewer operators
- Less energy consumption
- Improved system reliability
- Less floor space
- Less personnel
- Lower power for uninterruptible power supplies.

Capability loss arises because of either a failure to acquire needed capability or a failure to accommodate growth. Failure to acquire needed capability may result from a decision by a user that satisfying a requirement is not worth the effort of going through the acquisition process.

(3) Analysis of Issues Reveals the Root Causes for the Damage

The collection of data from literature, government and industry sources resulted in a large volume of information addressing a variety of perceived problem areas which contributed to the damage cited in the previous section. These data were sorted into 33 issues and analyzed to determine the recurring causes for the poor process performance. They were further analyzed to identify whether the causes were within the capability of the Air Force to correct or if they required corrective action by organizations external to the Air Force.

The analyses revealed the following root causes which have a direct bearing on the current state of the ADP acquisition process:

- Hardware orientation and solutional focus of the ADP acquisition process
- Ineffective use of skills and personnel resources
- Inflexibility in the acquisition and management of ADP
- Failure of the ADP acquisition process to adapt to a changing environment
- Lack of accountability and end-to-end management in the process
- Lack of a mission orientation
- Lack of systems management and life cycle perspectives
- Lack of effective leadership and policy direction
- Inconsistency in policy, direction and management of ADP.

3. STUDY CONCLUSIONS

The five major conclusions of the study follow. For emphasis, those areas internal to the Air Force are presented first.

(1) While External Influences May Be the Source of Many Problems in the Air Force ADP Acquisition Process, Major Improvement Can Be Achieved by Redirections Within the Air Force

Many of the major constraints on ADP acquisitions are self-imposed. There are a variety of causes for these constraints. In some cases, policies which once promoted effectiveness and efficiency now constrain the achievement of these goals because of a changing environment or differing needs. Some policies have always been constraining to the process because they were based on erroneous perceptions of the external environment.

(2) The Current ADP Acquisition Process Objectives Underemphasize Mission Essentiality in Favor of a Primary Emphasis on Achieving the Goals of Economy and Efficiency

The most frequently mentioned objectives cited for the ADP acquisition process are achieving economy and efficiency and maximizing hardware competition. While these were legitimately given primary consideration in an era when it was appropriate to do so, the ADP environment has changed considerably.

1. The Tenets of Efficiency and Economy Are Based on Assumptions Which Do Not Reflect Current Realities

Hardware is no longer the primary cost component. The cost of software, services and facilities is increasing while hardware costs decrease.

2. Emphasis in the ADP Acquisition Process Must Be Placed on Satisfying Operational Needs as Well as on Achieving Efficiency

Because the current process responds primarily to the goal of maximizing efficiency, cost versus effectiveness tradeoffs are not generally performed.

3. The ADP Acquisition Process Lacks the Proper Degree of Planning to Effectively Focus on Mission Needs

Current long-range strategy planning fails to provide the appropriate mission perspective. Current top-down strategic planning does not provide the necessary guidance for the AF ADP program. Long-range planning at the MAJCOMs and SOAs does not provide a mission-oriented focus. The AFADP Plan is of little value in planning activities at MAJCOM/SOAs.

4. The Current ADP Acquisition Process Is Inflexible and Overly Restrictive

The AFR 300 Series regulations reflect this restrictiveness and inflexibility. The 300 Series documentation requirements are duplicative and solution-oriented. They result in delays and

less than optimal decisions. The great extent of the documentation contributes significantly to the acquisition lead time.

(3) The Air Force ADP Management Structure and Organization Contribute to the Confusion and Thus to Delays in Acquiring ADP

The Air Force has established a unique structure for the management and acquisition of ADP; it is unlike the process used for acquiring other systems. There is confusion as to what acquisitions belong in the 300 and the 800 acquisition process, and there is little corporate-level review to specifically insure that acquisitions are channeled correctly. There is also a lack of end-to-end management accountability in the current process design.

(4) Acquisition Under the Current Process Demands Skills That Are Scarce, and This Inhibits the Efficiency of the Process

A variety of skills are required in the ADP acquisition process; not only are they lacking, but training to provide these skills is limited. Defining requirements, preparing a DAR, and developing specifications do not occur frequently in a career, and people are untrained for the tasks.

(5) The Confusion and Inefficiencies Introduced Into the ADP Acquisition Process by Top-Level Federal Policy Have Their Roots in Conflict Over the Proper Direction of Acquisition Reform

There are conflicting philosophies at the congressional level between the House Government Operations Committee (which stresses maximum competition) and the House Appropriations Committee (which stresses lowest total overall cost). The HGOC exerts greater influence in the ADP acquisition process. The indistinct roles and responsibilities of OMB and GSA hinder effective policy development and implementation. Faced with conflicting philosophical positions and contradictory guidance, ASD(C) has responded inadequately to the needs of the services' ADP acquisition community.

4. RECOMMENDATIONS

Correction of the deficiencies identified in the study requires an integrated set of recommendations which address fundamental changes in the acquisition process as

well as specific changes in policy, procedures, roles and responsibilities. The recommendations presented here are more appropriately labeled strategies for change, rather than specific actions for improvement.

(1) <u>There Must Be a Clear Recognition That the Purpose of the ADP Program Is to Fulfill Mission Needs, and Responding to That Mission Must Be the Primary Objective of the ADP Program</u>

While mission primacy is not exclusive of other acquisition objectives, satisfaction of operational needs cannot be sacrificed to achievement of these other objectives. The process objective should be to satisfy mission needs, within the required time, at the lowest life cycle cost. Competition should be used to the maximum extent practical to satisfy this objective. Strategic planning, as an essential element of mission primacy, should be instituted.

(2) <u>In Light of the Mission Primacy Objective, the Process Must Be Modified to Incorporate Flexibility to Accommodate Changing Needs and Adaptability to a Changing Environment</u>

Fundamental changes are required in the process design. Five major changes are recommended.

- There must be a clear, strong and obvious linkage between Air Force mission planning and ADP acquisition program identification.
- The decision to approve a need should be made as part of funds approval in the Planning, Programming, and Budgeting System (PPBS).
- The decision to approve the ADP solution and the acquisition strategy should be separated from the need approval and be delegated to a lower decision authority.
- The process design should be based on proven systems management practices:
  - Program Management System
  - Life Cycle Systems Management
  - Decentralized execution of the acquisition.

- Acquisition process regulations and procedures should be simplified to enhance understanding and encourage flexibility.

(3) Internal Roles, Responsibiliies and Organizational Missions Must Be Modified to Accommodate Changes in the Process

This study identified four major deficiencies (concerning people) which constrain the effective acquisition of ADP -- the mismatch of roles and skills, the inconsistencies in the management of and organization for ADP, the lack of end-to-end accountability, and the lack of effective leadership and guidance. To correct these deficiencies, together with the recommended changes in the process, necessitates changes in three areas.

1. The role of the single managers at the MAJCOM/SOA level should be strengthened by increasing their approval thresholds, by giving them greater authority to reallocate funds, and by expanding their authority to initiate programs. Also, skill levels in certain disciplines must be enhanced and made available to the MAJCOM/SOA program managers, e.g., systems engineering, program management and planning, logistics support, configuration management and operational planning. For those MAJCOM/SOAs with recurring acquisition programs requiring those disciplines, personnel with these skills should be under the direction of the single manager.

2. The Deputy Commander for Data Automation in AFCC should have primary responsibility for USAF standard ADPS, and support responsibilities to the MAJCOM/SOA single managers. Within the AFCC Centers are areas of expertise which are limited elsewhere in the Air Force. This expertise should be made available to support the MAJCOM/SOA non-standard systems on an as-needed basis.

3. Adoption of the preceding recommendations requires a reallocation of roles and responsibilities on the Air Staff. Future consideration should be given to consolidating the responsibilities for the management of telecommunications, ADP, and computer-based office systems. Responsibility for the management of ADP should be consistent with the organization of the Air Staff.

- Contracting and acquisition responsibilities should be assigned to AF/RDC.

- Responsibilities concerning the generation, approval and management of requirements should be distributed within AF/RD.

- Operational responsibilities for ADP systems should reside within AF/XO.

- Certain ADP support responsibilities should be assigned to AF/LE.

(4) External to the Air Force, Previous Recommendations Should Be Complemented by Changes in Policy and Modification of Organizational Roles and Relationships

Achieving maximum benefit from the recommended Air Force process improvements requires some attention to the external organizations which influence the process -- principally OSD. The Air Force should concentrate on encouraging OSD to take a stronger, more active and visible role in Federal ADP matters. The Air Force should encourage OSD to:

- Adopt consistent realignments of roles and responsibilities within DOD similar to the realignments proposed for the Air Force.

- Simplify DOD directives and instructions and ensure consistency with Federal ADP policy and acquisition regulations.

- Regain credibility with Congress through improved relations and demonstrations of competent ADP resource management.

- Assume a more dyamic role in relations with Congress, OMB, and GSA so as to assert DOD influence on Federal ADP policy formulation, particularly regarding the implementation of PL 96-511 and UPS.

5. IMPLEMENTATION APPROACH

The use of the Air Force Acquisition Improvement Group (AIG) to implement the recommendations is key, if not critical. The implementation addressed here is in terms of the ADP acquisition process, the realignment of roles and responsibilities, and the activities of the AIG.

(1) Implementation of the Revised Process Requires a Series of Steps That Recognize That the ADP Acquisition Process Is Ongoing

Many ADP acquisition activities are keyed to the PPBS. At this time it is realistic to expect that all recommendations could be implemented in time to affect the FY85 budget call. The following specific steps should be taken:

- Brief external agencies on the impending changes
- Appoint program managers for all programs that have survived the PPBS process
- HQ USAF begin developing planning guidance for the FY85 budget call
- MAJCOM/SOAs implement new planning guidance
- Revise Air Force Regulations
- Initiate personnel and training actions to eliminate shortages of skills
- HQ USAF establish a program to monitor and evaluate the process performance.

(2) Realignment of Roles and Responsibilities Should Be Accomplished at HQ USAF and MAJCOM/SOAs

The following implementation actions are presented in their recommended sequence:

- Strengthen the single manager's roles and responsibilities
- Revise the role of AFCC in the acquisition process
- Realign ADP responsibilities within the Air Staff
- Transition the ADP acquisition executive responsibilities from SAF/FM to SAF/AL.

(3) <u>The Acquisition Improvement Group Should Undertake Certain Implementation Actions While Further Analyzing Other Subjects</u>

Implement:

- Brief external agencies
- Develop interim guidance for single managers
- Develop planning guidance
- Develop alternative ADP acquisition approaches
- Revise AFR 300 Series
- Support development of the plan to transfer ADP responsibilities within the Air Staff.

Study further:

- Life cycle model for ADP
- Criteria for defining technological and economic obsolescence
- Alternative ADP acquisition approaches
- ADP Program Manager's Handbook
- Need for a HQ USAF office responsible for telecommunications, ADP, and computer-based office systems.

I. INTRODUCTION

I. INTRODUCTION

This report describes and documents the research, conclusions and recommendations of the Defense ADP Acquisition Study, completed for the Defense Systems Management College under the auspices of the Air Force Directorate of Computer Resources, HQ USAF/ACD.

1. OBJECTIVE AND SCOPE

This study investigated the existing Air Force ADP acquisition process in order to formulate methods of reducing the time and costs involved in the acquisition of general purpose ADP resources. The study focus was on methods of improving the ADP acquisition process by:

- Reducing ADP acquisition lead time
- Minimizing ADP technology lag
- Improving the ADP requirements definition and approval process.

A secondary objective of the study was to provide an ADP resource library and case study materials to support acquisition management instruction programs.

Specific study activities included:

- Investigating the environment of the acquisition process through a review of the management structure that influences the process, i.e., the regulatory and organizational hierarchy
- Reviewing previous reports from Government and industry sources concerning problems in ADP acquisition
- Interviewing representatives from the Air Force, civil agencies, and private organizations
- Examining a number of cases of ADP acquisitions by private commercial firms in order to compare Government and industry methods
- Identifying and analyzing issues to determine the root causes for poor process performance

- Suggesting process improvements that address the underlying and pervasive problems inhibiting success of the acquisition process

- Preparing case studies of recent ADP acquisitions to evaluate the effectiveness of the process.

While the purpose of the study was to identify improvements to the ADP acquisition process for the entire Department of Defense, the study methodology was confined to an analysis of the procedures implemented within the Air Force. The problems and constraints in acquiring ADP are not unique to the Air Force; the recommendations proposed in this study can be applied in concept to the other service branches.

2. METHODOLOGY

The methodology used to study the ADP acquisition process followed the classical research technique of information gathering, analysis and reporting. The study was divided into five phases:

- Problem identification and research planning, including determination of data sources and data collection methods

- Data collection, including formatting and documentation for subsequent use

- Data reduction, analysis, and integration

- Formulation of recommendations

- Documentation of research results.

(1) The ADP Acquisition Process Definition Provided the Project Orientation

The initial study efforts focused on defining the Air Force ADP acquisition process and analyzing it from the point of view of the study objectives. The approach was to flowchart the ADP acquisition process, as it is defined in the AFR 300 series regulations, and while doing so, to identify problem areas in the acquisition of ADP as perceived by senior Air Force officials.

Once the acquisition process was charted, and major problem areas identified, the next step was the development of a research plan. Hypotheses and key

questions were developed to guide the study efforts. At the same time, information sources were identified, and interview guides were designed for use in the data collection phase.

(2) The Detailed Data Collection Was Conducted Utilizing Three Major Sources

The research plan required that data collection efforts focus on three major sources:

- Literature
- Government
- Industry

These data sources are described below.

1. The First Data Source Was the Extensive Body of ADP Acquisition Literature

A comprehensive literature review was conducted in three parallel efforts. The development of the ADP acquisition library and review of incoming reference material provided the initial screening for key resources. A parallel data collection task involved an indepth review of the conclusions and recommendations of previous key studies and research reports. The third data collection task in the literature review consisted of an analysis of the policy environment, focusing on the legislative and regulatory hierarchy. The activities comprising the policy review included tracing legislative history and identifying inconsistencies in law or policy. Details of the literature review are presented in Appendix A.

2. The Second Source Was Data Drawn From Government Participants in the Process

Government survey teams conducted interviews and reviewed documentation at all levels of participation. With the exception of GSA in Denver, major Federal agencies involved in the ADP acquisition process were interviewed in the Washington, D. C. area. Documentation review and personal interviews were conducted throughout the Air Force. Interviews were conducted at Headquarters Air Force, at the headquarters of Major Air Commands (MAJCOMS), and at field activities

that play a key role in the Air Force ADP acquisition process. Those MAJCOMs not visited by the survey teams were surveyed by written questionnaire. In addition to the general Government survey, personal interviews and case file reviews at HQ Air Force and at some MAJCOMs (for the five acquisition cases) were conducted as part of this study. Details of the government survey are contained in Appendix B.

3. The Third Source Was Data Collected From Private Industry

The industry surveys were aimed at obtaining industry's perspective of how the Air Force process is working, obtaining views on problems and solutions, and finally, comparing industry practice for acquiring ADP with those of the Air Force. Information was gathered from hardware vendors, system integrators, Federal Contract Research Centers, and industry trade associations. In addition to investigating ADP suppliers, the ADP acquisition practices used by several firms in procuring fairly large ADP systems were investigated. Details of the industry review are presented in Appendix C.

(3) The Data Synthesis and Analyses Led to the Development of Study Conclusions

The data analysis employed a structured integration and interpretation of the qualitative and quantitative data from the three major data collection activities.

Quantitative data were subjected to statistical analyses, including correlation and regression analysis, to explore the relationship of key factors in various types of acquisitions. Critical Path Method (CPM) techniques were employed to analyze case study data.

Qualitative data obtained from the literature review and Government and industry surveys provided key insights into the acquisition process and the critical interactions of individuals and organizations. An understanding of the constraints imposed by external regulatory environment, gleaned from the policy review activity, was vital to the analysis of feasible alternatives for improvement.

Based on review and interpretation of the findings integrated from all sources, the perceived problems were postulated as issues requiring further analysis. To verify, amplify and document valid issues, the investigators thoroughly reviewed the source material from the Government, literature and industry surveys. Each significant reference to one or more of the postulated issues was summarized or recorded verbatim on an individual file card. The citation cards were then sorted by issue area. The end result was 33 clearly delineated issues, supported by a number of cards pertinent to the issue -- a clear audit trail back to original source data.

Detailed issue papers were prepared, based on the large volume of citations drawn from the data base of interviews and library resources. Analysis of the issues focused on synthesizing the numerous specific findings into a subset of basic conclusions as to the underlying causes of the pervasive problems in the AF ADP acquisition process. Study efforts concentrated on those issues that represented deficiencies correctable by the Air Force. Analyses revealed that the root cause of each of the problems was the violation of one or more principles requisite to effective management and efficient acquisition. Development of conclusions was, therefore, directed toward describing the implications of these violations for the process and its organizational participants. Exploring these implications prepared the study group for the formulation and analysis of alternative improvements that would incorporate the missing principles into the process.

(4) <u>The Study Conclusions Led to the Development of Recommendation Strategies</u>

Following verification of the inadequacies of the ADP acquisition process traceable to the violation of management principles, a series of analyses was initiated. These analyses were designed to identify alternatives and to develop significant, workable recommendations. Recommendations were evaluated based on their feasibility for implementation, projected benefits and costs, and contribution towards achievement of the project objectives of reducing lead time and technology lag and improving the ADP requirements generation and approval process. The development of the recommendations emphasized the derivation of a simplified process and modification of policies, procedures, and organizational roles and responsibilities requisite to implementation of the revised process.

(5) The Final Results of the Study Are Documented in This Report

This report contains the study findings, conclusions, recommendations, and implementation strategies. Chapter II deals with the regulatory environment and presents a detailed description of the current process. Chapter III is an evaluation of the findings, including a performance evaluation and analysis of the issues upon which the conclusions rest. The study conclusions are presented in Chapter IV, and the recommendations in Chapter V. Chapter VI outlines the approach recommended to implement the requisite changes within the Air Force. The Appendices, A-G, contain supporting data from the specific research tasks, as well as the five acquisition case studies.

II. THE ADP ACQUISITION PROCESS

II. THE ADP ACQUISITION PROCESS

This chapter provides the foundation for presentation of conclusions by describing the ADP Acquisition Process in terms of the policy environment and the specific activities comprising the process. The chapter is divided into the following two sections:

- The Policy Environment
- The Process Description.

Each of these foundation elements is discussed in detail to provide a background for the remainder of the report.

1. THE POLICY ENVIRONMENT IS THE REGULATORY STRUCTURE AND ORGANIZATIONAL HIERARCHY IMPACTING THE PROCESS

The first part of this section discusses the regulatory structure, and the organizational roles are described in the second part.

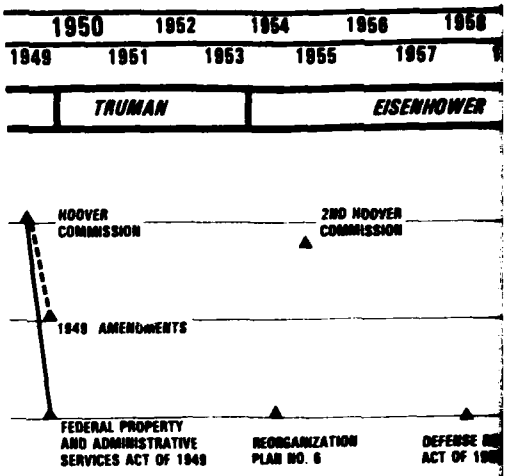
(1) Federal ADP Policy Has Its Foundation in Public Law; It Is Implemented Through Directives at the OSD Level and Regulations Within the Air Force

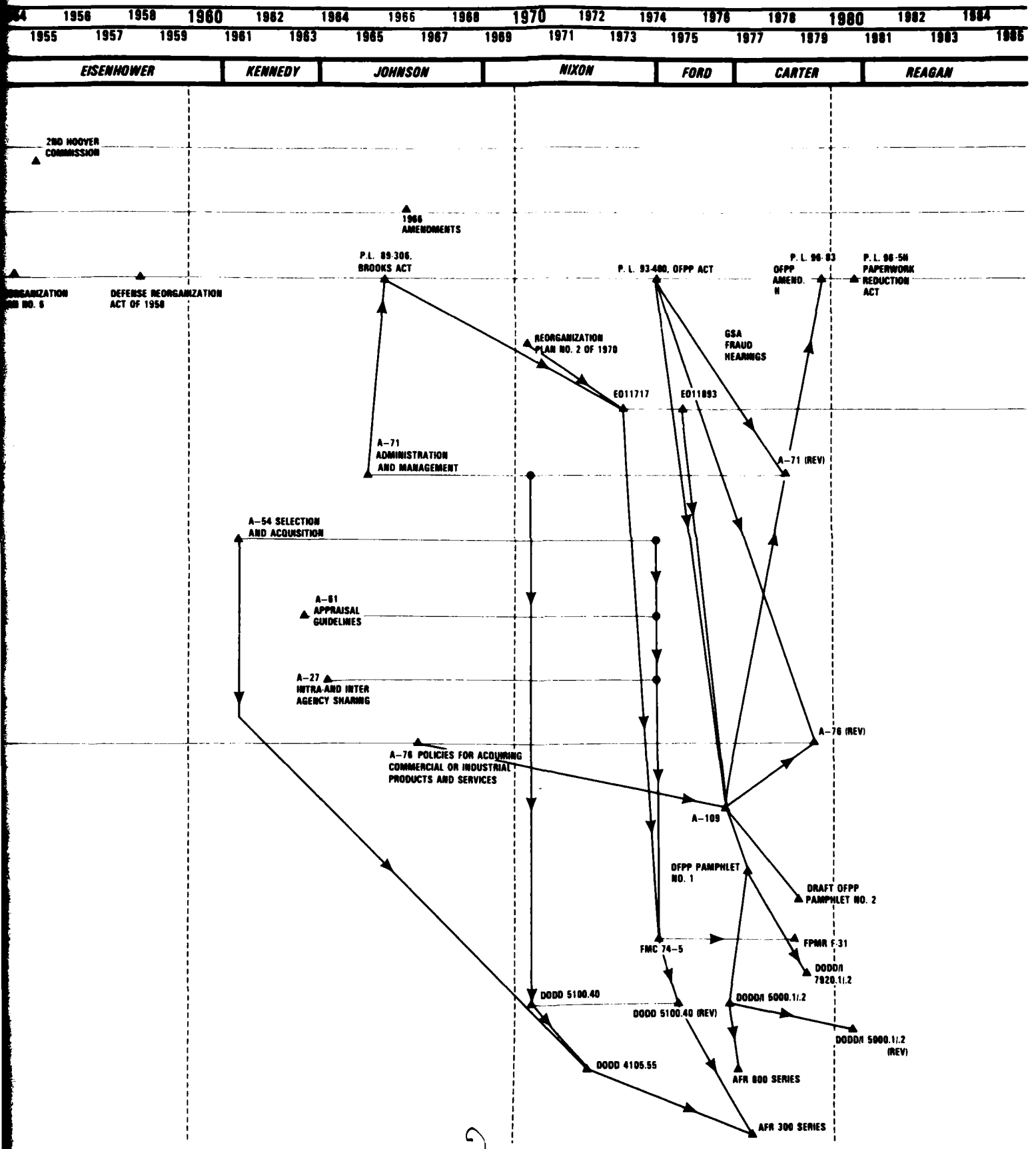
Air Force ADP acquisition is governed by a multitude of laws, executive orders, circulars, regulations, bulletins, and standards issued at the Federal level, as well as implementing directives and regulations developed by OSD and the Air Force.

The Federal procurement system has evolved into a complex interdependent series of functions, circumscribed by a proliferation of documents. In addition to two basic statutes, there are approximately 4,000 other individual statutory provisions addressing procurement, with unique requirements governing ADP. In developing the Federal Procurement System (formerly the Uniform Procurement System), the Office of Federal Procurement Policy (OFPP) recognized the existence of this nonintegrated body of procurement law and nonuniform procurement procedure as a principal contributor to the complexity of the procurement process. Figure II-1, a diachronic presentation of the policy environment, illustrates the sequence and relationships of the documents discussed here.

FIGURE II-1

DIACHRONIC CHART




1954 1956 1958 1960 1962 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984
1955 1957 1959 1961 1963 1965 1967 1969 1971 1973 1975 1977 1979 1981 1983 1985
EISENHOWER
KENNEDY
JOHNSON
NIXON
FORD
CARTER
REAGAN
2ND HOOVER COMMISSION
1966 AMENDMENTS
P.L. 89-306, BROOKS ACT
P. L. 93-400, OFPP ACT
P. L. 96-83 OFPP AMEND. II
P. L. 96-511 PAPERWORK REDUCTION ACT
DEFENSE REORGANIZATION ACT OF 1958
REORGANIZATION PLAN NO. 2 OF 1970
GSA FRAUD HEARINGS
EO11717
EO11893
A-71 ADMINISTRATION AND MANAGEMENT
A-71 (REV)
A-54 SELECTION AND ACQUISITION
A-61 APPRAISAL GUIDELINES
A-27 INTRA-AND INTER AGENCY SHARING
A-76 (REV)
A-76 POLICIES FOR ACQUIRING COMMERCIAL OR INDUSTRIAL PRODUCTS AND SERVICES
A-109
OFPP PAMPHLET NO. 1
DRAFT OFPP PAMPHLET NO. 2
FMC 74-5
FPMR F-31
DODDI 7920.1/.2
DODD 5100.40
DODDI 5000.1/.2
DODD 5100.40 (REV)
DODDI 5000.1/.2 (REV)
DODD 4105.55
AFR 800 SERIES
AFR 300 SERIES

The policy environment within which the AF ADP program functions includes the following:

- Public Laws
- Executive Orders
- Office of Management and Budget Circulars
- Federal Procurement Regulations and Federal Property Management Regulations
- Defense Acquisition Regulations
- Office of Federal Procurement Policy Publications
- Federal Information Processing Standards
- Department of Defense Directives and Instructions
- Secretary of the Air Force Orders
- Air Force Regulations.

These documents are described in depth in the following paragraphs.

1. <u>There Are Two Basic Statutes Providing the Framework for Government Contracting and Several Key Laws Specifically Related to ADP Acquisition and Management</u>

The two basic statutes governing contracting and providing authority to issue regulations are the following:

- Armed Services Procurement Act of 1947
- Federal Property and Administrative Services Act of 1949.

The Armed Services Procurement Act applies to the procurement activities of the DOD, while the Federal Property and Administrative Services Act primarily governs the civil agencies. However, the Brooks Bill was passed in 1965 as amendment to Title I of the Federal Property Act, adding a section on ADPE, and encompassing DOD activities. Each of the basic statutes has been amended without regard to the other, resulting in

numerous inconsistencies, the effect of which has been magnified through the issuance of implementing regulations and procedures.

Since 1965, the following laws have been enacted related to some aspect of ADP acquisition and management:

- PL 89-306
- PL 93-400
- PL 96-83
- PL 96-511.

Public Law 89-306, commonly referred to as the Brooks Bill, was enacted "to provide for the economic and efficient purchase, lease, maintenance, and utilization of automatic data processing equipment by Federal departments and agencies." The law established a structural framework and centralized procurement authority to ensure the wise expenditure of ADP funds in the face of rapidly increasing ADP use. The basic authorities of OMB, GSA, Commerce, and the user agencies relative to ADP are outlined.

The bill was enacted as an amendment to the Federal Property and Administrative Services Act of 1949. Legislative hearings and reports indicate that the intent was neither a marked departure from previous government policy, nor the advancement of new policies. PL 89-306 simply called for efficient and economic acquisition of ADP, and defined organizational responsibilities required to achieve that goal. Unfortunately, basic assumptions of 1965 technology have made the law's implementation somewhat less than effective in the face of a changing technological environment. The thrust of implementation has unduly emphasized hardware procurement and price competition.

Public Law 93-400, the Office of Federal Procurement Policy Act, passed in August 1974, directed the creation of the Office of Federal Procurement Policy (OFPP) within OMB, to "provide overall direction of procurement policies, regulations, and forms." With the passage of this law, Congress declared its policy to be the promotion of economy, efficiency, and effectiveness through the establishment of policies, procedures, and practices for acquisition of property and services "of the requisite quality and within the time needed at the lowest reasonable cost,

utilizing competitive procurement methods to the maximum extent practicable." The law seemed to take a rational approach to the relative priority of fulfilling a need versus achieving competition, as goals of the procurement process.

Public Law 96-83, the Office of Federal Procurement Policy Amendments of 1979, stated that OFPP should "provide overall leadership in the development and implementation of procurement policies," and instructed the development of a "Uniform Procurement System." The law also expressed a subtle shift in priorities from the 1974 OFPP Act. This amendment declared that Congress' policy was to, first, promote the use of full and open competition, and second, establish policies and procedures to ensure the acquisition of requisite quality goods and services, within the time needed, at the lowest reasonable cost. The goals of procurement, as stated in the proposed Uniform Procurement System, reflect this priority, referencing the mandate of P.L. 96-83.

Public Law 96-511, the recently enacted Paperwork Reduction Act of 1980, legislates the authority of OMB to "develop and implement Federal Information policies, principles, standards, and guidelines ... and oversee the acquisition and use of ADP, telecomunications, and other technology for managing information resources." The law establishes the Office of Information and Regulatory Affairs to serve as a focal point for leadership and central direction of Federal information resource management. It incorporates the P.L. 89-306 objectives of economy and efficiency while consolidating OMB's ADP responsibilities under P.L. 89-306 with information management functions, and indicates an underlying shift away from equipment management towards information management.

Implementation requires active agency participation and presents an opportunity for the Air Force to be instrumental in structuring policy to improve information resource management. The Air Force is an agency under P.L. 96-511, and is provided a direct link for communication with OMB to resolve ADP acquisition problems, and to "revisit" the Brooks Bill in terms of restructured policy. In defining ADP, Congress specifically excluded that which involves intelligence, cryptologic or command and control activities, and weapons systems or other systems critical to direct fulfillment of the military mission.

2. Federal Organizational Roles and Responsibilities Have Been Directed Through Executive Orders

In light of their impact on the ADP policy environment, the following two executive orders are of primary interest:

- EO 11717
- EO 11893.

Executive Order 11717 was issued on May 9, 1973, transferring certain functions from the Office of Management and Budget (OMB) to the General Services Administration (GSA) and the Department of Commerce. Specifically, OMB's functions with respect to policy control over ADP (except in relation to standards) were transferred to GSA, and its responsibility for approving ADP standards was transferred to the Department of Commerce. OMB maintained general management oversight and fiscal authority and, according to the interpretation of the Justice Department, responsibility for ADP "policy formulation." (see ref. 1) EO 11717 was partially superseded by EO 11893 in 1975, by which certain policy functions were transferred from GSA back to OMB. While these included most of those transferred to GSA in 1973, the EO did not transfer ADP policy control responsibilities back to OMB.

The effects of these two orders are discussed in subsequent portions of the report.

3. OMB Communicates Policy and Procedural Guidance Through the Issuance of Circulars

A number of OMB circulars have applied to certain aspects of ADP management. These include:

- OMB A-54
- OMB A-71
- OMB A-76
- OMB A-109.

On October 14, 1961, OMB (then Bureau of the Budget) issued A-54, which prescribed policies for making selections of equipment to be acquired for use in the ADP program of the executive branch, including determination as to whether the

ADPE to be acquired would be leased, purchased, or leased with an option to purchase. This circular was superseded by GSA Federal Management Circular 74-5 in 1974.

OMB Circular A-71, Responsibilities for the Administration and Management of ADP Activities, was published on March 6, 1965. The circular defines the responsibilities of executive agencies for the administration and management of ADP activities in an attempt to ensure maximum cooperation and coordination. Transmittal Memorandum No. 1, dated July 27, 1978, amplifies that portion of A-71 dealing with responsibilities and requirements for a Federal Computer Security Program. Since OMB had in fact been fulfilling such a role for ADP since 1959, A-71 recognized OMB's role as one of overall leadership and coordination. GSA was directed to assist in the achievement of increased cost effectiveness in the selection, acquisition, and utilization of ADPE, and the Department of Commerce (National Bureau of Standards) would provide technical advisory assistance and support the development of standards.

OMB Circular A-76, published March 3, 1966 (and Transmittal Memoranda No. 1, 2, and 3) establishes the policies for acquiring commercial or industrial products (not exclusively ADP) for government use. An August 30, 1967 revision (Transmittal Memorandum No. 1) clarified some provisions of the original circular and lightened the Federal agency workload in implementing its provisions. The basic policy set forth is reliance on the private enterprise system to supply the Government's needs, except where it is not in the Government's best interest. Specific circumstances under which the Government may provide products and services directly "in the national interest" are described.

OMB Circular A-109, Major Systems Acquisitions, dated April 5, 1976, describes policies and procedures to be followed in the acquisition of major systems by Federal agencies. Systems, as it used here, includes data processing equipment. Problems have arisen in the implementation of A-109 due to the absence of GSA procedural guidance, the difficulty in adapting the circular's provisions to ADP acquisitions, and the apparent conflicts between the A-109 approach and PL 89-306. These issues are analyzed in subsequent sections of the report.

4. GSA Issues Both Federal Procurement Regulations (FPR) and Federal Property Management Regulations (FPMR) Governing ADP Acquisition

The Federal Procurement Regulations are issued by GSA under the authority granted by the Federal Property and Administrative Services Act of 1949. The FPRs are the governing regulations applicable to the acquisition of items or services required by Federal agencies. The FPR is the civilian agency equivalent of the Defense Acquisition Regulations (DAR), and only certain specialized sections, including those applicable to data processing and ADP acquisitions, are mandatory for use by DOD. The relevant material is Part 1-4, Subpart 1 - 4.11, which was added to the FPR in October, 1976. Recent changes to the FPR indicate a willingness on the part of GSA ADTS to address the criticism of counterproductive, overly restrictive policy and procedure, and to move towards increased user agency autonomy and diminished hardware focus in ADP acquisitions.

Federal Property Management Regulations (FPMR) are also issued by GSA to provide specific guidance in the management and operation of equipment and activities. The sections relevant to ADP and Telecommunications Management are 101-35, 101-36, and 101-37, which are embodied in Subchapter F: ADP and Telecommunications. Responsibility and authority for the FPMR are delineated in the Federal Property and Administrative Services Act of 1949. Substantive changes to the FPMR, Subpart 101.35.2, were made concurrent to the recent FPR revisions.

5. The Defense Acquisition Regulations (DAR) Are Issued by the Department of Defense as the Principal DOD Procurement Regulation System

The DAR applies to all elements of the Defense Department and governs all DOD purchases and contracts for products, systems, and services. It provides detailed regulatory guidance on all aspects of acquisition, but is subordinate to the FPR in relation to ADP. There is some standardization between the DAR and the FPR, but there are many inconsistencies in definitions, procedures and forms. The proposed Federal Acquisition Regulation (FAR) will replace the FPR and major sections of the DAR, offering the prospect of uniformity and clarity in acquisition regulations.

6. OFPP Pamphlets Are Published to Assist Agencies in Understanding the Intent and Application of Policy

OFPP is the central source for procurement policy direction under the authority granted by P.L. 93-400 and P.L. 96-83. OFPP pamphlets offer guidance to agencies in applying OMB circulars to their activities. They are not official or binding implementing documents. OFPP Pamphlet No. 1 of August 1976 was prepared by OMB and OFPP to enhance understanding of the intent and application of the policies contained in OMB Circular A-109. OFPP Pamphlet No. 2 (Draft) of October 1978 was prepared jointly by GSA, OFPP and OMB to assist Federal agencies in applying A-109 to the acquisition of major ADP/telecommunications systems. No final version of this pamphlet has been released. In its Uniform Procurement System Proposal, OFPP has recognized ADP acquisition procedures to be sufficiently unique so as not to be subsumed by the UPS, apparently leaving revisions in such procedures to GSA ADTS.

7. The Federal Information Processing Standards (FIPS) Are the Official Publications Relating to Federal Standards and Guidelines

In order to carry out the Commerce Department's ADP responsibilities under PL 89-306, the National Bureau of Standards (NBS) provides technical advice and coordination of standards development through its Institute of Computer Sciences and Technology. The FIPS Publication Series provides general guidelines for numerous specific functions related to ADP, such as benchmarking, management of multi-vendor plug-compatible systems, standardization, and security.

8. DOD Directives and Instructions Implement Federal Policy and Provide Direction to The Military Departments

The DOD Directives and Instructions relevant to the acquisition and management of ADP are described in the following paragraphs.

DOD Directive 5000.1 - Major Systems Acquisitions, dated March 19, 1980.

This directive is the third issuance of DODD 5000.1. The first issuance in 1971 was prior to the publication of OMB Circular A-109. The

January 18, 1977, revision implemented the provisions of A-109 within DOD. The applicability of this directive was for "Major System Acquisition Programs" designated by the Secretary of Defense. For programs not designated as major system acquisitions the directive was to be used as a guide. In the March 18, 1980 revision, this statement was changed to read "the principles in this directive should also be applied, where appropriate, to the acquisition of systems not designated as major."

DOD Instruction 5000.2 - Major Systems Acquisition Procedures, dated March 19, 1980.

This instruction provides the supplementary procedures for implementing DOD 5000.1.

DOD Directive 5000.29 - Management of Computer Resources in Major Defense Systems, dated April 26, 1976.

This directive establishes policy for management and control of computer resources which are embedded in major defense systems. It establishes the Management Steering Committee for Embedded Computer Resources at the OSD level to oversee the implementation of the regulation into the Defense system acquisition process. This directive explicitly excludes general purpose, commercially available ADP assets that are administered under DODDs 4105.55 and 5100.40.

DOD Instruction 5010.27 - Management of Automated Data System Development, dated November 9, 1971.

DODI 5010.27 establishes uniform guidelines for managing the development of automated data systems administered under DODD 5100.40.

DOD Directive 5100.40 - Responsibility for the Administration of the DOD Automatic Data Processing Program, dated August 19, 1975.

DOD Directive 5100.40 establishes the DOD ADP Program and assigns responsibilities pursuant to OMB Circular A-71. It designates the Assistant Secretary of Defense (Comptroller) as the Senior DOD ADP Policy Official and directs the Secretaries of the Military Departments to "designate a senior ADP policy official to administer the DOD ADP Program within the organizational elements under their respective jurisdictions."

DOD Directive 7920.1 - Life Cycle Management of Automated Information Systems (AIS) dated October 17, 1978.

This directive establishes joint technical and functional policy governing the life cycle management and control of AIS, including full consideration of functional, ADP, and telecommunications requirements. It applies the principles of DODD 5000.1 and OMB Circular A-109 to all major AIS, and designates ASD(C) responsible for integrating and unifying the AIS management process within DOD. It further calls for the development and maintenance of functional, ADP, and telecommunications plans within each DOD component. The directive governs only those AISs utilizing ADPE encompassed by DOD Directive 5100.40.

DOD Instruction 7920.2 - Major Automated Information Systems Approval Process, dated October 20, 1978.

DODI 7920.2 establishes the review and decision process and procedures for implementation of a major AIS. (Note: The scope of applicability for both DODD 7920.1 and 7920.2 has been in question at both OSD and Air Force levels.)

9. Secretary of the Air Force Orders Delineate ADP Roles and Responsibilities Within the Air Force

The two principal orders pertaining to the ADP program are the following:

- SAFO 100.1
- SAFO 560.1.

Secretary of the Air Force Order (SAFO) 100.1 dated 27 May 1977 delineates the authority and the responsibilities of the Secretary, Under Secretary, and the Assistant Secretaries of the Air Force. It designates the Assistant Secretary for Financial Management (SAF/FM) as the Air Force Senior ADP Policy Official. It makes him responsible for administration of programs for design, improvement, and standardization of automated data systems, and also for the selection, acquisition, management and use of Automatic Data Processing Equipment and associated software (ADPE/S). It designates the Assistant Secretary for Acquisition and Logistics (SAF/AL) as the Air Force Acquisition Executive.

Secretary of the Air Force Order (SAFO) 560.1 dated 4 December 1978 outlines specific responsibilities of the Assistant Secretary of the Air Force for Financial Management (SAF/FM) as the Air Force Senior ADP Policy Official, pursuant to SAFO 100.1 It authorizes the SAF/FM to conduct the Air Force ADP Program and prescribes the delegations of management authorities, and responsibilities. The order also designates the Hq USAF Director of Computer Resources as the Air Force ADP Program Single Manager and delegates to him authority to approve ADP projects and expenditure of resources below specific cost thresholds.

10. Air Force Regulations Implement DOD Directives and Instructions

Acquisition policy is promulgated in the Air Force by two major bodies of regulations. The AF 300 series regulations, which are the principal focus of this study, apply to general purpose, commercially available ADP resources, and implement the policies evolving from PL 89-306. The AF 800 series regulations apply to major defense systems and implement the provisions of DODD 5000.1. The following is a summary of the relevant Air Force regulations:

AFR 300-2 - Data Automation: Managing the USAF Automated Data Processing Program, dated April 24, 1980.

AFR 300-2 establishes the Air Force ADP program and prescribes policies and responsibilities for managing ADP resources. In addition it defines the ADP approval threshold values and the relationships with other AF regulations.

AFR 300-6 - Automatic Data Processing Resource (ADPR) Management, dated July 11, 1980.

AFR 300-6 implements the provisions of DODD and DODM 4160.19 establishes requirements and contains guidance for managing ADP resources.

AFR 300-7 - Automatic Data Processing (ADP) Planning, dated February 11, 1977.

AFR 300-7 provides guidance for preparing and submitting AF ADP plans, Projected Automation Requirements (PARs), Major Command ADP Plans (MCAPs), ADPS Master Plans (AMPs) and the Air Force ADP Plan (AFADPP).

AFR 300-12 - Procedures for Managing Automatic Data Processing Systems; Volume I - Documentation, Development, Acquisition and Implementation, dated September 12, 1977, and Volume II - ADPS Management, dated September 2, 1977.

AFR 300-12 provides the procedures for managing ADPs. It defines the requirements for documentation, milestone reporting, and hardware and software acquisition management. Volume I applies to all ADPSs and ADPS elements within the purview of AFR 300-2, and Volume II identifies USAF ADPS managers for standard ADPS and presents specific management functions and procedures for governing individual ADPSs.

AFR 300-15 - Automated Data System Project Management, dated January 16, 1978.

AFR 300-15 defines and outlines the methodology for managing automated data system (ADS) projects. It provides guidance on organizing, planning, developing and maintaining an ADS. It describes the configuration management, review and reporting, quality assurance, and test management procedures to be followed in an ADS acquisition.

AFR 800-2 - Acquisition Management Acquisition Program Management, dated November 14, 1977.

AFR 800-2 implements DODD 5000.1 and DODI 5000.2 and states the policies for managing all Air Force acquisition and modification programs funded either through procurement appropriations, through the Security Assistance Program, or through the RDT&E appropriation. It specifies the roles and responsibilities for managing major system acquisitions within the Air Force.

AFR 800-14 - Volume I: Management of Computer Resources in Systems, dated September 12, 1975, and Volume II: Acquisition and Support Procedures for Computer Resources in Systems, dated September 26, 1975.

AFR 800-14 establishes policy for the acquisition and support of computer equipment and computer programs employed as dedicated elements, subsystems or components of systems defined under AFR 800-2. Though AFR 800-14 was published prior to DODD 5000.29, it embodies the DOD policies set forth in the latter.

(2) The Federal ADP Management Structure Is Comprised of a Number of Organizations Which Are Responsible for Policy Development and Implementation, and ADP Oversight Management

In addition to the intricate network of laws, circulars, directives and regulations governing the process, there exists an equally elaborate organizational structure. There are numerous organizations in the ADP acquisition hierarchy that interact with one another in the development and implementation of policy. Each organization wields formal influence through defined roles and prescribed authority, while some wield greater informal influence in the practical functioning of the process. These organizations, which direct and control the user agencies' attempts to fulfill their ADP requirements, are interdependent in carrying out the Federal ADP Program.

The organizations forming the regulatory environment include:

- Congressional Committees
- Office of Management and Budget (OMB)
- General Services Administration (GSA)
- Department of Commerce, National Bureau of Standards
- Assistant Secretary of Defense (Comptroller) (ASD(C))
- Office of the Secretary of the Air Force.

Each organization is discussed in detail in the following paragraphs.

1. Congressional Committees Influence ADP Acquisition Through Legislative Development, Interpretation, and Oversight

Congress has broad legislative and oversight authority over the functions of the Federal agencies and departments. Specific committees are assigned responsibilities in monitoring selected activities. These committees exert their influence not only through the passage of legislation, but also through subsequent interpretation and oversight management. In ADP acquisition, problems have arisen due to varying interpretations by the relevant committees and the resultant issuance of contradictory committee guidance. Implementing agencies have attempted to respond to the conflicting direction, but have not always been able to act in accordance with the committees' intent. Perceiving deficiencies in performance, some committees have intervened in ADP acquisition and management.

The key committees influencing the Air Force ADP acquisition process are:

- The House Government Operations Committee (HGOC)
- Senate Committee on Governmental Affairs (SCOGA)
- House and Senate Appropriations Committees (HAC and SAC)
- House and Senate Armed Services Committees (HASC and SASC).

OMB, GSA, OFPP, OSD and the military departments must interface with these committees in carrying out ADP programs. Major policy and guidance must be submitted by executive agencies for committee review; budgeted programs must be submitted for authorizations and appropriations. ADP acquisitions are reviewed in connection with the implementation of PL 89-306 and the oversight of OMB's and GSA's ADP activities. The committees communicate their philosophies, recommendations, and instructions in the course of their policy making, budgeting, and review activities through committee reports.

Congress has become increasingly involved in ADP acquisition and management since the passage of the Brooks Bill. The congressional interest

that spawned this legislation was largely a result of numerous GAO reports documenting problems in ADP and calling for centralized management. Since PL 89-306, GAO has not diminished its efforts, but has continually reminded Congress of the ineffective implementation of the law through the issuance of at least 200 separate reports. Tensions between the legislative branch and the executive branch agencies charged with PL 89-306 implementation have mounted to the point that the HGOC's involvement has been termed "interference" which impedes executive branch decision-making (see ref. 2 p. 3 and ref. 3 p. 51).

HGOC has become the de facto manager of ADP acquisition, exercising their influence through the GSA APR mechanism, often creating delays and frustration by requesting holds on acquisitions late in the cycle. Congress believes its extensive scrutiny and oversight are warranted in the face of abdication of responsibility by OMB, GSA, and the DOC, and the failure of agencies to effectively manage the ADP resource.

The HGOC and the HAC have disagreed on the optimum method to achieve the P.L. 89-306 goals of economy and efficiency in acquisition of ADP. This conflict has resulted in contradictory direction to the user agencies, and subsequent confusion. The HGOC has stressed the achievement of maximum hardware competition, the HAC has focused on the achievement of lowest total cost over the system's life cycle. Recently, in the FY 1982 DOD Authorizations Report, the SASC expressed its intention that the DOD should acquire ADP, taking account of lowest total overall cost to the maximum extent feasible.

There is no doubt that Congressional involvement will continue until the agencies have demonstrated their management competence to the satisfaction of Congress.

2. <u>OMB Has Broad ADP Policy and Fiscal Authority as Well as Oversight Responsibility</u>

As a cabinet-level component of the executive branch, OMB is responsible for fiscal policy and general administrative management. In the ADP arena, OMB has been assigned specific responsibilities under PL 89-306, and these have recently been reaffirmed under PL 96-511, the Paperwork Reduction Act of 1980. However, over

the years, policy roles have shifted between OMB and GSA, creating considerable confusion in the ADP community and hampering both agencies in the fulfillment of their prescribed roles.

OMB's policy and fiscal authority has generally been communicated through the issuance of OMB circulars. OMB first instituted a program designed to achieve better management of ADP technology within the Federal Government through centralized leadership in 1959, and administered this program through issuance of circulars and bulletins until the passage of PL 89-306 in October 1965.

By that time there had been dramatic increases in the use and cost of ADPE. These factors, in conjunction with at least 100 GAO reports in the previous decade, aroused the interest of Congress, specifically the Chairman of the HGOC. The legislative result was PL 89-306, which emanated from the Brooks Bill (HR 4845) and passed Congress as an amendment to the Federal Property and Administrative Services Act of 1949.

The Brooks Bill conferred "fiscal and policy control" (PL 89-306) authority upon OMB (then the Bureau of the Budget). While the law incorporated most of the provisions of earlier OMB circulars, it failed to amplify the role of OMB, focusing primarily on GSA's role. In contrast, Circular A-71 had outlined a broad role for OMB as the lead executive branch agency with responsibility to "provide overall leadership and coordination of executive branch-wide activities pertaining to the management of automatic data processing equipment and related resources... develop programs and issue instructions...for the selection, acquisition and utilization" of ADP (BOB Circular A-71).

While PL 89-306 was intended to enable GSA to exercise government-wide authority in the area of procurement policy, and develop regulations to assure government-wide compliance, its ambiguous delineation of GSA's role vis-a-vis OMB's,in developing "government-wide policies for improving the management" of procurement (1949 Act), has detracted from the effective performance of both organizations.

In 1973, Executive Order 11717 effectively divested OMB of its policy control functions with respect to automatic data processing, leaving intact OMB's fiscal and oversight responsibilities, by shifting the policy functions to GSA. OMB functions related to the establishment of standards were assigned to the Department of Commerce. The apparent intent of the order was to reinforce GSA's "overall leadership" role, as defined in the 1949 Act and subsequent amendments, in developing government-wide policy for ADP. While OMB was not relieved of its policy oversight and formulation responsibilities, the EO nonetheless appeared to expand GSA's role as an ADP regulatory authority in relation to OMB.

Meanwhile, OMB had acted in a way so as to enhance the perception of its diminishing authority in the ADP area. OMB ceased the issuance of major ADP policy guidance subsequent to Circular A-71 in 1965. In response to the enactment of PL 89-306, OMB in 1966 provided "guidance" to GSA and NBS with respect to the provisions of the Act.

In 1975, certain policy functions that had been transferred to GSA under Executive Order 11717 were transferred back to OMB under Executive Order 11893. ADP policy authority, however, remained with GSA. Neither this 1975 EO nor its 1973 predecessor clarified the extent of GSA's role in "developing" policy based on OMB's "formulation," in the terminology of a Justice Department decision related to EO 11717.

Until 1975, ADP policy oversight responsibility within OMB resided in the Information Systems Policy Division. After the creation of OFPP in 1975, the relative roles of OFPP and OMB Information Systems Policy Division were unclear. The Office of Federal Procurement Policy (OFPP) was established within OMB pursuant to PL 93-400, which mandated that OFPP "provide overall direction of procurement policies, regulations, procedures, and forms" (PL 93-400). OFPP was created in response to recommendations of the Commission on Government Procurement (COGP), which specifically and urgently suggested "immediate consideration" by the President, and establishment by law, of a "central Office of Federal Procurement Policy in the Executive Office of the President, preferably within the Office of Management and Budget," to exercise "leadership toward effective management of the procurement function" (Summary of COGP, p. 5-6).

The Commission noted that the Office "should be independent of any agency with procuring responsibility, operate on a plane above the procurement agencies, ... have directive rather than merely advisory authority" (COGP, p. 5) and should have "responsibility for policies" related to acquisition (COGP, p. 71). These descriptions of OFPP's role in "exercising leadership" (COGP) and providing "overall direction to procurement policies" (PL 93-400) are strikingly similar to the role described for GSA in the 1949 Act and subsequent amendments (including PL 89-306).

This has posed some questions as to OFPP's role in relation to GSA/ADTS, concerning ADP acquisition. However, OFPP has conceded, in its UPS proposal to Congress in October, 1980, that ADP acquisition procedures are "unique." While it is not entirely clear, it would appear that ADP acquisition policy is the responsibility of GSA/ADTS as per P.L. 89-306 and E.O. 11717.

Most recently, PL 96-511, the Paperwork Reduction Act of 1980, yet to be implemented, states that the Director of OMB "shall develop and implement Federal information policies, principles, standards, and guidelines, and shall provide direction and oversee ... the acquisition and use of automatic data processing, telecommunications, and other technology for managing information resources." The ADP and telecommunications functions of the Director shall also include "monitoring the effectiveness of, and compliance with, directives," and providing "advice and guidance on the acquisition and use" of ADP and telecommunications equipment. This broad role in ADP policy development, implementation, and oversight is stated to be consistent with the authority conferred by PL 89-306, neither increasing nor decreasing the authority of GSA, OMB, or Commerce.

In hearings on the Paperwork Reduction Bill, the Senate expressed its intention not to expand GSA's ADP authority under P.L. 89-306, but rather to consolidate all policy-setting, coordination, and oversight related to information management in a clearly defined focal point, specifically, the Office of Information and Regulatory Affairs (OIRA) in OMB. Despite statutory provisions of authority to OMB, GSA has impacted Federal ADP acquisition policy in practice since the passage of the Brooks Bill.

3. GSA Has Played a Key Role and Exerted Considerable Influence on the Development and Implementation of Both Procurement and ADP Policy

The General Services Administration (GSA) has broad policy and operational authority over the acquisition and management of government property and services. GSA's influence in the ADP acquisition environment has been expanded through statute, executive and legislative branch intervention, and through the assumption of responsibilities seemingly abdicated by OMB since 1965.

GSA was established in 1949 largely on recommendations of the Hoover Commission. The Federal Property and Administrative Services Act of 1949 implemented the Hoover Commission's recommendation for an independent general services agency, designating that GSA should "provide for the Government an economical and efficient system for (a) the procurement and supply of personal property and nonpersonal services ...; (b) the utilization of available property; (c) the disposal of surplus property; and (d) records management." (Fed. Property Administration Services Act of 1949, Sec. 2.) The Administrator was given the power to prescribe policies and methods and wide latitude in determining which functions should be performed by GSA and which should be delegated.

BOB Circular A-71 defined GSA's responsibility in the administration and management of ADP activities as "aiding in the achievement of increased cost effectiveness in the selection, acquisition and utilization" of ADP. OMB's intent was to charge GSA with "providing for control of Federal equipment acquisition costs and equipment proliferation and duplication," but not to involve the Administration in "the effective utilization of operating agency ADP resources once they were acquired" (see ref. 3).

In 1965, PL 89-306 authorized the Administrator to "coordinate and provide for the economic and efficient purchase, lease, and maintenance" of ADP, subject to the fiscal and policy control of OMB. Congress appears to have envisioned the achievement of economy and efficiency through centralization of management within GSA and the provision by the agency of technical expertise lacking in the user agencies.

GSA's role under PL 96-511 is one of an operational manager subject to OMB's direction. While a central management role in information resources is stressed, the Senate language in the bill, and the specific wording in the law, disclaim an expansion of GSA's authority, as defined in PL 89-306. There is some hesitancy (understandable in view of past events) to accept this disclaimer for fear that an excessively broad interpretation and implementation could effectively expand GSA's authority.

GSA communicates its policy primarily through two series of regulations. The Federal Property Management Regulations (FPMR) apply to all government departments, including DOD. GSA ADP policy was initially published in Part 101.32 of the FPMR. In 1974, FMC 74-5 consolidated ADP policy into one directive, and became the principal implementing document for PL 89-306. The tenets of FMC 74-5 provided the basis for current procurement regulations and procedures.

Subsequently, a subpart added to the FPR in October 1976 set forth policies and procedures governing the procurement of all ADP, including by DOD (GSA FPR Subpart 1-4.11). This resulted in the coexistence of two overlapping bodies of Federal ADP issuances originating within GSA, in addition to the DAR, which has created a good deal of confusion. A notable inconsistency is the definition of competitive vs non-competitive procurements. The presence of adequate price competition qualifies as competitive with commodities other than ADP in the FPR, and in the DAR. However, the DAR must comply with the FPR provisions regarding ADP acquisition, and the FPR defines a requirement for ADP as non-competitive or solesource "not withstanding adequate price competition," if it is based on specific make or model specifications.

Within GSA, the Automated Data and Telecommunications Service (ADTS) is authorized to perform GSA's ADP functions under the Brooks Bill, as amended. ADTS was established within GSA by Administrative Order on August 15, 1972, combining the ADP functions of the Federal Supply Service with the telecommunications functions of the Transportation and Communications Service. The order tasked ADTS with "the direction and coordination of a comprehensive government-wide program

for the management, procurement, and utilization of automatic data processing and communications equipment and services" (see ref. 4 pp. 3-15).

GSA's ADP acquisition activities, as directed by ADTS, have been closely monitored by the House Government Operations Committee (HGOC). HGOC maintains that this extensive oversight is warranted, whereas the dissenting view is that this intervention into ADTS daily decision-making is "impeding Executive Branch management with few commensurate benefits" (GSA Eval.). In any case, it is clear that the HGOC has exercised considerable influence in its oversight role, regardless of its lack of statutory authority over the procurement process. This is evidenced by the fact that "there is no recollection of GSA proceeding with a delegation or with one of its own procurements over the opposition of Government Operations Committee" (see ref. 3 p. 50).

Additionally, ADTS has never exercised the authoritative leadership role envisioned by the Brooks Bill, and ADTS relations with customer agencies have been fraught with conflict. The center of ADP technical and procurement expertise has not been developed. The length of time required to obtain a DPA from ADTS for equipment procurement has been cited as a cause of technological lag in the dynamic field of ADP (GSA Eval. p. 63).

Within ADTS, the management of ADP and telecommunications has been carried out separately, despite the increasing technological merger of these two fields. Fragmentation of organizational responsibility among a variety of relatively independent elements has resulted in "unnecessary duplications, inefficiencies, and a lack of coordinated approach" (GSA Eval. p. 61). ADP policy groups reside within the ADTS Office of Agency Assistance, Planning, and Policy and at a branch level within the Procurement Division of the Office of Automated Data Management Services.

In 1973, when EO 11717 increased the scope and complexity of GSA's management functions, the Office of Federal Management Policy (OFMP) was established to assume the policy functions transferred from OMB. Five subordinate offices focused on the functional areas of procurement, property, ADP, financial and management systems. While OFMP was disbanded in response to the EO 11893 retraction of most of the functions that

had been shifted from OMB, a small ADP policy group remained to exercise the ADP functions that the latter EO had not affected. The responsibilities of this ADP Management Policy and Planning Function were never clearly defined.

GSA has been heavily criticized for its inability to cope with its dual procurement and ADP responsibilities. Since the delineation of authority between OMB and GSA has been vague, there has been a lack of centralized policy direction and planning coordination. In addition, GSA has interpreted FMC 74-5 very narrowly concerning software conversions, reflecting the influence of the HGOC. Although the circular states that conversion costs are a consideration, GSA's interpretation has precluded the consideration of all of the costs that need to be included in the analysis in order to achieve lowest total overall cost (LTOC) in acquisition.

The practical focus has been on maximizing competition in order to achieve the lowest hardware cost, an objective which is not always synonymous with the achievement of the lowest cost over the system's life cycle. This position has created problems for user agencies who, as a result, must orient their Agency Procurement Requests (APR) so as to ensure maximum free and open competition, whether or not this achieves LTOC. An opposing viewpoint is advocated by the HAC; they reject the argument that maximum hardware competition will ensure optimal economy and efficiency, and assert that the agencies should strive for LTOC. The SASC has recently expressed its support for the HAC position in the FY82 Authorizations Report.

Recently there has been progress in relation to DOD efforts to free the Department from GSA regulatory involvement in the fulfillment of its mission. The SASC has recommended statutory language which insures that regulations governing DOD ADP acquisition for critical defense missions are limited to those applying to other DOD procurement under Title 10 of the U.S. Code. The amendment to Section 2315 USC Title 10 states that no other provisions of law shall be applicable to DOD ADP procurement if the function, operation, or use of such ADPE or services involves intelligence, cryptologic, or command and control activities, is integral to a weapon system or is critical to direct fulfillment of

military or intelligence missions. This exclusion effectively removes these categories of ADP from the requirements of PL 89-306, and is consistent with the exclusions in PL 96-511.

GSA has made recent efforts toward improving its performance and facilitating the smoother functioning of the ADP acquisition process. Changes have been made in the FPR's and FRMR's Subchapter F which "represent a major step toward computer acquisitions at lowest total overall cost" (see ref. 5). Revisions include a clarification of lowest overall cost to include conversion, a definition of competitive procurements that allows for "maximum practicable" versus the more restrictive "full" competition, and substantial increases in agency procurement authority for ADPE under competition.

Additionally, there have been organizational changes within ADTS, including the creation of an Office of Planning and Policy to manage both ADP and telecommunications. The organization is "committed to accenting its regulatory role and strengthening its management areas," and there has been a significant effort to delegate procurement authority in more instances (see ref. 3 p. 64).

4. The Secretary of Commerce Provides Federal Agencies With Scientific and Technological ADP Advisory Services

The Secretary of Commerce was assigned a role in the administration of the Federal ADP Program by OMB Circular A-71 in 1965. A very similar role was legislated for Commerce under PL 89-306 to improve the utilization and effectiveness of computer systems. In 1973, EO 11717 transferred to the Secretary all functions of OMB related to the establishment of government-wide ADP standards, including their approval on behalf of the President.

The Department of Commerce, National Bureau of Standards (NBS), is responsible for the Federal Information Processing Standards (FIPS) Program. This role for NBS involves the development and issuance of standards related to ADP equipment, techniques, and computer languages, among other subjects, some of which have constrained the efficient acquisition of ADP. NBS, through

its Institute for Computer Sciences and Technology, provides leadership, technical guidance, and coordination of government efforts in the development of technical guidelines and standards for computer systems.

5. ASD(C) Interprets and Implements Federal ADP Policy for DOD

DOD Directive 5100.40 establishes the DOD ADP Program and assigns responsibility for the ADP Program pursuant to OMB Circular A-71. The Assistant Secretary of Defense (Comptroller), (ASD(C)), was assigned responsibility for administration, with delegation within ASD(C) to the Directorate of Data Automation (DDA). DDA is an organization within the Office of the Deputy Assistant Secretary (Management Systems) established in response to the PL 89-306 and OMB A-71 requirement for an ADP policy and management focal point with each agency. DDA is not a major influence in ADP acquisitions since its specified functions do not include a direct role in the acquisition and approval process.

DDA integrates and implements Federal ADP policy through the issuance of policy and directives applicable to OSD, JCS, military departments, the defense agencies, and the unified and specified commands. DDA oversees the implementation of policies and plans within the DOD ADP Program and monitors major ADP system development projects.

While it has minimal formal influence over military departments' acquisitions, the Directorate functions as a central point of contact within DOD, where problems among the departments or between DOD and GSA, OMB, or congressional committees can be resolved. This role is implemented by DOD Directive 4105.55. The functions of DDA are performed by three independent teams with total staffing of 12 individuals. DDA's problems in responding to conflicting executive and legislative ADP policy direction are discussed in the Conclusions, Chapter IV.

6. Assistant Secretaries of the Air Force Exercise the Statutory Authority Assigned and Delegated by the Secretary

The Secretary of the Air Force, pursuant to 10 U.S.C. 8012, is responsible for and has the authority necessary to conduct all affairs of the

Department of the Air Force. Subject to his control, the Under Secretary and the Assistant Secretaries of the Air Force are authorized to act for and with the authority of the Secretary of the Air Force in matters within the areas assigned. The specific functions for these individuals are detailed in Secretary of the Air Force Order 100.1. The two Secretaries of the Air Force (SAF) discussed in connection with ADP are the following:

- Assistant SAF for Acquisition and Logistics
- Assistant SAF for Financial Management.

The Assistant Secretary for Acquisition and Logistics (SAF/AL) is the Air Force Acquisition Executive. He exercises that authority in the areas of research and development, weapons and weapons systems development, test, evaluation, production and contract management, procurement activities, and supply matters. While management authority for the Air Force ADP Program has been delegated by the SAF to SAF/FM (as discussed below) contracting authority for ADP remains with SAF/AL.

The Assistant Secretary of the Air Force for Financial Management (SAF/FM) is the Air Force Senior ADP Policy Official and is responsible for the overall policy, management, and administration of the Department's ADP program; this is in addition to his overall responsibilities for Air Force budgeting and finance. His ADP responsibilities include the selection, acquisition, management, and use of automatic data processing equipment and associated software (ADPE/S). The SAF/FM has been delegated the authority to approve ADP projects, ADP specification, and expenditure of ADP resources.* He also is the source selection authority for ADP acquisitions. He may, however, choose to delegate this authority. Authority to contract for ADP and to issue policy direction governing this authority is delegated through SAF/AL to the Air Staff, and may be further delegated from there.

* Major system acquisitions, as determined under DOD Directive 5000.1, will be processed in accordance with that directive.

The SAF/FM has been appointed Senior IRM Official under the requirements of PL 96-511.

2. PROCESS DESCRIPTION IS PRESENTED IN TERMS OF THE PARTICIPANTS AND THEIR ACTIVITIES

This section of the report presents a description of the Air Force ADP Acquisition Process, and outlines it in terms of the specific activities which must be accomplished, the relationship and sequence of those activities, and the participating organizations. The primary source is the Air Force 300-Series Regulations including:

- AFR 300-2 Managing the USAF Automated Data Processing Program, dated 24 April 1980
- AFR 300-7 Automatic Data Processing (ADP) Planning, dated 11 February 1977
- AFR 300-12 Procedures for Managing Data Processing Systems (ADPS) Volume I Documentation, Development, Acquisition, and Implementation, dated 12 September 1977; and Volume II ADPS Management, dated 24 April 1980
- AFR 300-15 Automated Data System Project Management, dated 16 January 1978.

The ADP Acquisition Process is described in terms of:

- Its Scope
- The Organizational Participants
- The Process Steps
- Processing Thresholds
- Management of the ADP Program.

These elements are discussed in detail in the remainder of this chapter.

(1) The AF 300 Series Acquisition Process Encompasses All General-Purpose ADP Resources Except Those Acquired in Combat Weapons Systems and Specially Designed Equipment

In order to understand the scope of the ADP Acquisition Process, it is necessary to define a number of terms. The following definitions are taken from 300-2 (unless otherwise noted):

- USAF ADP Program - The sum of all objectives, plans, policies, directives, procedures, and criteria establishing and pertaining to:

- The acquisition, use, and management of ADP resources.

- The design, development, control, improvement, and standardization of automated data systems.

. ADP Resources - The totality of ADPE, software, computer programs, ADP contractual services, ADP personnel, and supplies.

. Automatic Data Processing Equipment (ADPE) - General purpose, commercially available ADP components and systems created from them which were not specially designed (as opposed to configured) for any specific application.

. Combat Weapons System - An instrument of combat, either offensive or defensive, used to destroy, injure, or threaten the enemy.

. Commercially Available (see ref. 6) - Offered for sale to the general public and/or industry at established catalog or market prices.

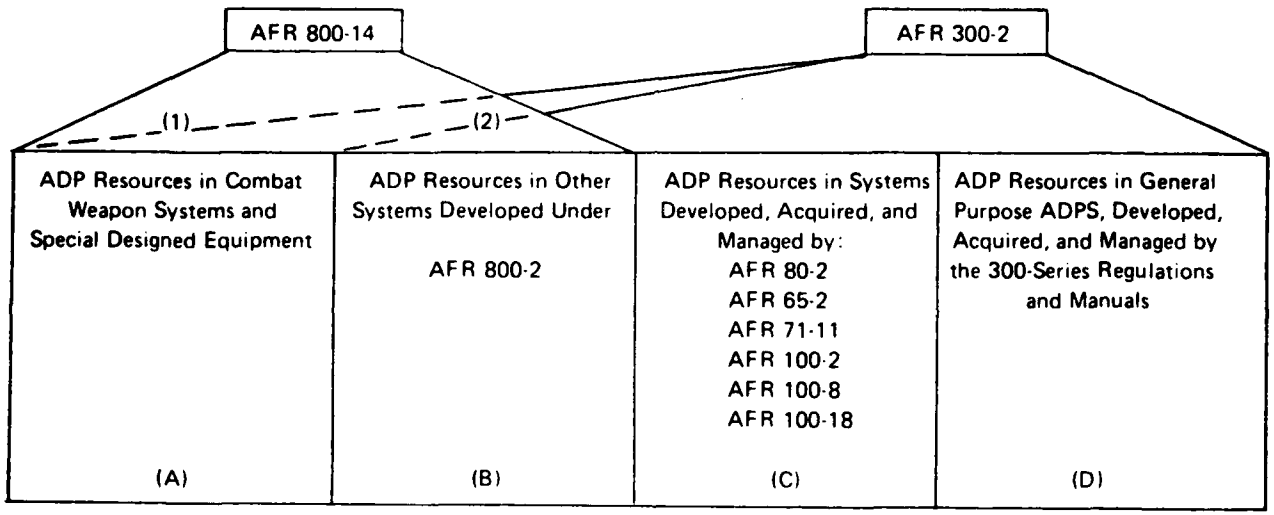
. Specially Designed (see ref. 6) - Government specified and not commercially available. Excludes specially configured.

. Acquisition Program (see ref. 6) - A directed effort funded either through procurement appropriations, through the Security Assistance Program, or through the Research, Development, Test and Evaluation appropriation with the goal of providing new or improved capability in response to a validated need. Excluded from this definition are general purpose, commercially available ADP assets.

A major source of confusion is in the decision to apply AFR 300-2 or AFR 800-14 procedures to the management of acquisition programs. The possibility for confusion is depicted by the overlap illustrated in AFR 300-2, Attachment 4, shown in Figure II-2. As an example, AFR 300-2 does not apply to computer equipment which is "integral to or in direct support" of combat weapons systems; however, according to AFR 800-14, Volume II, paragraph 1-7, ADP resources in systems acquired under AFR 800-2 may be subject to

FIGURE II- 2

APPLICATION OF POLICY GUIDANCE TO MANAGEMENT
OF ADP AND COMPUTER RESOURCES



Category A—These items are exempt from the DOD and Air Force ADP programs. They are subject to the policies of AFR 800-14.

Category B—The ADP resources integral to these systems are subject to policies of AFRs 800-14 and 300-2.

Category C—Management of the ADP resources in these systems is subject to AFR 300-2 and the cited regulations. As these ADP resources are dedicated to the systems they support, primary management stems from the basic regulation governing the system.

Category D—These systems are developed, acquired, operated, and managed under the AF 300 series of directives.

(1) AFR 300-2 applies to Category A only for technical and managerial expertise, which the ADP program single manager's organizations will provide by review, consultation, recommendation, and HQ USAF coordination.

(2) The PMD specifies which policy requirements in AFR 300-2 are applicable.

AFR 300-2 procedures to the extent specified in the PMD. The source of guidance for making the decision to be included in the PMD is unclear.

(2) The Senior ADP Policy Official for the Air Force Is the Secretary of the Air Force for Financial Management

The Air Force ADP Management Structure, depicted in Figure II-3, is under the policy direction of the Secretary of the Air Force for Financial Management. AFR 300-2 outlines the mission of the organizations which support the AF ADP Program. These organizations are described in the paragraphs that follow.

1. AF ADP Program Single Manager Is the Director of Computer Resources (USAF/ACD)

Under the direction of the Comptroller of the Air Force, the AF ADP Program Single Manager has been delegated management authority for the Air Force ADP Program. As single manager, the Director of Computer Resources is responsible for:

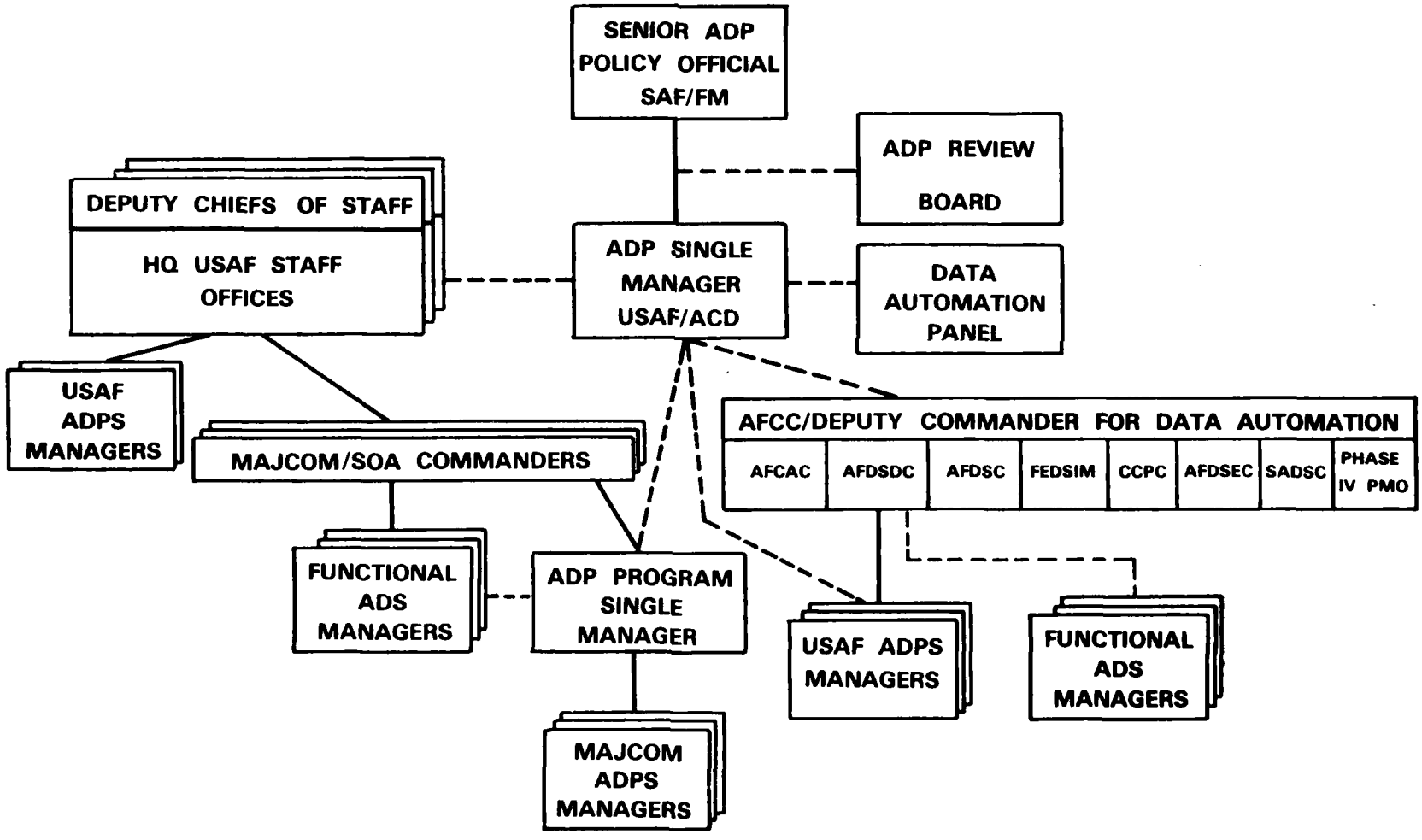
- Developing, coordinating and issuing plans, policy guidance, and procedures governing the ADP Program
- Planning, programming and budgeting of Air Force ADP resources
- Reviewing and approving Data Automation Requirements, and directing and monitoring ADP acquisitions
- Performing liaison for the Air Force with GSA and other Federal Government authorities relative to ADP procurements
- Providing ADP technological expertise to the Air Force.

2. Hq USAF Staff Offices Have the Functional Area Responsibilities Under the Deputy and Assistant Chiefs of Staff

Staff offices are located in the following organizations:

FIGURE II - 3

AIR FORCE PROGRAM ORGANIZATION



- USAF/RD - Research, Development and Acquisition
- USAF/XO - Operations, Plans and Readiness
- USAF/IN - Intelligence
- USAF/MP - Manpower and Personnel
- USAF/PA - Programs and Evaluation
- USAF/LE - Logistics and Engineering.

Functional staff offices have responsibility for developing, reviewing, staffing and validating functional requirements. In addition, some staff offices such as RD, LE and MP provide review, coordination and advice on ADP programs in other functional areas.

3. Major Commands (MAJCOM) and Separate Operating Agencies (SOA) Conduct the Studies and Analyses Which Must Accompany the DAR to Obtain Approval

To conform with these requirements the MAJCOMs and SOAs must possess expertise in two principal areas -- the functional area to which automation is being applied, and ADP. For this reason two separate management chains exist under the organization commander:

- ADP Program Single Manager provides ADP support for the command mission. The Office of the Single Manager provides support to the functional users in developing ADP requirements and is responsible for planning, acquiring, and maintaining ADP support.
- Functional ADS Managers provide the functional area expertise for the particular application(s) being automated. (An ADS (Automated Data System) is defined as an assembly of procedures, processes, methods, routines, or techniques specifically designed to make use of ADPE.)

4. USAF and Command ADPS Managers Are Appointed for Command-Unique and Standard ADPS

An ADPS (Automated Data Processing System) is defined as an aggregation of software and the resources required to support it (ADPE, manpower, and facilities). ADPS managers are appointed by the appropriate organizational level depending upon whether the system is command unique or USAF standard ADPS.

5. Air Force Communication Command (AFCC) Provides Specialized ADP Support Services

The Deputy Commander for Data Automation is responsible for managing AFCC resources to provide ADP support to Air Force activities. The subordinate elements of AFCC include:

- Air Force Computer Acquisition Center (AFCAC) is the central acquisition and selection office for the Air Force.
- Air Force Data Systems Design Center (AFDSDC) analyzes, designs, develops, tests, implements, and maintains ADPS's that are assigned to it by the Director of Computer Resources, HQ USAF. These include:
  - Base Level Data Automation Standardization Program
  - USAF MAJCOM ADP Program
  - Base Level Management System
  - Standard Base Supply System.
- Air Force Data Services Center (AFDSC) provides ADP services to the Air Staff, Office of the Secretary of the Air Force, Office of the Secretary of Defense, and other Federal Agencies.

- Federal Computer Performance Evaluation and Simulation Center (FEDSIM) develops and maintains programs, models, and techniques for simulating and analyzing ADP systems and equipment for all Federal agencies. The Air Force is the executive agent for GSA in operating FEDSIM.

- Communications Computer Programming Center (CCPC) provides computer programming services for the computers of the AUTODIN communications systems.

- Air Force Data Systems Evaluation Center (AFDSEC) provides independent quality assurance assessments of ADPS during the system life cycle.

- San Antonio Data Services Center (SADSC) provides ADP services for the San Antonio region and for any other government organization that can tie into the Center.

- Phase IV Program Management Office has program management responsibility for the ongoing acquisition of the system to replace the Secretariat Standard Base Supply System and the Base Level System. It also has been assigned program management responsibility for the Interservice Automatic Message Processing Equipment (IS/AMPE) program.

6. ADP Review Board Reviews the Air Force ADP Program and Advises the SAF/FM on Major ADP Policies and Projects

It is chaired by SAF/FM and composed of the other Assistant Secretaries, the General Counsel, the Comptroller of the Air Force, and the Director of Contracting and Acquisition Policy. The Director of Computer Resources is the Executive Secretary.

7. Data Automation Panel (DAP) - The DAP conducts the Air Staff Board Structure programming and budgeting review of the Air Force ADP Program.

(3) The ADP Acquisition Process Starts With the Identification of a Requirement for ADP and Ends With the Implementation of an Operational Capability

For clarity, it is useful to separate the process into the following phases:

- Requirement definition
- Requirement approval
- Technical specification development
- Procurement
- Installation and test.

These acquisition phases are discussed in the following paragraphs. For each phase, the specific activities are defined in terms of the information and documentation requirements, the decision processes, and the participating organizations. A flow chart of the generalized acquisition process, described in the AF 300-Series body of regulations, is depicted in Figure II-4 (see page II-38).

Requirement Definition Consists of the Identification, Definition, and Documentation of a Requirement by the Originating Organization

Specific activities included in this phase are:

- Defining the Functional Requirement
- Defining the ADP Requirement
- Conducting studies and analyses
- Preparing the Data Automation Requirement.

Requirements for ADP capabilities or services may originate at any organizational level within the Air Force. In order to proceed with an ADP development or acquisition program the functional requirement must be validated by the functional area authority and the ADP solution approved by the designated ADP approval authority. The vehicle for obtaining this approval is the Data Automation Requirement (DAR).

Before a DAR is initiated, the functional area specialists must establish the economic justification and feasibility of alternative solutions. If exploitation of automation is the selected alternative, the results of these analyses must be documented in the DAR.

Defining the ADP acquisition process required the establishment of a consistent starting point which could be traced from acquisition to acquisition. The time at which an ADP requirement is first defined would seem to be a logical point. However, there are difficulties in consistently identifying such an event.

Ideally, requirements for automation are defined as a normal part of the planning process and are documented two to seven years in advance. Requirements are documented in a Projected Automation Requirement (PAR), funds are approved, and work begins on establishing a program to acquire the ADP capability. In many cases, however, unplanned needs arise or existing needs change, causing the requirements generation and approval process to be accelerated. In some instances, ADP acquisitions are not traceable to a PAR, or if they are, the PAR is much broader, covering a greater number of ADP capabilities.

The second starting point considered was the preparation of the DAR. A DAR Package consists of the following documentation:

- Executive Summary of the DAR
- Data Automation Requirement (DAR)
- Statement of Requirements (if telecommunications support is required)
- Feasibility Study
- Economic Analysis
- Executive Justification Summary
- Draft Data Project Directive
- Draft Agency Procurement Request
- Statement of Work and GSA Form 2068
- ADP Telecommunications Requirements Checklist
- ADPE List and Sole Source Justification (if required)
- System Development Notification (if change to existing WWMCCS standard systems is required
- Software Conversion Study (if required).

The DAR documentation is initiated when the analyses of the originating organization clearly indicate that the requirement is mission essential, and that ADP resources are the most economical alternative solution. Once these analyses are complete, the results must be included in the DAR. Thus, it is difficult to ascertain precisely when the studies and analyses activity ends and when the DAR preparation activity begins.

Due to these difficulties, for the purpose of this study (and consistent with previous ones) the calculations of acquisition lead times started with the receipt of the DAR package at the Air Staff for processing and approval.

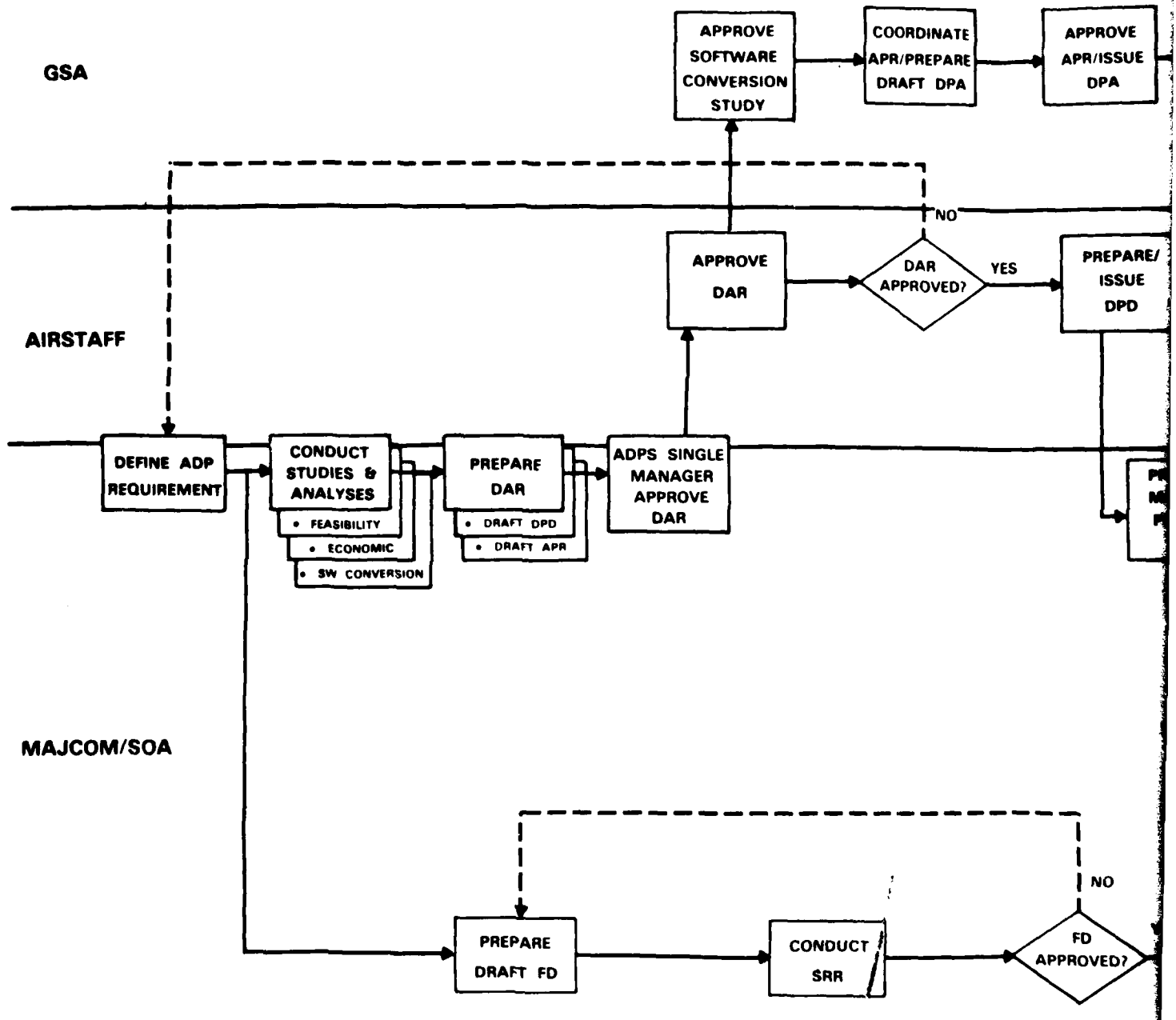
Requirement Approval Starts With The Staffing of the DAR Package at the MAJCOM or SOA ADP Program Single Manager

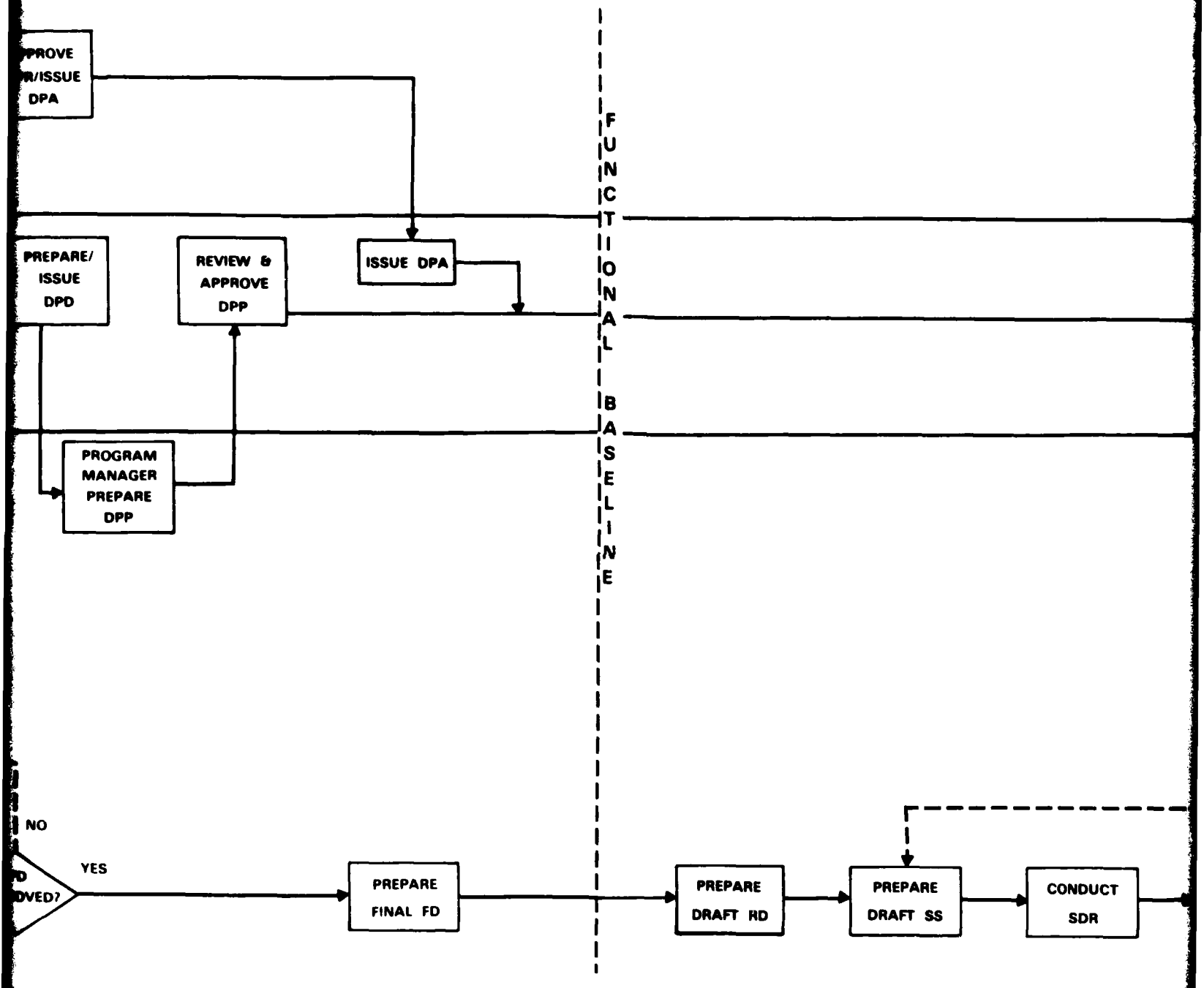
If the final approval authority is above the MAJCOM/SOA level, the DAR is submitted to the AF ADP Single Program Manager, USAF/ACD, for approval. Specific activities included in this phase are:

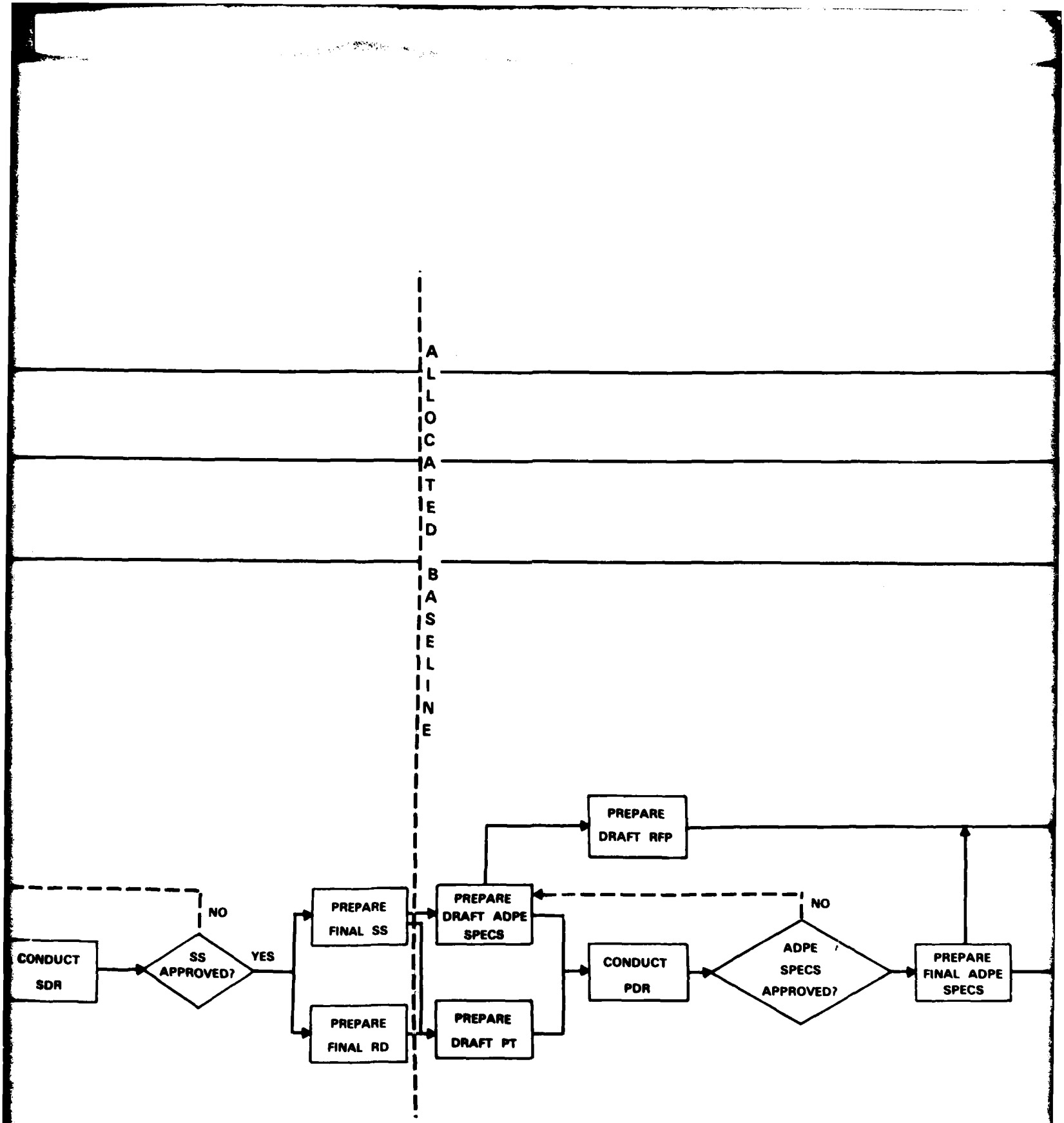
- Approve DAR
- Obtain Delegation of Procurement Authority (DPA)
- Issue Data Project Directive (DPD)
- Prepare/Coordinate Data Project Plan (DPP)

Upon receipt in USAF/ACD, the DAR package is assigned to an action officer for initial review. The action officer examines the package to ensure that it is properly formatted; that all reviews, certifications and coordinations have been completed; and that the DAR is consistent with AF plans and policies. If the DAR is deficient, either it will be returned to the originating office for reaccomplishment, or the action officer may request the originator to provide additional information and rework the package at the Air Staff.

Once the initial review is completed, the action officer removes the draft Agency Procurement Request (APR) (or the GSA Form 2068) and sends the remainder of the package to the Air Staff functional OPR for review, evaluation, and Air Staff coordination. The functional OPR validates the functional requirement and obtains coordination from the appropriate offices including:

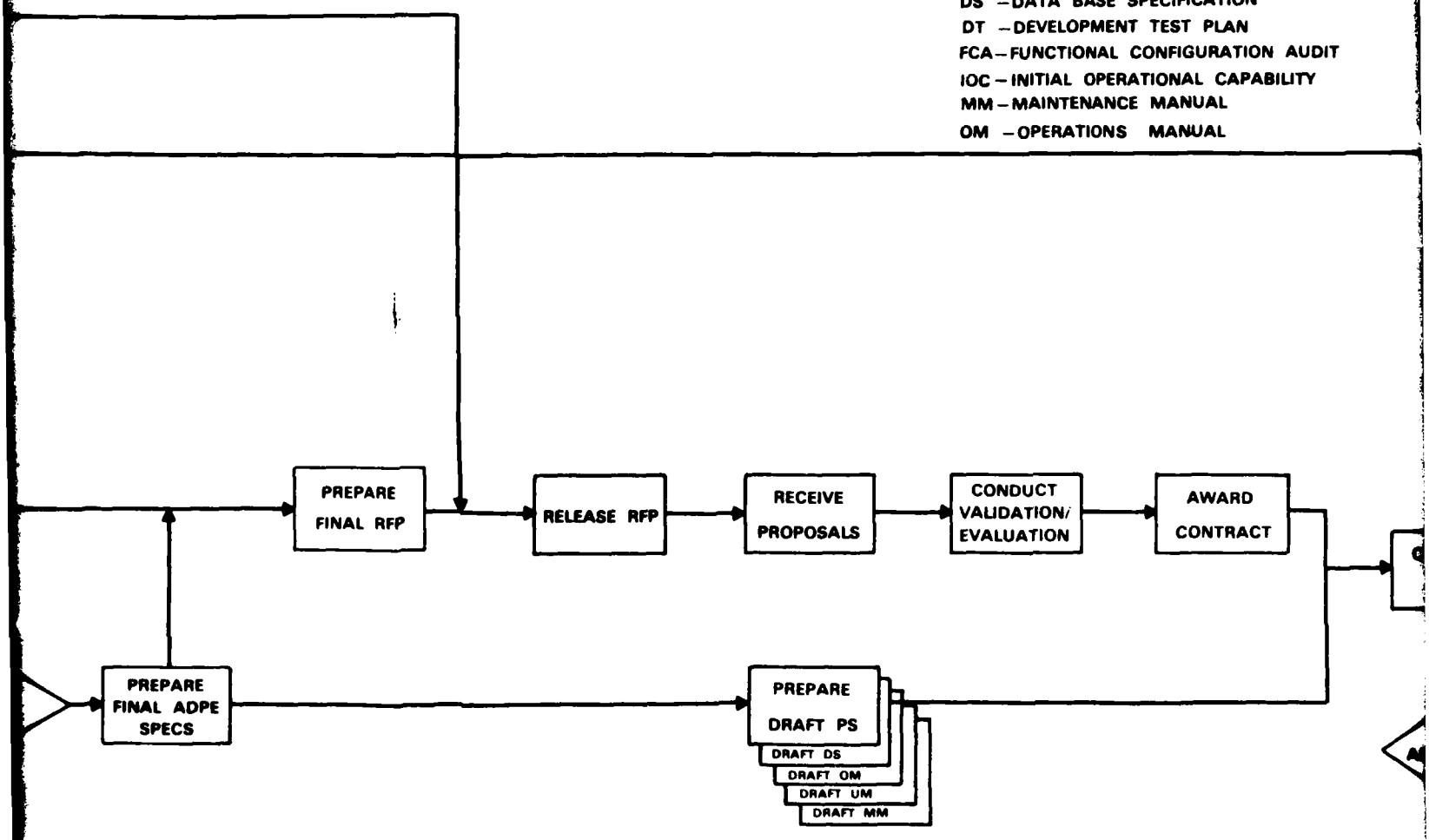

GSA
AIRSTAFF
MAJCOM/SOA
APPROVE SOFTWARE CONVERSION STUDY
COORDINATE APR/PREPARE DRAFT DPA
APPROVE APR/ISSUE DPA
NO
APPROVE DAR
DAR APPROVED?
YES
PREPARE/ ISSUE DPD
DEFINE ADP REQUIREMENT
CONDUCT STUDIES & ANALYSES
• FEASIBILITY
• ECONOMIC
• SW CONVERSION
PREPARE DAR
• DRAFT DPD
• DRAFT APR
ADPS SINGLE MANAGER APPROVE DAR
NO
PREPARE DRAFT FD
CONDUCT SRR
FD APPROVED?


PROVE
R/ISSUE
DPA
PREPARE/
ISSUE
DPD
REVIEW &
APPROVE
DPP
ISSUE DPA
FUNCTIONAL BASELINE
PROGRAM
MANAGER
PREPARE
DPP
NO
D
OVED?
YES
PREPARE
FINAL FD
PREPARE
DRAFT RD
PREPARE
DRAFT SS
CONDUCT
SDR


ALLOCATED BASELINE
PREPARE DRAFT RFP
NO
PREPARE FINAL SS
PREPARE DRAFT ADPE SPECS
NO
CONDUCT SDR
SS APPROVED?
YES
CONDUCT PDR
ADPE SPECS APPROVED?
PREPARE FINAL ADPE SPECS
PREPARE FINAL RD
PREPARE DRAFT PT

ABBREVIATION

APR – AGENCY PROCUREMENT REQUEST
CDR – CRITICAL DESIGN REVIEW
DAR – DATA AUTOMATION REQUIREMENT
DPD – DATA PROJECTIVE DIRECTIVE
DPP – DATA PROJECT PLAN
DS – DATA BASE SPECIFICATION
DT – DEVELOPMENT TEST PLAN
FCA – FUNCTIONAL CONFIGURATION AUDIT
IOC – INITIAL OPERATIONAL CAPABILITY
MM – MAINTENANCE MANUAL
OM – OPERATIONS MANUAL



FIGURE

ABBREVIATION LEGEND

QUEST
REMENT
VE
N AUDIT
BILITY

PCA – PHYSICAL CONFIGURATION AUDIT
PDR – PRELIMINARY DESIGN REVIEW
PS – PROGRAM SPECIFICATIONS
PT – TEST PLAN
PVR – PRODUCT VERIFICATION REVIEW
RD – DATA REQUIREMENT DOCUMENT
RFP – REQUEST FOR PROPOSAL
SRR – SYSTEM REQUIREMENT REVIEW
SS – SYSTEM SPECIFICATIONS
SVR – SYSTEM VALIDATION REVIEW
UM – USERS MANUAL

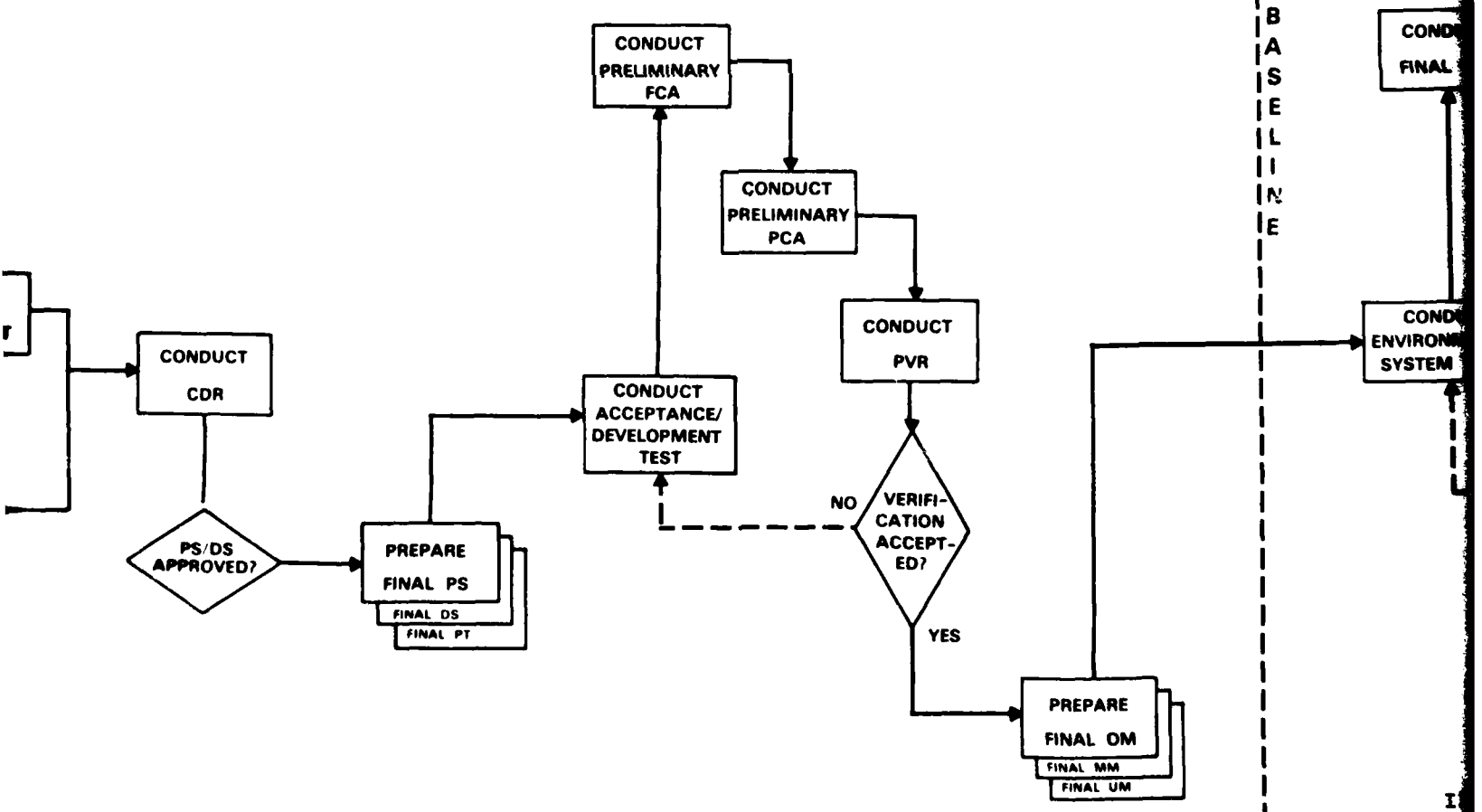
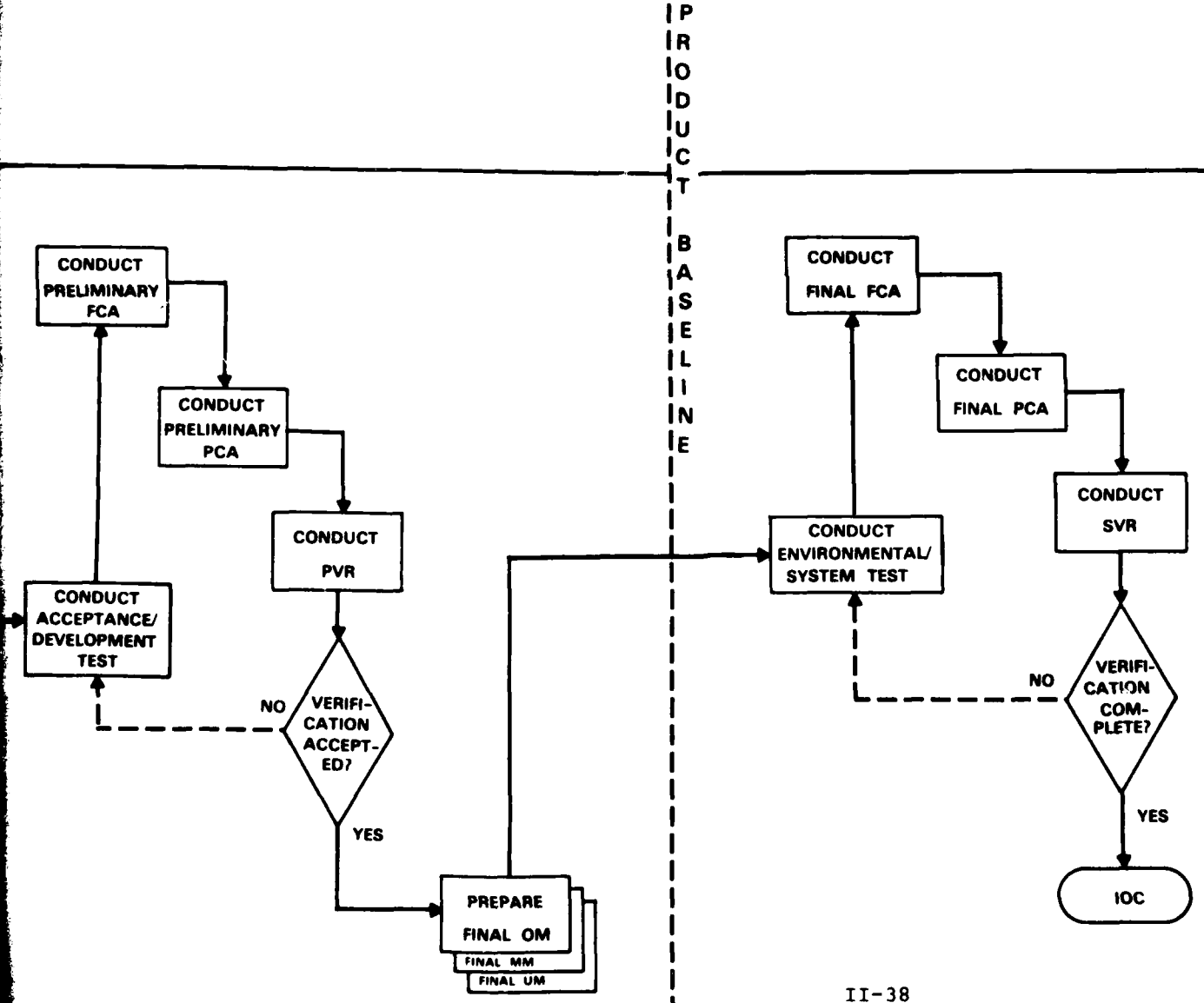


FIGURE II-4, ADP ACQUISITION PROCESS
WORK FLOW DIAGRAM



- Program Element Monitor(s)
- USAF ADPS Manager(s)
- USAF/ACDX-ADP Policy and Security
- USAF/ACDM or ACDS-ADP Technical Evaluation
- USAF/MPME-Manpower (if manpower resources, manpower benefits or contractor services are involved)
- USAF/ACMM-Management Analyses (for review of the Economic Analysis)
- USAF/XOKC - Communications, Command and Control (if there are associated communications requirements)
- USAF/XOKS - World wide Military Command and Control System (if WWMCCS SDN's are involved)
- USAF/DAAD(s) - Privacy Documentation
- USAF/MPPT - Formal or Contractor Provided Training
- USAF/LEXY - Logistics Policy and Procedures
- USAF/LEEP - Engineering Support
- USAF/IN - Intelligence Requirements
- USAF/RDCS - Contracting and Manufacturing Policy
- AFDSDC - Air Force Data Systems Design Center (if base level and WWMCCS related requirements are included)
- HQ AFCC/CDO - Headquarters Air Force Communications Command (DPD tasking to an AFCC ADP Center, if appropriate).

After the package is fully coordinated, recommended changes are received by the AF/ACD action officer from the functional OPR and they are resolved and incorporated into the final package by the action officer. The action officer then completes the DAR approval package which includes:

- Staff Summary Sheet - An executive summary of the action recommended, requesting USAF/ACD signature on the DPD or on the letter to SAF/FM, depending upon the approval authority.

- Executive Justification Summary - A synopsis of the DAR, usually six pages or fewer.

- Data Project Directive (DPD)

- Letter to SAF/FM requesting approval if the DAR is above the USAF/ACD approval threshold.

The DAR approval package must again be sent to the functional OPR to be reviewed by the same Air Staff offices that reviewed the DAR package. When completed, the approval package is returned to the action officer to present for signature. The DAR is approved either by the SAF/FM signing the approval letter, or by the Director of Computer Resources signing the DPD. If the SAF/FM is the approval authority, a Case Synopsis is prepared and presented in lieu of the Staff Summary Sheet.

DAR approval is signified by issuing a Data Project Directive (DPD) to the originating organization for the implementation of the required ADP resources. The DPD documents key decisions; assigns responsibilities for management, design, development and procurement; defines the project scope; and authorizes specific actions to be taken in satisfying ADP requirements approved in the DAR.

The first action required of the office assigned program management responsibility in the DPD is to prepare a Data Project Plan (DPP). The DPP describes the actions that must be taken to complete the project within the specified cost and schedule constraints and provides planning documentation to assist the project manager in the development, acquisition and implementation of ADP capabilities. Once prepared, the DPP is sent to the USAF/ACD action officer where it receives the same coordination as did the DAR package. When the Air Staff review and coordination is completed, the DPP is sent to the Director of Computer Resources for approval.

All Air Force Agency Procurement Requests (APR's) are processed through USAF/ACD regardless of the DAR approval authority. For those cases which are above the MAJCOM/SOA approval threshold, the APRs are

detached from the DAR package and processed concurrently with the DAR coordination to expedite the requirements approval process.

To process an APR, the USAF/ACD action officer must prepare a proposed synopsis of the APR and a transmittal letter for the Director's signature. This APR package must be coordinated with the following offices:

- USAF/ACDX - Policy and Procedures Group
- USAF/ACDR - Resource Management Division
- USAF/RDCS - Contracting and Manufacturing Policy.

Once reviewed and signed, the APR is sent to GSA for action. GSA, upon receipt, verifies that the package is complete and that all required studies, analyses and justifications have been accomplished. GSA will provide the House Government Operations Committee (HGOC) with a synopsis of each APR that has a high dollar value or which limits competition. Barring requests for additional information, GSA will issue a Delegation of Procurement Authority (DPA) to the Air Force. For those high priority APR's, the Air Staff may invoke the "20 day clock" under FPR 1-4.1105(b), which states that the requesting agency may assume that procurement authority has been delegated if no formal written direction to the contrary has been received within the 20-day period.

The DPA grants the Air Force the authority to acquire specific ADP resources. The USAF/ACD action officer reviews the DPA upon receipt from GSA. The original DPA remains part of the ACD case file and the action officer prepares a separate letter, redelegating the procurement authority to the requesting organization.

Technical Specification Development Defines the Requirement in Either Equipment or Functional Terms

AFR 300-12, Volume I, Chapter 4, and AFR 300-15 establish the procedures for managing ADPS/ADS development and modifications. The formal specification development process, shown in Figure II-4, is characterized by developing a series of different levels of specifications, conducting design reviews to approve each specification, and conducting configuration audits and verification reviews to test and accept the system.

Most ADP resource acquisitions do not undergo such a rigorous documentation process. Even at the AFDSDC, the process described by AFR 300-15 for ADS acquisition management is tailored to the specific tasks. Figure II-5 represents a more realistic view of the ADP acquisition process, as witnessed during the case study and Government survey tasks of the project. While the requirements definition and approval process remain the same as prescribed in AFR 300-2, the technical specification development process is simplified considerably.

In reality, the specification development process is driven by the DAR preparation. In order to functionally validate the requirements, the user must functionally describe those requirements prior to initiating the DAR. As the studies and analyses which must be documented in the DAR are developed, the user is forced from functionally specifying requirements to defining specific ADP solutions. Thus, by the time the DPD is issued, the user will often have prepared draft specifications which are oriented more towards equipment characteristics than towards functional requirements.

The next step is to convert these draft specifications into ones suitable for a Request for Proposal (RFP).

Procurement Begins the Process of Fulfilling the Need With the Required ADP Capability

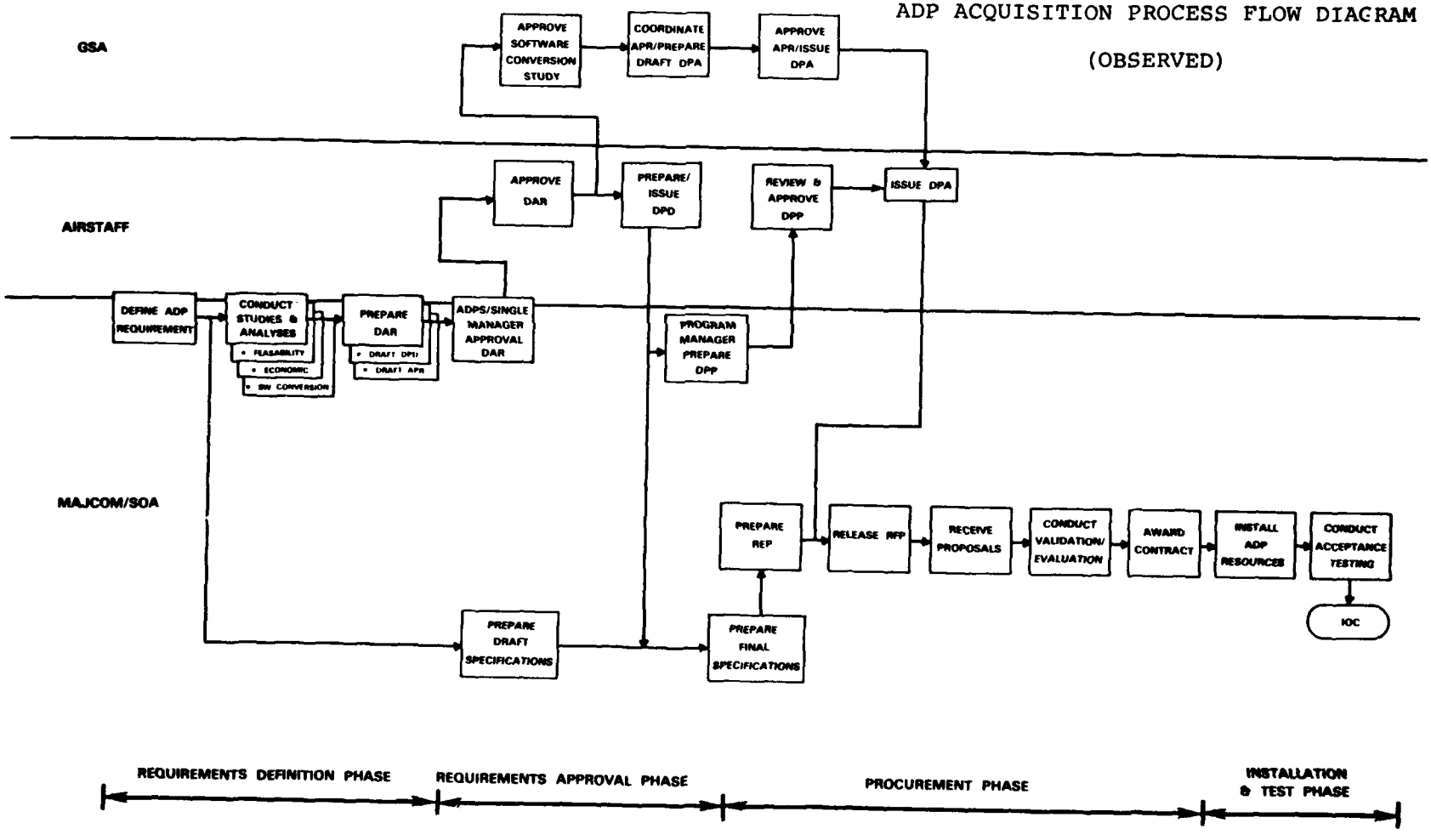
The Data Project Directive (DPD) establishes the office responsible for conducting the actual procurement of ADP resources. Large competitive procurements are usually assigned to AFCAC; however, procurements may be assigned to local contracting squadrons if they are determined to be capable of handling the particular procurement. The activities associated with the procurement phase are:

- Develop final specifications
- Develop RFP
- Issue RFP and receive proposals
- Evaluate proposals
- Negotiate and award contract.

FIGURE II - 5

ADP ACQUISITION PROCESS FLOW DIAGRAM

(OBSERVED)



In cases involving AFCAC, the first interchange between the user and procuring organization is usually not made until the DPD is issued. By this time, the user has developed draft specifications which are usually too restrictive and confining for the purposes of an RFP. Meetings are held between the user and the procurement organization to exchange technical information and to determine the appropriate level of detail to be specified in the RFP. At this point, a joint specification team is formed to prepare the final specification.

Besides the specification, additional materials are prepared in conjunction with the RFP; these include:

- Cost tables and cost evaluation models
- Acceptance test criteria
- Special and general provisions
- Data requirements
- Instructions to offerors
- Conditions and basis of award.

During this time letters of interest and notices for the Commerce Business Daily will be prepared to solicit competition.

The final step in the RFP development is to subject the RFP to internal reviews and independent procurement and legal reviews. Once completed, it is issued. Proposals are received and evaluated against the criteria established.

A competitive procurement is a lengthy process. The goal reported by AFCAC for completing a competitive procurement totals 15 months, which is broken down as follows:

- Specification Development 4.5 months
- RFP Development 3.0 months
- Proposal Development 3.0 months
- Proposal Evaluation 2.0 months
- Negotiation and Award 2.5 months.

Installation and Test Activities Conclude the Acquisition Process

As in the case of the Technical Specifications Development Phase, AFR 300-12 and 300-15 prescribe a number of reviews and audits to be conducted during the Installation and Test Phase. What is required during this phase of the acquisition process varies considerably depending on the resources being acquired and the complexity of the procurement. The level of

effort required is specified as part of the contract. General purpose equipment acquisitions usually require an installation and set-up period followed by a 30-day acceptance test with documentation requirements limited to what is commercially available from the successful vendor.

(4) Threshold Values Govern the Level of Approval Authority Required

The following individuals are authorized to approve various types of acquisition and procurement under the Air Force ADP program:

- The Air Force Senior ADP Policy Official (SAF/FM)
- The Air Force ADP Program Single Manager
- Major Command/Separate Operating Agency ADP Program Single Managers
- USAF ADPS Managers
- Command ADPS Managers, when the Major Command ADP program single manager delegates authority to them.

The Director of Computer Resources, AF/ACD, has been authorized by the Secretary of the Air Force to redelegate the approval authority granted to AF/ACD and those authorities have recently been redelegated by AF/ACD to the MAJCOM/SOA ADP program single managers and USAF ADPS managers. Table II-1 summarizes the approval authority thresholds for various types of acquisitions under the Air Force ADP program.

(5) The ADP Acquisition Process Is Part of Overall ADP Management Control, Which Includes the Planning, Programming and Budgeting System

Planning for ADP resources is the primary responsibility of the Resource Management Division of the Directorate of Computer Resources (AF/ACDR). ADP planning, as defined in AFR 300-7, Automatic Data Processing Planning, is accomplished through planning documents which are intended to integrate ADP planning with both the Air Force Planning, Programming, and Budgeting System (PPBS) as well as the ADP acquisition process. The ADP planning documents are addressed in the paragraphs that follow. Each is described in terms of its purpose and its relationship to the planning and acquisition process.

TABLE II-1

Air Force ADP Resource Approval Thresholds*

ADP Resource	MAJCOM/SOA, USAF ADPS MGR Approval Thresholds ($000)
ADPE (Government or Contractor Acquired)	
Sole Source - Lease (annual)	$ 200
Sole Source - Purchase	$ 500
Competitive - Lease (annual)	$3,000
Competitive - Purchase	$5,000
Commercial Software Packages	
Sole Source - Lease (annual)	$ 200
Sole Source - Purchase	$ 500
Competitive - Lease (annual)	$3,000
Competitive - Purchase	$5,000
Contractual Services	
Sole Source or Competitive	$3,000
Reutilization of ADPE	
Government owned	$5,000
Continued Leased (annual)	$ 200
Lease to Purchase	$ 500
Organic Systems Development (annual)	$3,000

*AFR 300-2

- The Air Force ADP Plan (AFADPP) - The ADP Plan is the annual, Hq USAF-prepared planning document which identifies the Air Force and DOD ADP goals and objectives for the current year and six subsequent years. Its purpose is to provide planning guidance and direction to Air Force organizations in terms of how the Air Force will employ ADP technology to support the AF mission. It is the initial planning document from which all others are developed.

- ADPS Master Plans (AMP) - ADPS Master Plans are prepared annually by each of the USAF ADPS managers. The AMP documents the ADP objectives for each USAF standard ADPS with guidance from the AFADPP. Projected Automation Requirements (PAR) included in the AMP document the detailed programmatic planning information. ADP resource requirements in the AMP are identified by command so that the single managers can project requirements in their MAJCOM ADP Plans.

- MAJCOM and SOA ADP Plans (MCAP) - MCAP's are prepared annually by the MAJCOM and SOA Single Program Manager with guidance from the AFADPP. MCAPs document the command's ADP objectives and resource requirements and include the detailed programmatic planning information through incorporation of the PARs.

- Projected Automation Requirement (PAR) - A PAR identifies an ADP resource and funding requirement two to seven years in advance of the need. PARs are submitted to Hq USAF as part of the AMPs and MCAPs to obtain Air Staff validation and to adjust funding levels through the Program Objectives Memorandum (POM) Process.

* * * * *

This chapter described the ADP acquisition process and the environment in which it must function. The next chapter describes the results of the evaluation of the process and its environment.

III. EVALUATION OF FINDINGS

III. EVALUATION OF FINDINGS

This chapter evaluates the performance of the Air Force ADP acquisition process described in Chapter II. The evaluation results presented herein are subdivided into two major sections, answering two fundamental questions:

- Is the Air Force incurring damage by the current ADP acquisition process?
- If so, what are the causes of this damage?

The following two major sections of this chapter address these two questions.

1. A PROCESS PERFORMANCE EVALUATION REVEALED THAT THE PROCESS IS UNNECESSARILY LENGTHY AND OFTEN INEFFECTIVE

Two approaches were taken in evaluating the performance of the process. The first, a classical process evaluation, consisted of a statistical analysis of the acquisitions that go through the process. The statistical analysis focused on the dwell times required to complete each step and the variances in processing time depending upon what is being processed. This evaluation approach was restricted to examining the process internally; its intent was to determine where the process experiences bottlenecks. Corrective measures can then focus on these problem areas. The quality of such an evaluation is dependent on the availability of aggregate performance statistics. There were significant voids in the available data and consequently, only a partial evaluation was possible using this approach. However, to the extent that this evaluation could be carried out, it indicated that the variances in processing time are more related to unique aspects of the individual acquisitions than to factors that can be captured by aggregate statistical analysis.

The second approach to process evaluation began with supplementing the statistical data with information obtained from case studies, from the Government and industry surveys, and from the literature review. The AF performance was then compared to that of private industry in acquiring similar resources. The performance of private industry was examined as part of the industry survey. In this approach, the process performance was judged against

an outside level of performance. Whereas the first evaluation approach addressed whether some classes of acquisitions are processed more efficiently than others, the second approach addressed whether the processing of even the acquisitions is satisfactory when compared to a standard of performance. The comparison indicated that the AF takes an average of three times as long as private industry to acquire ADP. It was therefore important to determine whether the excessive time expended in the AF acquisition process yields commensurate results in the form of more nearly optimal acquisitions. This was not found to be the case. Rather, it was found that the AF incurs a serious technology lag in ADP, that the process often fails to satisfy AF functional requirements for ADP, and that the AF pays an unnecessarily high dollar price for the ADP resources that it does acquire.

(1) A Limited Classical Process Evaluation Reveals Only a Slight Correlation Between Process Performance and the Size or Type of Acquisition

The acquisition process can be partitioned into the following four phases:

- Phase I - Requirements Generation. This phase consists of the identification of a requirement and the preparation of a DAR. Requirements generation primarily occurs at a Major Command (MAJCOM) or at the base level.

- Phase II - Requirements Approval. This phase consists of DAR approval at the Air Staff and the granting (or refusal) of a DPA by GSA and issuing of a DPD by the HQ USAF.

- Phase III - Procurement Cycle. This phase consists of the development of specifications, source selection, and contract award. In most (but not all) cases, procurement occurs either at a local contracting squadron or by AFCAC.

- Phase IV - Installation and Test. This phase is measured by the period of performance of the contract.

Having partitioned the acquisition process into the above four phases, the evaluation then examined the dwell times required to complete each of these phases and how the variances in processing time depend upon what is being processed.

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DEFENSE ADP ACQUISITION STUDY.(U)
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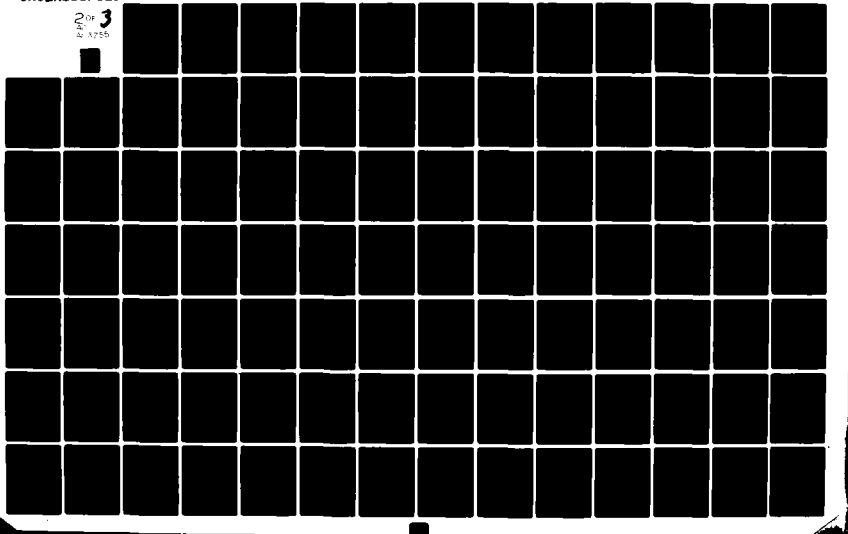


In order to characterize which acquisitions encounter greater difficulty in the process, a set of properties of an acquisition were defined. The properties that characterize an acquisition for the purpose of this evaluation are the following.

- Cost - The dollar value of the contract
- Purpose - Indicates if the acquisition is a new system, system replacement, system upgrade, interim upgrade, modification, or a service
- Type of Resource - Indicates if the resource is hardware, software, or services (e.g., maintenance, time-sharing, etc.), and whether the resource is purchased or leased
- Type of Procurement - Indicates if the procurement is fully competitive, limited competition (i.e., brand name or equivalent), or sole source
- Procurement Authority - Indicates if the procurement authority is AFCAC, base level procurement, or other (GSA, Systems Command, etc.)
- Approval Level - Indicates if DAR approval is by SAF/FM, USAF/ACD, or by the MAJCOM.

The intent of the statistical analysis is to determine which of these properties is highly correlated with unusual delays in one or more phases of the process. High correlations would indicate that the process operates less well for acquisitions having those properties. In order to perform such an analysis, it is necessary to collect aggregate statistics that include a representative sample of the acquisitions that went through any part of the process over a representative time frame.

Much of the data proved to be unavailable for this investigation. Aggregate data were generally unavailable for the requirements generation and installation and test phases of the process. Data were obtained for the amount of time required for GSA to issue a DPA, and the time required for AFCAC to conduct the procurement. For the GSA data a breakdown into cost and procurement type was available. The AFCAC data included only cost and time. Since the

samples for GSA and AFCAC represented different sets of acquisitions, it was not possible to track individual acquisitions through both the approval and procurement phases.

Limited available data indicated that the 300-series process is being used for a wide range of acquisitions. Table III-1 indicates the total number and average monthly number of DARs received at ACD from 1971 through September 1980. This table indicates the numbers of ADP acquisitions that require ACD approval. The percentage breakdown of acquisitions from 1978 to 1980 into procurement types is shown in Table III-2. This table is based on DPA processing statistics maintained by AF/ACD. Figure III-1 indicates the distribution by costs of a sample of 37 procurements for which the procurement authority was assigned to AFCAC. The data on which Figure III-1 is based are derived from a tally of 73 AFCAC procurements conducted since 1970.

A statistical analysis indicates that there is only a slight correlation between the size or type of acquisition and the time required for the acquisition process. This conclusion is based on an analysis of the data from AFCAC, AF/ACDA and GSA (reference Appendix D).

Figure III-2 graphs the cost of an acquisition against the time required for AFCAC to process the procurement. This time represents the number of months from issuance of a DPD to contract award. The points plot a sample of 34 procurements.

The presence of a large number of outliers indicated that the model is mispecified. A detailed analysis of residuals, presented in Appendix D, supports the notion that a cost vs. procurement time model is mispecified. That is, cost is not the primary determinant of procurement time.

Figure III-3 graphs the cost of an acquisition against the time required for GSA to process the acquisition. This time represents the time between the sending of an APR to GSA to the issuance of a DPA. The points plot a sample of 27 procurements. The 13 points labeled "s" were sole-source procurements and the 14 points labeled "c" were competitive. Two points, which are properly considered outliers on this graph, represent an acquisition costing $8 million and one requiring 175 days. The correlation between cost and time is 0.02, or essentially zero.

TABLE III-1

DAR WORKLOAD IN HEADQUARTERS, USAF
(BY MONTH FOR PERIOD 1971 – 1980)

YEAR / MONTHS	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	TOTAL MONTHS	AVERAGE
JANUARY	9	12	9	21	11	7	13	4	5	–	41	10.1
FEBRUARY	7	7	12	23	4	10	13	5	11	–	92	10.2
MARCH	5	17	23	19	9	11	14	6	13	–	117	13.0
APRIL	7	9	11	24	8	5	8	22	6	–	100	11.1
MAY	12	17	22	19	7	13	9	6	3	–	108	12.0
JUNE	8	15	30	22	6	23	9	5	5	4	127	12.7
JULY	7	9	26	30	11	27	6	10	7	–	133	14.8
AUGUST	5	13	29	49	7	46	12	7	12	1	181	18.1
SEPTEMBER	7	10	28	20	9	16	5	5	5	3	108	10.8
OCTOBER	–	10	19	17	14	9	7	11	4	3	99	11.0
NOVEMBER	–	8	10	25	17	13	9	9	7	1	99	11.0
DECEMBER	–	10	18	10	16	9	9	9	4	3	83	9.2
TOTAL	67 *	137	237	279	119	189	114	99	82	15 *	1,338	11.3

- TOTAL NO. DARs: – MAY 1971 TO OCT 1980 = 1,338
- AVERAGE NO. DARs PER MONTH – 1971 – 1980 = 11.3
- HIGHEST NO. DARs PER MONTH – AUG – 1977 = 49
- END OF 1971 – 1977 7 T, AND FY 78 – 80 SHOWN = (—·—·—·—)

* TOTALS FOR LESS THAN FULL YEAR

TABLE III-2

TRENDS IN TYPES OF PROCUREMENTS
1978-1980

	COMPETITIVE		LIMITED COMPETITIVE		SOLE SOURCE	
	%	Δ	%	Δ	%	Δ
CY 78	58	–	13	–	29	–
CY 79	41	- 19	25	+12	34	+ 5
CY 80	48	+ 9	29	+ 4	29	- 5
3-YEAR AVERAGE %	49%		21%		30%	
CHANGE 1978-1980	DOWN 10%		UP 16%		NO CHANGE	

SOURCE OF DATA: – DPA STATISTICS 2 JUNE 1980
– DATA FOR 1980 EXTRAPOLATED FROM 1 JUNE TO 31 DECEMBER

FIGURE III-1
COST DISTRIBUTION OF AFCAC PROCUREMENTS

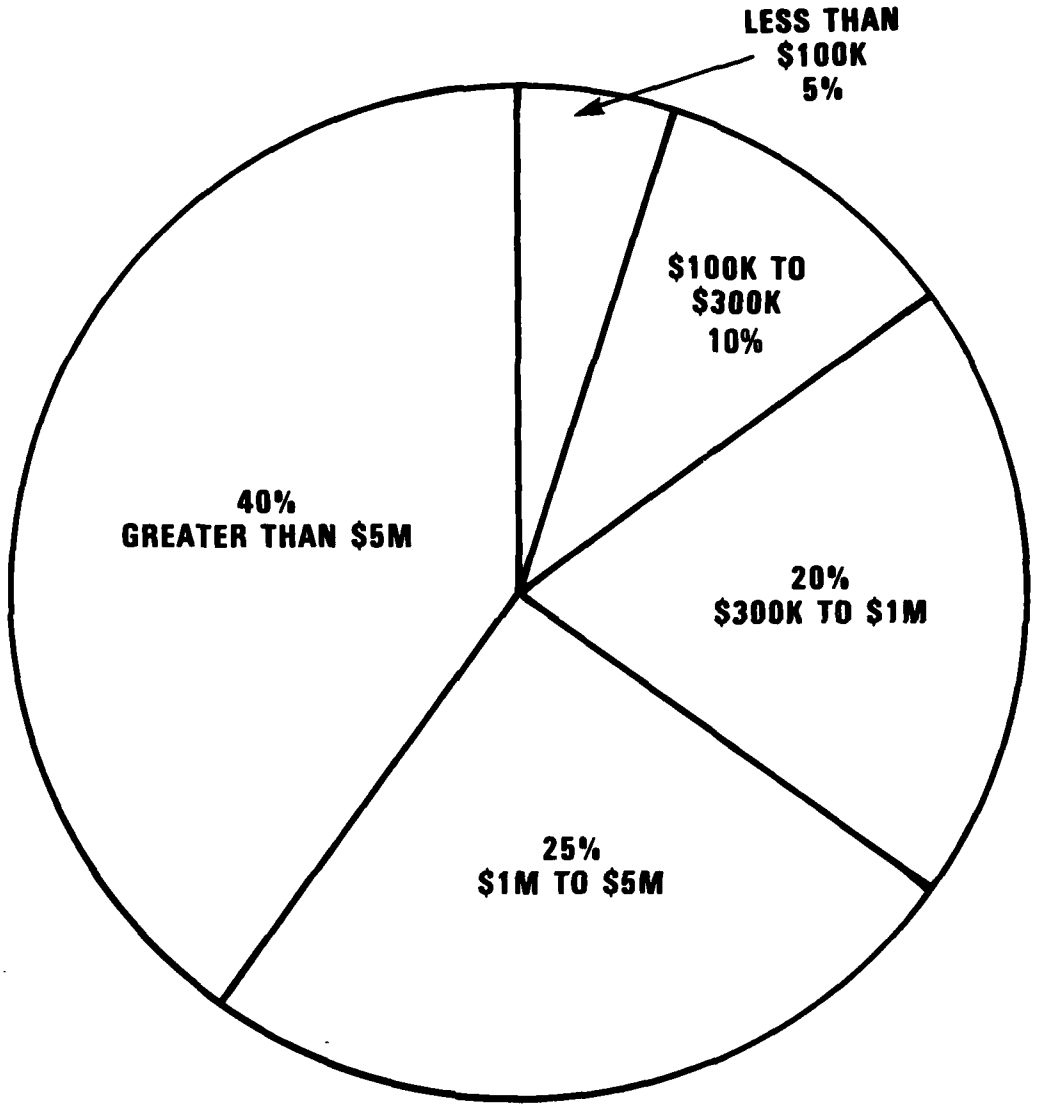


FIGURE III-2

AFCAC PROCUREMENT CYCLE TIME VS. COST

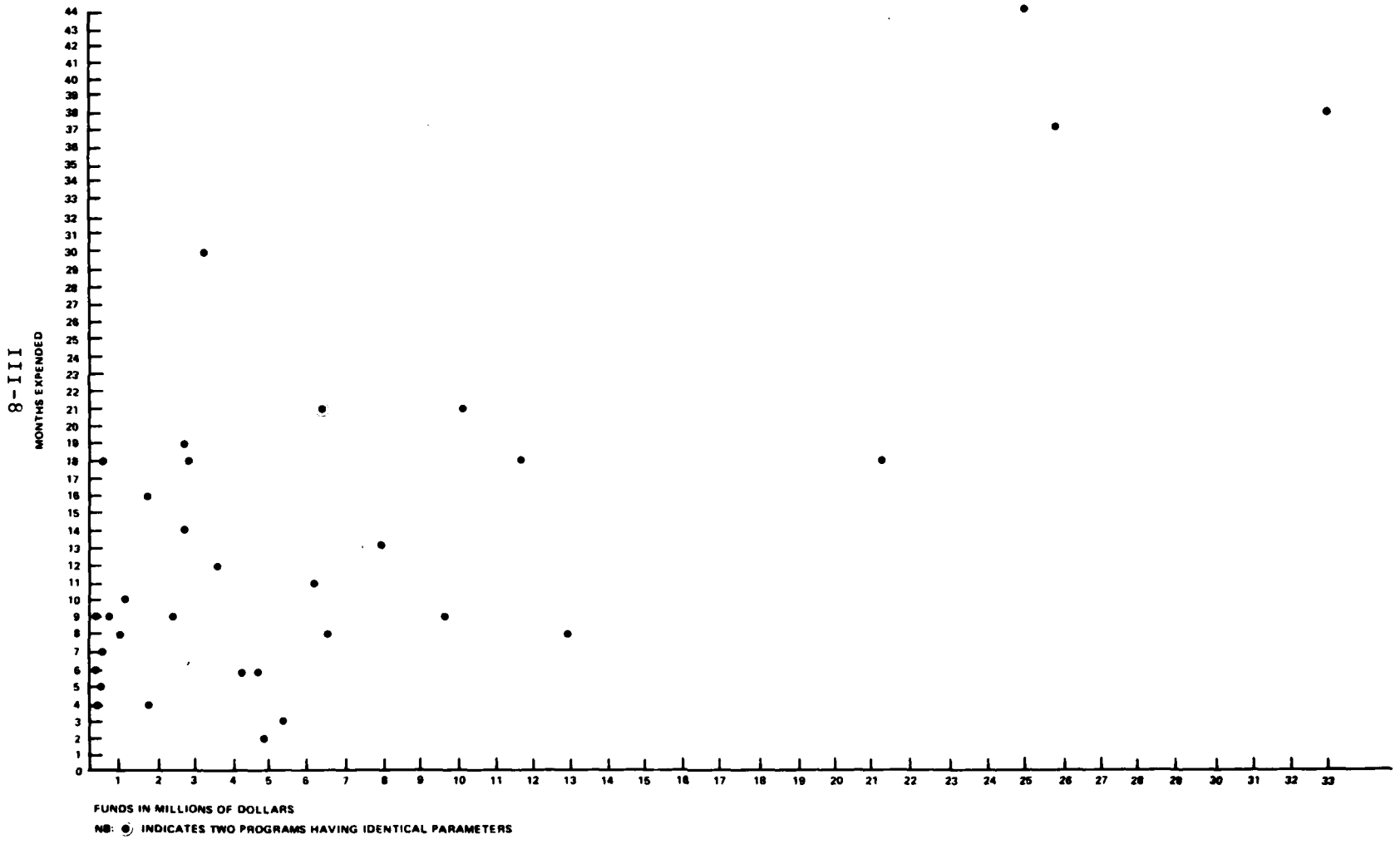
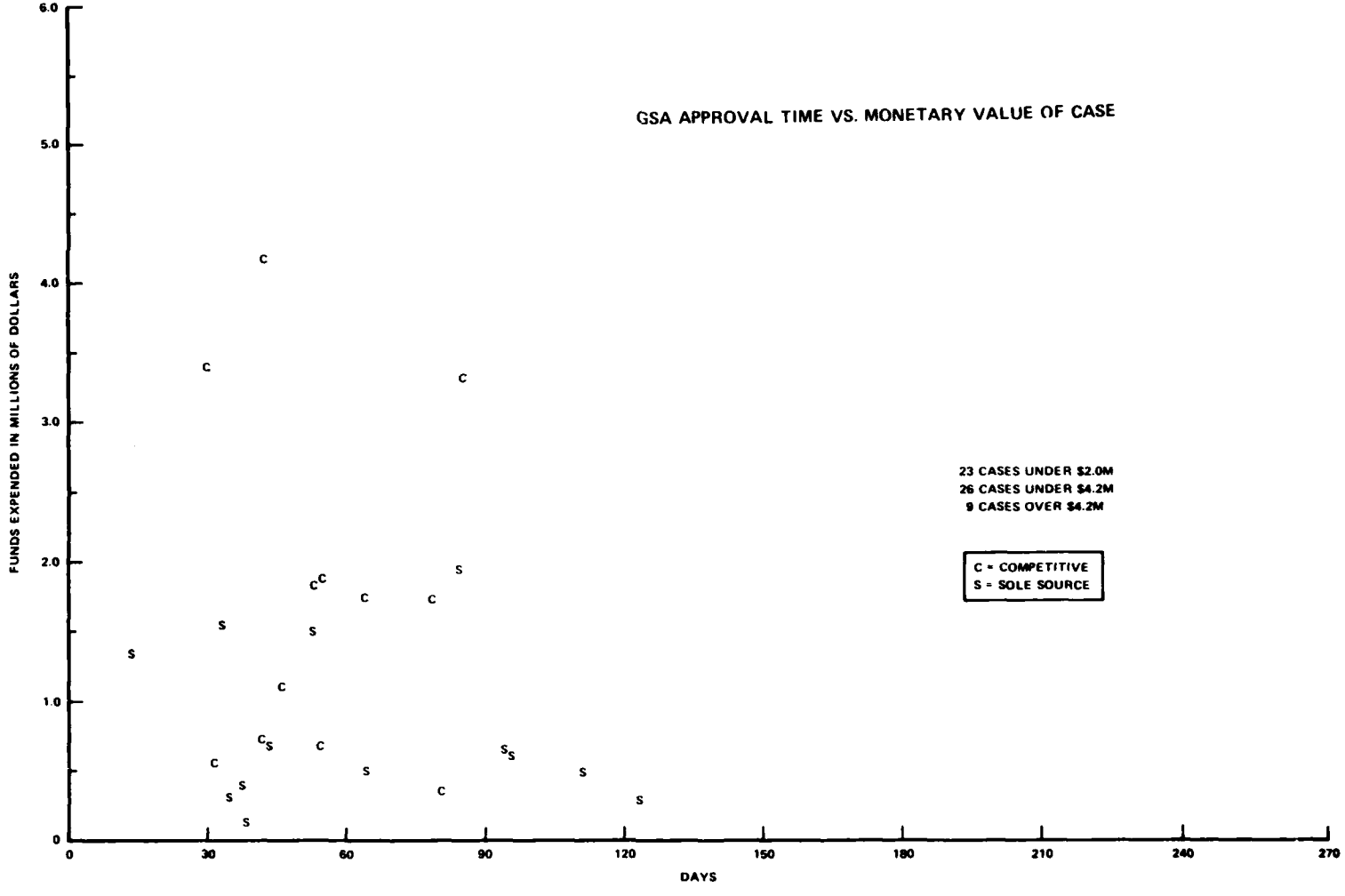


FIGURE III-3

GSA APPROVAL TIME VS. COST



This result is independent of whether or not the outliers are included in the calculation. Based on this sample there is a difference in average time depending on whether the acquisition is sole-source or competitive. The average time for all acquisitions is 63 days. If the acquisition requiring 175 days is deleted from the sample the overall average is 58 days. The average for competitive acquisitions is 51 days. With the one solesource outlier deleted, the average for sole-source acquisitions is 67 days.

An additional sample of GSA turnaround times, consisting of 60 acquisitions, was available. Cost and procurement types were not available for this sample. Based on this sample the average GSA processing time is 65 days. This result is consistent with the 63 day estimate from the sample described above.

The following conclusions emerge from this statistical analysis:

- The average processing time at AFCAC is 16 months.
- There is a positive correlation between cost and processing time at AFCAC. However, cost is not the primary determinant in AFCAC processing time.
- GSA typically takes about two months to issue a DPA.
- There is no correlation between cost and GSA processing time.
- Sole-source procurements take approximately 30% longer (about two weeks longer) than competitive procurements to obtain a DPA.

The data and detailed statistical analysis supporting these conclusions are presented in Appendix D.

(2) A Comparative Evaluation Reveals That Air Force ADP Acquisitions May Take Three Times as Long as Those in Private Industry

The second approach to the evaluation of process performance compared the AF acquisition performance with the performance of private industry. Case study, industry survey and literature review data supplementing the statistical analysis revealed that the AF may take approximately three times as long as industry to acquire comparable resources.

It is important to note that industry performance is only a basis for comparison and is not necessarily a goal. There is no assumption that it is possible to achieve industry performance levels or that the steps that might achieve this performance level are desirable when taxpayers' money is being spent. The conclusion of this section is that, in a different institutional environment, better performance is possible. Put another way, there is nothing intrinsic about ADP that causes the acquisition process to take as long as it does in the AF. Having established this point, it is then appropriate to examine how the Government's institutional environment and the acquisition process that occurs in that environment can be changed to achieve improved performance.

This process evaluation is restricted to describing the difference in performance between the AF and industry. The consequences of this difference in performance, described later in this chapter, include dollars unnecessarily spent and needed capabilities not achieved when needed. The reasons for the performance differential are described in Chapter IV in the discussion of the study conclusions. It is only through understanding these reasons that corrective measures can be proposed and evaluated.

Performing a comparative evaluation required the collection of data from the following additional sources:

- Commercial Cases - In order to compare the AF ADP acquisition process with commercial practice, the industry survey included gathering data on commercial users of ADP. The data included documentation of a sample of commercial ADP acquisitions plus aggregate performance statistics for two very large commercial users of ADP.

- Literature - The literature review included several reports that evaluate aspects of AF ADP acquisition (described in Appendix A).

- Industry Interviews - The industry survey included an extensive set of interviews with representatives of firms in various aspects of the ADP industry who have been involved in 300-series acquisitions. These interviews resulted in some information relevant to evaluating the 300-series process. The industry survey is discussed in Appendix C.

- Case Studies - A set of five case studies were prepared as part of this investigation. Each case study tracked a major ADP acquisition through all phases of the process that were completed (two of them are still in the acquisition process as this report is being prepared). The case studies are documented in separately bound volumes comprising in Appendix E.

1. Air Force Acquisition Process Was Analyzed With Data From Several Sources

Based on available data, it appears that the time required to complete an Air Force acquisition varies widely. The Preliminary ADP Acquisition Study, conducted by AF/ACD during the summer of 1979 (see ref. 7), examined the average time to process AF ADP acquisitions. The report examined the process from the time that a DAR is received at HQ USAF to IOC (Phases II-IV); the requirements generation phase (Phase I) was not included. The results of this study included the following:

- Based on a sample of nine acquisitions, the average time to complete Phases II through IV is 24.5 months. The following is a breakdown of the 24.5 months into the three phases:
  - Phase II: Requirements Approval - 7 months
  - Phase III: Procurement Cycle - 13.5 months
  - Phase IV: Installation and Test - 4 months.
- Based on a sample of nine different procurements conducted by AFCAC, the average procurement cycle time was found to be 23 months. This sample included four procurements that AFCAC considered complex and consequently the 23-month average should probably be regarded as an overestimate of the true average.

As part of the Government survey, representatives at MAJCOMs were queried about the time devoted to requirements identification and DAR preparation (Phase I). A figure of 4-6 months was found to be representative. Combining this number with the results of the Preliminary ADP Study, an average acquisition process time of 29.5 months is obtained. On the other hand, if the AFCAC survey is used as a source of data for Phase III, the estimated overall acquisition time is 39 months. Using the statistics plotted in Figure III-2, an average procurement cycle time is 16 months. The sample in Figure III-2 includes some complex acquisitions, but since it is a large sample, the results are not as severely skewed as with the AFCAC sample of nine acquisitions discussed above.

As part of this study, five test cases of ADP acquisitions were documented (Appendix E). Table III-3 shows the processing times for four of the cases for each phase of the acquisition process. These test cases were chosen to be representative of the types of problems inherent in AF 300-series ADP acquisitions. While they are not cases with extreme problems (such as Phase IV or ALS) they were chosen to illustrate some of the specific problems that can occur in the process.

TABLE III-3: PROCESSING TIMES FOR TEST CASES

	Hybrid	SAC Terminals	Global Weather	MASIIS/ TDSC	Average
Phase I	24	25	33	15	24
Phase II	8	12	33	18	18
Phase III	8	7	3	16*	8
Phase IV	13*	6	3	11*	8
TOTAL	53	50	72	60	59

* PROJECTED

If complex or difficult cases are disregarded, then the average processing time for the four phases of the AF ADP acquisition process is approximately 31-33 months. If the complex and difficult cases (the AFCAC survey and the four test cases) are included, then the average is 55 months. The data indicate that an acquisition time of 33 months is a conservative estimate for straightforward acquisitions that experience little or no problems, while difficult and complex acquisitions can result in acquisition times of 59 months and more to complete.

2. Data for Comparing the Commercial Acquisition Process to the Air Force Process Was Gathered During the Industry Survey

For a comparable ADP acquisition in the private sector, the average duration was 8-10 months. In order to determine the ADP acquisition performance of private industry, a set of firms that were known to have recently made acquisitions were contacted.

This survey identified eight specific acquisitions by commercial firms that are comparable to acquisitions that the AF would make under the 300-series process. In addition, two firms who make frequent major ADP acquisitions provided aggregate performance data. Data on three commercial ADP acquisitions were obtained but not included in the sample because they were deemed to be comparable to AF 800-series acquisitions.*

* Each of these was a new system for new applications (i.e., they were not replacements or upgrades). Each involved distributed processing and state-of-the-art data communications applications. Consequently, the acquisition process involved extensive systems engineering work. Despite a 6-8 month time to develop specifications and, in two cases, competitive procurement, the average and median acquisition time for the three cases was 2 years.

Table III-4 indicates the type of firm, the dollar value, and acquisition process time (from requirement identification to IOC) for the eight cases. In each of the eight cases, data were available on the breakdown of the acquisition into separate steps and time spent on each step. Because of inconsistencies in how firms partition the process, the requirements identification and approval phases were aggregated into a single phase for purposes of comparison. Table III-5 shows the comparison between commercial acquisition and AF acquisition. These data indicate that commercial firms take an average of 10 months to perform a general purpose ADP acquisition. If the Federation of Savings and Loans Societies is disregarded as an outlying data point the average (with a sample of 7) is slightly less than 8 months.

Two firms provided aggregate ADP acquisition performance data rather than specific cases. The information provided by the two firms can be summarized as follows:

- A major telecommunication company averaged ADP acquisition performance over a large number of acquisitions and several years. The majority of procurements are over $1 million. The acquisition time varies from 6 to 8 months.

- A large manufacturing company annually procures approximately $60 million worth of ADPE. The average acquisition time is 8.5 months.

This data supports the conclusion that industry performance, in general, results in 8-10 month acquisition times. Hardware vendor representatives who were familiar with industry practices indicated that the industry average is approximately 8-9 months.

(3) <u>The Current AF Acquisition Process Imposes Two Types of Damage on the Air Force: Excessive Acquisition Cost and Capability Loss</u>

This section examines two types of damage attributable to the AF ADP acquisition process performance.

Table III-4
Sample Commercial ADP Acquisitions

Type of Firm	Dollar Value of Acquisition (millions)	Acquisition Time (months)
Financial Institution	$ 1.0	11.0
Major Bank	11.0	13.0
Energy Exploration	.5	3.5
Financial Data Services	.5	4.0
Floor Products Wholesaler	.8	14.5
Manufacturer	.23	6.0
Time Sharing	6.4	2.0
Federation of Savings and Loan Societies	25.0	26.0
Average	4.25	10

Table III-5
Comparison of AF and Industry

Phase	Industry Average*	AF Average
Requirements Identification to Approval	3 months	13.5 months**
Approval to Contract Award	3 months	16 months***
Contract Award to IOC	3.5 months	4 months**

*Based on data pertaining to the sample in Table III-4
**Based on Preliminary ADP study
***Based on the data plotted in Figure III-2

1. Excessive Acquisition Cost Is Incurred

In the process performance evaluation, it was concluded that the ADP acquisition lead time in the Air Force is excessive. The longer than necessary acquisition time imposes additional costs on the Air Force, including the significant cost of technology lag.

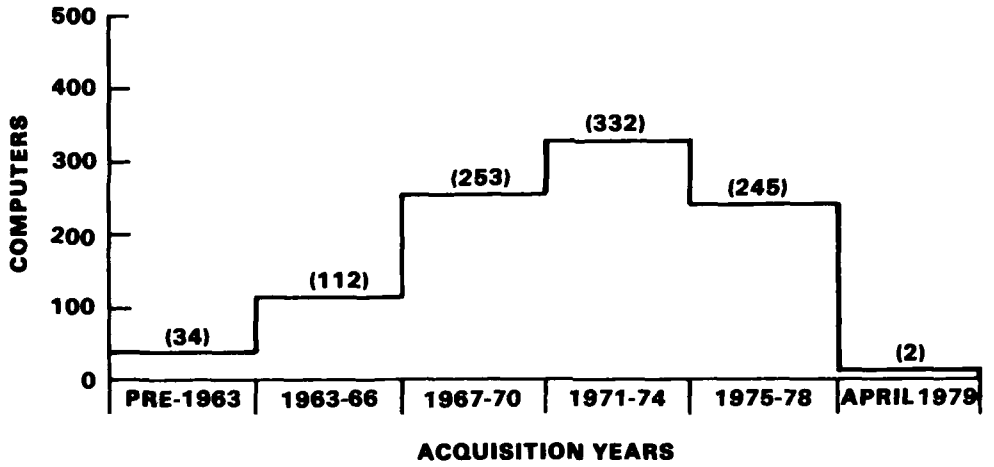
The average age of computer processors in commercial firms is 2-3 years. In general, industry replaces ADPE after 2-5 years. In the Government, the average age of processors is 9-10 years. Figure III-4 from the GAO report on obsolescence (see ref. 8) indicates that the majority of medium to large-scale Federal computers were acquired over 7 years ago. The charts depicted in Figure III-4 show the age of a sample of 978 medium and large-scale computers based on their acquisition dates (top chart) and their technological age (bottom chart). Based on these figures, the GAO concluded that the Federal inventory is old and growing increasingly outmoded.

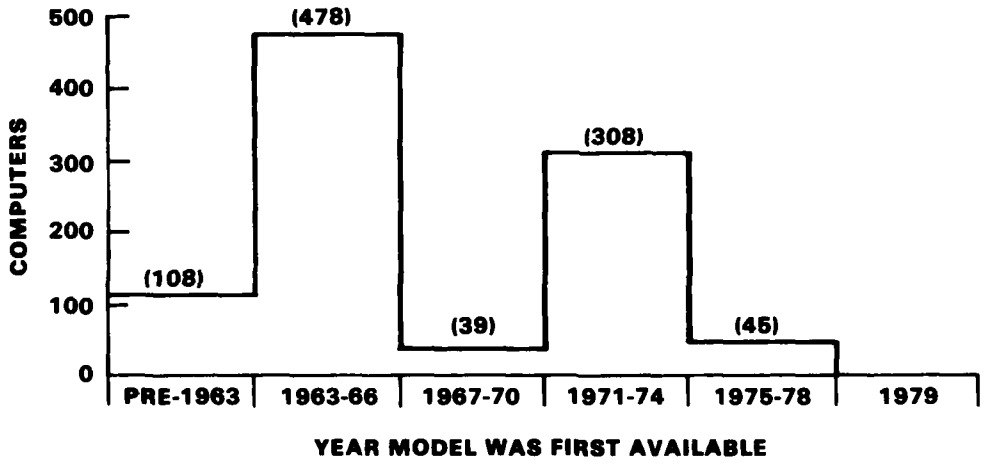
In addition to decisions to retain old equipment, the process sometimes results in decisions by the Government to buy equipment that industry will no longer purchase. That is, the Government buys equipment which is obsolete when it is installed. Figure III-4 indicates that most Federal computers are pre-1965 technology. The GAO reported (see ref. 8) that only 2 percent of the medium and large-scale computers in the Federal Government are using 1975 or later technology. One hardware vendor representative stated, "We can sell things to the Government that no one else will buy." Examples of obsolete equipment which the Government still buys are card punches, paper tapes, and IBM 360/65s (such as those replacing the IBM 7080s at AFLC).

The Air Force is incurring a greater expenditure of dollars for their ADP capability, because of their use of obsolete equipment, than they would incur if the same capability were acquired using newer equipment. In investigating the effects of technology lag, it was found that newer equipment not only offered greater capability, but also resulted in cost savings. These

FIGURE III - 4

AGE OF 978 LARGE–AND MEDIUM–SCALE FEDERAL COMPUTERS BASED ON THEIR ACQUISITION DATES AND TECHNOLOGICAL AGE





* TAKEN FROM GAO's "CONTINUED USE OF COSTLY, OUTMODED COMPUTERS IN FEDERAL AGENCIES CAN BE AVOIDED"

cost savings occur not only in the cost of hardware itself but in many auxiliary costs associated with the operation of a computer facility. These auxiliary cost savings are sufficiently large that even if functional requirements remain quantitatively and qualitatively static, equipment that is more than 5-7 years old should usually be replaced because the replacement will, in most cases, result in lower total overall dollar costs for the capability.

During the industry survey, and in the GAO's report on obsolescence (see ref. 8) many reasons for higher cost were cited. The following three cost components were among these:

- Maintenance Costs - According to vendor sources for commercial experiences, the maintenance cost of a computer increases by about 10 percent per year for about the first seven years. Thereafter, costs rise at a significantly higher rate.

- Cost of Operators - A decline in the cost of operators occurs when a smaller number of computers, and therefore fewer operators, are required. For example, at Tinker AFB the work currently being performed by three IBM 360/65s can be performed by a single IBM 3033 or equivalent. In addition, the single computer will accommodate growth while the three computers are saturated.

- Energy Consumption - Newer computers and peripherals operate on less power and have lower air conditioning requirements. It has been estimated that current processors can operate on as little as 20 percent of the electricity required by mid-sixties generation units with the same relative computer power (see ref. 8). Approximately the same savings can be realized on power requirements for air conditioning. For disc memory units, the per-unit power consumption has not changed but the capacity of units has increased by a factor of 20 in the last 15 years.

In addition to the three factors cited above, the following factors would result in savings which cannot be estimated as easily:

- System Reliability - Since newer systems operate more reliably, there are fewer costs due to non-availability of the systems.

- Floor space - Older systems include more and larger machines and therefore require more floor space.

- Uninterruptable Power Supply (UPS) - If UPS is needed, then the higher power requirements cited above imply greater cost for UPS.

- Personnel - Both the operation and maintenance of older systems is more labor-intensive than for newer systems and consequently more expensive. In addition it is becoming increasingly difficult to find and retain operators for these older systems.

The seven factors cited above indicate that the AF incurs dollar costs from the use of obsolete equipment. Table III-6, which is excerpted from the GAO report, Continued Use of Costly, Outmoded Computers in Federal Agencies Can Be Avoided, (see ref. 8) illustrates potential savings for four cases examined by GAO.

An additional factor which was cited by virtually all industry and several Government representatives is the quality of the programming staff. In general, functional requirements are not static. Therefore, software maintenance and (when capacity permits) new software development is constantly needed. Quality programmers do not want to work on obsolete systems. Although it is difficult to assign a dollar value to the morale problems of programmers, the problem of attracting and holding competent computer professionals in the Government is widely recognized.

*TABLE III -6

Summary of Economical System Replacement Illustrations

	Illustration A		Illustration B		Illustration C		Illustration D	
	Agency W		Agency X		Agency Y		Agency Z	
	Old	New	Old	New	Old	New	Old	New
Relative compute power (note a)	26.9	26.0	3.2	3.7	2.25	2.5	37	37
Processors	13	4	4	4	3	2	3	3
Core memory (note b)	1,834,000 bytes	2,096,000 bytes	262,000 words	262,000 words	456,000 words	512,000 words	c/6MB	12MB
External storage:								
Disk	5373MB	5660MB	5156MB	5536MB	986MB	1000MB	7656MB	7998MB
Drum	189MB	-	-	-	-	-	-	-
Floor space (sq. ft.):								
System	17522	6042	6000	4800	-	-	-	
Processor	7560	1860	284.4	118.3	-	-	564	83
Disk	-	-	218.4	64.0	-	-	998	104
Electrical consumption (KWH/yr) (note d)	8.3 million	2.75 million	1.65 million	.77 million	1.6 million	.19 million	2.08 million	.24 million
Cost (Annual):								
Timesharing services	-	-	-	-	$504,000	$ 50,000	-	-
Maintenance	$2,300,112	$ 550,620	$299,496	$ 66,352	328,284	-	$478,452	-
Rental	-	1,677,324	383,856	474,552	47,248	778,680	31,512	$470,316
Electricity	361,809	119,946	32,900	15,323	68,073	8,505	178,266	20,458
Total	$2,661,921	$2,347,890	$716,252	$576,227	$947,605	$837,185	$688,230	$490,774

a/Relative compute power is a measure of a computer's (s') processing capability. Based on these figures, one cannot compare the processor performance capability between manufacturers but only between processors of the same manufacturer.

b/Depending on the manufacturer, the size of core memory is described in terms of words, bytes, or characters.

c/MB - Megabytes, a million units (bytes) of storage capacity.

d/KWH/yr - Kilowatt hours per year.

*Taken from GAO's "Continued Use Of Costly, Outmoded Computers In Federal Agencies Can Be Avoided"

2. Capability Loss Is Also a Consequence of the Process

It is difficult to document a failure to satisfy functional requirements; generally, the systems that are acquired do satisfy the initial requirements. Failure to satisfy functional requirements arises as either a failure to accommodate growth or a failure to acquire a needed capability. Failure to acquire a needed capability may result from a decision by a user that satisfying a requirement is not worth the effort of going through the acquisition process.

Virtually all vendor industry representatives indicated that they were aware of many small applications programs that were not implemented because existing systems do not adequately accommodate growth. Throughout the Government and industry surveys, there was no support for the premise that functional requirements are static even in the general purpose MIS world, while there is ample evidence that the acquisition process has failed to accommodate changing needs. Even such standard ADP applications as personnel and financial record keeping are subject to change. Uniform cost accounting, affirmative action and all-volunteer forces were cited as typical examples of factors that cause functional requirements to change in these areas. Even in the absence of changing functional requirements, there are quantitative changes in requirements that the acquisition process has failed to accommodate. As an example of this failure, considerable doubt has been expressed that AFLC can perform essential wholesale logistics functions in a military surge, and this perceived deficiency is a direct result of ADP acquisition decisions.*

2. THE ANALYSIS OF ISSUES REVEALS THE ROOT CAUSES FOR THIS DAMAGE

The collection of data from literature, Government, and industry sources resulted in a large volume of information addressing a variety of perceived problem areas

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* Since many AFLC acquisitions became linked during the various approval processes, they are all mentioned in the separate volume on the MASIIS/TDSC case study in Appendix E.

which contributed to the damage cited in the previous section of this chapter. For the purpose of analysis, these data were sorted into thirty-three issues and analyzed to determine the recurring causes for the poor process performance. This section summarizes these issues and analyses.

(1) The Investigation of Deficiencies and Problems in the ADP Acquisition Process Resulted in the Identification of 33 Issues

The issues were documented in 33 Issue Papers based on collated data from all data sources. The source data (interview notes and published documents) were reviewed and pertinent facts and statements were synthesized or extracted verbatim and catalogued by issue subject. The total collection of collated data was then used to develop the issue papers. The resulting issue papers are attached as Appendix F.

Table III-7 depicts the primary sources of information for the development of each issue. While nearly every issue had contributing data from all three sources, only the primary sources are indicated. The positions taken by the various sources are rigorously documented in the collated data used to develop each issue paper.

Each issue was then analyzed to determine the root causes for each documented problem area. The analysis addressed three questions:

- Does the issue document a problem in the ADP acquisition process?
- Is it an internal Air Force problem (i.e. can corrective measures be taken within the Air Force) or does it require significant action external to the Air Force?
- What is the root cause for the problem?

The following paragraphs highlight the results of this analysis for each issue.

ISSUE #1: Standards - Two elements were addressed:

- Are standards appropriate in the ADP industry, which is characterized by rapid technological change?

TABLE III-7
Issue-Source Cross-Reference

Issue	Primary Data Sources: Government Survey	Industry Survey	Literature Review
1. Standards		X	X
2. Requirements Definition	X		
3. Technology Lag		X	X
4. Testing	X	X	
5. Training	X		
6. Planning	X	X	
7. Requirements Approval	X		
8. Program Management	X		
9. Solicitations/Proposal Evaluation		X	
10. Industry Response to Solicitations		X	
11. Contract Management and Procurement	X		
12. Specification Development & Approval	X		
13. Control of ADP Requirements Changes	X		
14. Types of Specifications	X	X	
15. AFCAC	X		
16. Types of Solicitations and Contracts	X		
17. Legislative Role			X
18. Congressional Conflicts			X
19. Executive Branch Conflicts			X
20. OMB's Role	X		X
21. GSA's Role	X	X	X
22. OSD's Role	X	X	X
23. Headquarters AF Roles	X	X	
24. Functional User/ADP Specialist Interaction	X		
25. ADPS Standard Systems Manager's Role	X		
26. AFR 300/800 Series Conflicts	X		

TABLE III-7 (Continued)
Issue-Source Cross-Reference

Issue	Primary Data Sources		
	Government Survey	Industry Survey	Literature Review
27. AFR 300 Series Process	X		
28. The Brooks Act	X		X
29. Competition, Conversion and LTOC			X
30. OMB & GSA Policy Performance			X
31. A-109 in ADP Acquisition			X
32. Life Cycle Management			X
33. Commercial Practices		X	

- Is the Government the appropriate organization to take the lead in developing standards?

Research revealed marked disagreement as to whether or not NBS Standards (FIPS) result in greater competition for Federal business, with subsequent long-term benefits outweighing the short-term implementation costs, or actually cost the Government money by locking in technology and limiting competition. Standardization is critical to Government Operations and has implications both in terms of external influences imposed on the Air Force, as well as the ability to set standards internally.

The ability of the Government to force industry compliance with Federal standards is based on the extent to which they can influence the market place. As the Government share of the ADP market declines, the industry will be less responsive to Federal Information Processing Standards than to those set in industry organizations, such as ANSI or ISO. Attempts to standardize on such a scale may severely limit competition and thus drive up the cost of doing business within the Federal Government.

Concerning DOD in general and the Air Force in particular, leadership appears to be lacking in the area of standards policy. Little active participation is evidenced in terms of both responding to external standards and establishing internal standards. These observations were most evidenced in the lack of effective long range standards planning and policy.

ISSUE #2: Requirements Definition - Several areas are addressed in the requirements definition phase of the acquisition process:

- Should functional requirements be used?
- Is the Data Automation Requirement documentation excessive?
- What studies and analyses should be performed?
- Can users adequately articulate requirements?
- What is and should be the role of industry?

The requirements definition phase was frequently cited as a major problem area in Air Force acquisition in that inadequate requirements definition usually results in delays in the process. Among the problems cited were:

- There is an inability on the part of users to articulate and communicate requirements properly.
- DAR documentation is excessive and solution oriented, particularly the feasibility study and economic analysis.
- The process results in premature commitments to solutions, particularly hardware solutions.

The analysis of this issue revealed several fundamental problems in the acquisition process. The first is that when requirements are poorly identified it is usually because the appropriate skills are lacking in the originating organization. Second, the process itself demands a level of documentation that is redundant, hardware oriented, and forces early commitments to solutions. Third, poor requirements definition can usually be traced to a lack of sufficient long range planning which has a total systems focus and life cycle management orientation.

ISSUE #3: Technology Lag - This issue focused on the causes, consequences, and costs of technology lag.

Considerable evidence supported the assertion that the Government incurs a significant penalty for using outdated technology because of technology lag created by a lengthy and excessively constrained acquisition process.

Technology lag reflects the damage caused by a lengthy and cumbersome ADP acquisition process. As a result, the Federal Government is incurring unnecessary costs by keeping old systems in operation rather than upgrading to more current technology. Previous sections of this chapter detail this viewpoint. A primary cause of technology lag is the long acquisition lead time and the failure of the process to adapt to a rapidly changing technological environment; however, more fundamental causes are a lack of a systems management approach and a life cycle orientation. These latter causes can be traced directly to Federal and Air Force policies, guidelines and practices.

ISSUE #4: Testing - This issue revolved around three questions concerning the use of benchmarking and live test demonstrations (LTD):

- Are LTDs cost effective?
- When are LTDs appropriate as a criterion for source selection?
- In which situations are pre-award versus post-award LTDs more appropriate?

Research indicated that although LTDs are costly and time consuming, they can be valuable in source selection; however, the following criticisms were noted:

- Expertise for managing effective LTDs is limited to AFCAC.
- Costs are driving vendors, particularly small vendors, out of the competition.
- LTDs often do not serve as an effective discriminator in the selection process and thus serve only to delay the acquisition.
- LTDs impose additional burden on the users to create representative benchmarks.

This is an area that is marked by much confusion with little specific guidance. The use of LTDs is not rationally applied to acquisitions on a case-by-case basis, but rather routinely applied to most acquisitions. Further, there is little guidance available on how or when to conduct LTDs, or in what situations it is cost effective to do so.

ISSUE #5: Training - The issue analysis addressed three areas concerning the skills and training of those who must function within the current acquisition process.

- Are specialized skills required to support the AF ADP acquisition program? If so, what is the availability of the personnel with such expertise?
- Does the lack of experienced, trained personnel delay the process?

- If training is inadequate, what are alternatives to improve skill levels?

The inadequacy of skills and training, and the ineffective use of personnel are serious detriments in conducting AF ADP acquisition and are a major source of delays in the process. Among the problems identified are the following more frequently mentioned areas of concern:

- There are serious deficiencies in the availability of qualified and experienced people to properly formulate requirements, develop justifications, and translate requirements into technical specifications and procurement strategies.

- There is a lack of career opportunity and training in computer resource management.

- The lack of job flexibility and technological challenges (primarily due to an obsolescent computer inventory) inhibit retention of quality computer specialists.

- Skilled personnel are not utilized effectively.

The shortage of skilled personnel in key disciplines is a serious problem that pervades the entire military. However, this problem is further compounded when personnel resources are not effectively utilized. Both training and the allocation of resources must be considered in improving the present situation.

ISSUE #6: Planning - This issue dealt with the effectiveness of long range ADP planning in the Air Force.

Research revealed the Air Force long range ADP planning is programmatic and effective in obtaining the necessary funds and resources to acquire ADP; however, strategic planning is virtually non-existent. There is a failure to effectively link mission planning to the identification of ADP programs.

The lack of a mission orientation in the acquisition process is most evident in the planning process. While fiscal planning is effective and important, the lack of strategic planning has limited the effectiveness of the acquisition process. The consequences of this are exemplified by the failure to keep pace with technology and the lack of a life cycle focus.

ISSUE #7: Requirements Approval - This issue considered the delays in the ADP acquisition process traceable to the requirements approval process, specifically:

- What approval methods have been employed, and how can they be improved?
- To what degree should approval be decentralized?

The multiplicity of reviews in the approval process is a significant delay factor. Raising the approval thresholds so that MAJCOM Single Managers can approve many requirements that previously required USAF/ACD approval has been successful; however, other cirticisms remain:

- There has been a great deal of confusion as to what is being approved and by whom.
- Recent changes to AF HOI 300-4 put the burden of Air Staff coordination with the functional OPR. This has resulted in further delays in processing DAR's.
- The requirements approval process is what drives the solution orientation and the hardware focus of the DAR.

Decentralizing the requirements approval process is a step in the right direction. More fundamental changes such as separating needs approval from solution approval, tying needs approval to funds approval, and making more effective use of personnel and skills need to be effected to make the approval process more meaningful and less time-consuming.

ISSUE #8: Program Management - This issue analysis examined the Program Management role and authority in the ADP acquisition process.

The major problem is that responsibility transitions among users, ADP specialists and procurement during the course of an ADP acquisition making it difficult to establish accountability for a particular program. This lack of single accountability is evident in the following areas.

- Program Managers are not appointed early enough in the process to influence acquisition strategy.

- Program Managers lose control of their acquisitions when they are turned over to AFCAC to conduct a procurement.

- Program Managers lack the end-to-end control of an ADP acquisition.

The analysis of this issue reveals certain fundamental problem areas in acquisition management for ADP. First is the lack of accountability previously mentioned. Second is the ineffective use of personnel and skills caused by a transfer of responsibility and a lack of early involvement by key personnel. Third is the lack of flexibility in the current role of the Program Manager to influence the acquisition strategy and to carry out the acquisition strategy during the problem phase of the process.

ISSUE #9: Solicitation/Proposal Evaluation - Several areas are addressed in the solicitation/source selection phase regarding whether the Air Force procedures and methodologies provide for:

- Reasonable cost estimating
- Encouragement of competitive procurements
- Appropriate proposal evaluations
- Proper level of review.

The solicitation/source selection phase was often cited as a problem area because:

- Cost estimates are often questionable due to a lack of understanding of cost factors and lack of a standard life cycle model.

- There appears to be an over-emphasis on hardware competition without regard to total overall system cost.

- The number of procurement reviews is disproportionate to the benefits derived.

Analysis of this issue indicated several basic causes. There is a general lack of people skilled in ADP costing except at AFCAC and there is no standard life cycle cost model. Emphasis on competitive hardware acquisition has resulted in procurements that maximize hardware competition to the detriment of lowest total overall cost. The required procurement reviews tend to lengthen the procurement process and add little overall value to procurement itself.

ISSUE #10: Industry Response to Solicitations - This issue considered factors that adversely affect industry's willingness to respond to Air Force solicitations for ADP resources.

The following factors were most often cited by industry as problem areas:

- Transferring more risk to the winning vendor
- High cost of bidding, e.g., benchmarking
- Terms and conditions not normal to commercial practice
- Detailed cost data required of single bidders
- Short time allowed for bid responses.

The underlying issue is how much risk the Air Force should be willing to assume versus passing it on to industry. Currently, source selection procedures have been inflexible in that much of the risk is passed to the vendor. The result is the driving up of costs and the limiting of competition.

ISSUE #11: Contract Management and Procurement - This issue focused on the pros and cons of centralized versus decentralized procurement support in two areas:

- The responsibility for source selection and award
- The responsibility for post-award contract administration.

The centralized procurement support offered by AFCAC was cited as being highly desirable for larger ADP acquisitions (eg., greater than $3M). AFCAC is highly skilled in ADP procurements; however, their resources are limited. On the other hand, with few exceptions, base level procurement support, skilled in ADP acquisition, is virtually non-existent.

This issue points to two problems inherent in the ADP acquisition process--ineffective use of skilled human resources and a lack of flexibility. There is an ineffective use of the highly skilled AFCAC resources when they must support certain smaller ADP acquisitions, yet there is no alternative when that type of support is not available locally.

ISSUE #12: Specification Development and Approval - This issue dealt with three areas:

- To what extent does the specification development process contribute to acquisition lead time?
- How and when are specifications prepared?
- Who should prepare them?

It was found that the specification development process is a delaying factor in the acquisition lead time for a variety of reasons:

- The user has difficulty articulating requirements.
- Users in general do not know how to develop functional specification and tend to "over specify" a hardware solution.
- Little skilled support is available to the users during the initial stages of specification development.
- Specifications must usually be rewritten when procurement support (e.g., AFCAC) finally becomes involved.

Good specifications are a time driver in the process but they are essential to a successful ADP acquisition. Two causes are raised by this issue. First, the process drives users to over specify their needs, by being too hardware and solution oriented rather than functionally oriented. Second, the process implies an ineffective use of resources when it asks untrained users to prepare initial specifications.

ISSUE #13: Control of ADP Requirements Changes - This issue dealt with changing ADP requirements during the acquisition process and how to control these changes.

A number of reasons were cited for requirements changes during the acquisition process:

- Needs are not thoroughly analyzed prior to defining requirements.
- Requirements are not properly articulated.

- External environmental factors were not considered.

- There is an inadequate exchange of information between the user and the procuring activity early in the process.

Requirements changes cannot be avoided in the acquisition of ADP, particularly when the acquisition process is lengthy. Control of these changes is further complicated when requirements are not appropriately stated, solutions are constrained too early in the process, and the accountability for requirements transitions among different organizations.

ISSUE #14: Types of Specifications - There is considerable opinion on the use of functional versus technical specifications for procurement.

Congress and GSA favor functional specifications in order to enhance competition. Industry, in general, also prefers functional specifications because they enhance competition. Certain Air Force organizations feel that functional specifications present difficulties in ensuring compliance during proposal evaluation, and feel that the Air Force is avoiding its responsibilities by not specifying precisely what is needed in ADP terms.

For differing situations there are clear advantages and disadvantages for using one type of specification over another. The current hardware and solution orientation of the process tends to force the development of detailed technical specifications. The flexibility needs to exist within the process to use different levels of specificity as the situation dictates. Further, the expertise must be available early in the process to take advantage of one type of specification over another.

ISSUE #15: Air Force Computer Acquisition Center (AFCAC) - AFCAC was a controversial issue with a large segment of the Air Force ADP community. At issue is the length of time AFCAC takes to conduct an acquisition, AFCAC's role in the acquisition process, and when AFCAC should become involved with the user.

The duration of an AFCAC-conducted acquisition is too long based on even AFCAC's own internally established standards. Some of the reasons cited are:

- Using the same acquisition procedures regardless of program scope, size, and risk
- Over-zealous efforts to achieve competition to the detriment of schedule
- Delays in resolving disagreements with the user--a question of who is in charge of the program
- The lack of an early involvement in the process.

These criticisms concerning AFCAC's involvement in the process point to three deficiencies in the process. First is the apparent inflexibility with which AFCAC conducts of procurement, not tailoring the strategy to fit the size and scope of the program. Second is the lack of end-to-end accountability exemplified by the transition of responsibility from the user to AFCAC late in the process. Third is the ineffective use of skilled resources characterized by AFCAC's involvement in programs without regard to size, scope and complexity.

ISSUE #16: Types of Solicitations and Contracts - This issue dealt with the types of solicitations and contracts used in ADP acquisitions and their effect on the acquisition process. The analysis also addressed the Air Force means for communicating with industry regarding ADP acquisitions.

Requirements contracts are favored by a number of organizations, but there is dissatisfaction with GSA's handling of requirements contracts. GSA schedule contracts are also a source of dissatisfaction with some users. They cite the one-year duration, the non-competitive nature, inflexibility, the need to test the market and GSA's frequent failure to promptly negotiate contracts at the start of each fiscal year.

Many organizations cite the use of IFBs as a problem. They find it difficult to develop statements of work and specifications that do not generate a number of questions. Most Air Force ADP contracts are firm fixed price regardless of risk, uncertainty or anything else that would dictate using alternate approaches. There is also a strong desire in the Air Force for increased systems life, i.e., number of years on the contract, and the ability to upgrade in the vendor's line.

The Air Force, particularly AFCAC, was criticized for not being more open and flexible in its dealings with industry. Draft RFPs, vendor conferences, libraries and advance notifications of procurements were suggested as means of communicating the Air Force's ADP procurement plans. A further inflexibility is characterized by the restrictions imposed on the alternative acquisition strategies cited above.

ISSUE #17: Legislative Role - This issue analysis explored the extent of, and rationale for, congressional committee intervention in the AF ADP acquisition process. While various committees display interest in, or maintain oversight of, certain areas of the Federal agencies' acquisition processes, the House Government Operations Committee (HGOC) is particularly influential.

HGOC's involvement stresses the limits of oversight and contributes to delays. In its efforts to ensure maximum free and open competition, and to force better agency management of ADP resources, the HGOC intervenes and requests that GSA place holds on acquisitions.

Congress has become increasingly interested in agency ADP resource management, primarily due to a belief that management responsibility has been abdicated by the executive branch agencies. However, extensive oversight and scrutiny might be reduced through the demonstration by the AF and DOD that they have "earned autonomy" through effective ADP management, to the satisfaction of GSA and Congress.

ISSUE #18: Congressional Conflicts - This issue focuses on the philosophical conflicts between the HGOC and the HAC. The House Government Operations Committee (HGOC) and the House Appropriations Committee (HAC) are two of the most influential committees in the acquisition and management of ADP resources.

- Their disagreements as to how best to achieve the PL 89-306 goals of economy and efficiency have contributed to user agency problems in interpreting and implementing congressional guidance, as instructions from the committees are often contradictory.

- These committees have developed adversary relations with OMB and GSA, resulting in a mutual lack of understanding of objectives and basic mistrust of intentions, and an absence of consistent leadership and guidance to the user agencies.

The DOD and AF have been forced to expend additional resources to satisfy demands imposed by congressional oversight, and have been challenged to comply with conflicting congressional instructions.

ISSUE #19: Executive Branch Conflicts - This issue dealt with the confusion over the roles and responsibilities of executive branch agencies in the Federal ADP Program. The continuing lack of a central coordinator, planner and policy responsible agency has led to confusion, complexity and delays in user agency dealings with OMB and GSA and has fostered antagonistic relations, a prime contributor to ADP acquisition problems. Despite recognition of need for policy and procedural changes, neither OMB nor GSA have acted decisively due to unresolved authority and mutual "finger pointing."

Fragmentation of responsibility and resultant failure to reach timely decisions have created a policy void, which has led to excessive delays, confusion, and questionable actions in acquisition. Acquisition has become a focal point for political manipulation. Agency actions have sometimes been counter to intended goals of the system and have evoked congressional intervention, GAO audits, and charges of mismanagement.

ISSUE #20: OMB's Role - This issue focused on the failure of OMB to provide managerial and policy leadership to the extent anticipated by the ADP acquisition community.

The analysis revealed that the prime contributor to OMB's failure has been pervasive confusion and lack of executive level coordination and cooperation in administering the Federal ADP program. While the perception that OMB has been the senior ADP policy official may have been ill-founded based on PL 89-306 and EO's 11717 and 11893, PL 96-511 clarifies OMB's broad role in ADP policy.

The lack of clearly defined hierarchy of authority and responsibility has created an environment of antagonism and policy confusion throughout the Federal ADP Program.

ISSUE #21: GSA's Role - This issue analysis addressed GSA's performance as the central ADP procurement authority under PL 89-306.

The criticisms of GSA focus on the organization's failure to adjust to its dual procurement and policy roles. GSA has attempted to control the use of ADP resources through restrictive controls over the procurement process. It is not apparent that GSA's involvement with agency ADP management through the DPA procedure contributes to achievement of PL 89-306 objectives, provides additional technical expertise, averts wasteful expenditures, or ensures competition.

While the trend is toward significantly higher thresholds, and more flexible and consistent procurement procedures, the responsibility still remains for the AF (and other agencies) to be assertive, cooperate with the legislative and executive branches in formulating and implementing policy under PL 96-511 and the FPS, demonstrate competent ADP resource management, and earn the autonomy commensurate with their technical and managerial expertise.

ISSUE #22: OSD's Role - This issue focused on OSD's management of the DOD ADP Program, and concluded that OSD's provisions of ADP policy guidance and support to the services has been inadequate.

There is a perceived lack of a strong, centrally managed, and visible ADP organization. Problems contributing to DOD's difficulty in managing information technology resources include fragmentation of responsibility, limited size and resources, low visibility in liaison with external organizations, and mutually distrustful relations with Congress.

While deficiencies in DOD management of information technology resources are impeding their effective and efficient use, improvements are possible within the scope of OSD's authority by:

. Alleviating fragmentation of responsibility

- Increasing visibility and credibility through a more dynamic posture in communicating and cooperating with OMB, GSA, and Congress

- Addressing the criticisms of weak and ineffective policy.

ISSUE #23: Headquarters USAF Roles - This issue dealt with the roles, missions and performance of the Air Staff organizations and the office of SAF/FM.

ACD and other Air Staff offices were repeatedly criticized for the excessive amount of time required to staff requirements with little value added to the process, and for failure to develop, promulgate and issue proper policy guidance. The general feeling is that there are many reviews at the Air Staff, any one of which can say no and none of which can say yes. In addition, there was considerable controversy concerning the placement of the Senior ADP Policy Official in the SAF/FM.

The analysis of this issue points to two problem areas. The first is the ineffective use of personnel and skills on the Air Staff in that many of the functions performed by ACD in the management of ADP are performed by other Air Staff organizations for other types of support. Second, the lack of consistency in the ADP management and acquisition process with other processes (e.g., embedded systems, and telecommunications) is the source of much confusion.

ISSUE #24: Functional User/ADP Specialist Interaction - This issue covered the responsibilities and interactions of the functional users and the ADP specialists in the acquisition process.

The functional users tend to regard the ADP acquisition process (and personnel) as an obstacle to obtaining resources to satisfy mission requirements. The functional user frequently needs assistance in expressing his needs so that they will "sell" in the ADP community. He needs the assistance of the ADP specialist. The user also has a problem in managing changes in his requirements, particularly in large systems.

There has to be a strong interface between the functional user and the ADP specialists, right from the onset of establishing requirements. Articulating

functional requirements and translating them into ADP technical solutions and procurement packages require experience and skill. This skill is in short supply in the Air Force. Given the complexity of the ADP acquisition process, there is a need for specialists knowledgeable in the technology, current ADP acquisition policy, regulations, and contracting procedures, as well as the particular requirements of the mission.

Current procedures do not make effective use of the individual skills of three groups of participants in the acquisition process--users, ADP specialists, and procurement specialists. In addition, responsibilities transition among the three to the point that there is a lack of end-to-end accountability by any single group which often results in adversary relationships.

ISSUE #25: ADPS Standard System Manager's Role - This issue covered the role of the Air Force System Managers for the standard ADPS.

The role of the AF standard system manager varies greatly depending upon the specific system.

- Responsibilities are well defined for some systems, but not for others.

- For some standard systems, organizations other than the program manager are involved, leading to a situation in which the program manager has responsibilities without commensurate authority and resources.

Using the AFDSDC as the standard system program manager has worked well for standard base level applications, but has worked less well for ADPS 10 (MAJCOM Support) and for ADPS 80 (WWMCCS). When the applications are non-standard it may be well to examine whether standard system management is feasible or advantageous.

ISSUE #26: AFR 300/800 Series Conflicts - In comparing the AFR 300 series approach with that of AFR 800 series, two related findings emerged:

- There is a great deal of inconsistency in the management and execution of the two processes.

- There is much confusion and little centralized guidance concerning the scope of application for the two approaches.

The major inconsistency is that the AFR 800 series process is designed for larger, more complex acquisitions than the AFR 300 series process, yet it possesses greater flexibility and more decentralized decision making. The second inconsistency, and the source of much confusion, is that ADP can be acquired under both processes, yet there is no single management oversight. Decisions to use one over the other are seemingly based on convenience and personal preference rather than established management criteria.

ISSUE #27: AFR 300 Series Process - This issue analysis examined the AF 300 Series Regulations and their impact on the ADP acquisition process performance.

The major areas of perceived deficiencies in the regulations include the following:

- They define a process which is hardware and solution-oriented.
- They require an excessive level of documentation and number of reviews.
- They lack many of the systems disciplines normally required for systems acquisitions.
- They specify an inordinate level of centralized management control.
- The regulations are not clear and understandable.

While much of the inflexibility and restrictiveness of the current acquisition process has been attributed to the regulations themselves, there is a point of view that contends that the regulations do permit the needed flexibility. A close examination of the regulations revealed a certain degree of flexibility designed into the process; however, this nominal flexibilty has been negated by the restrictiveness of actual application.

ISSUE #28: The Brooks Act - This issue analysis sought to discover:

- What are the stated and perceived objectives of PL 89-306?

- Has the implementation been effective?

- Is the legislation fundamentally sound? What principles are in contention?

The stated purpose of the Brook's Bill was to provide for economy and efficiency; however, the perceived purpose varies from an attempt by Congress to combat perceived abuses in Federal agency ADP management and procurement to a mechanism to force competition and dissolve a monopolistic market environment. The law itself is usually deemed innocuous, but its implementation has not achieved the goals of economy and efficiency in acquisition. There is some controversy surrounding the soundness of the law itself. Many term the law as "harmless" and "ineffective" and state that its goals are laudable but its implementation has failed. Those criticizing the Act do so because it provides ambiguous and conflicting definition of roles, restricts agency authority to carry out their mission, and is overly concerned with hardware management.

ISSUE #29: Competition, Conversion, and LTOC - This issue addressed Federal policies on ADP acquisition in the areas of competitive procurements, software conversion and lowest total overall cost (LTOC) as criteria for selecting an acquisition strategy.

The analysis found that these policies have been unrealistic, by reflecting an overemphasis on hardware costs and cost avoidance through maximum competition, and neglecting the impacts of software conversion and the failure to use LTOC as an evaluation criteria.

ISSUE #30: OMB and GSA Policy Performance - This issue focused on the quality and effectiveness of ADP acquisition policies promulgated by OMB and GSA.

Federal ADP policy is complex, conflicting, overlapping, and long overdue for consolidation, clarification and codification. Analysis revealed that there has been a significant void of consistent leadership in ADP policy. There have been strong and often conflicting influences on policy, imposed by industry and Congress. Resulting policies have been ineffective in prompting timely acquisition of ADP, cost effective procurements, and maintenance of technological currency. Recent policy initiatives, including PL 96-511, the proposed FPS, and FPR and FPMR revisions are steps in the right direction.

ISSUE #31: A-109 in ADP Acquisition - This issue concerns the applicability of OMB Circular A-109 to ADP acquisitions.

The purpose of analyzing an A-109 approach is to determine its applicability to ADP as well as compare that process to current ADP acquisition methods. While A-109 is not the panacea for ADP acquisition, it does provide some useful lessons. Certain key ingredients of an A-109 approach were found to be lacking in the current ADP process, such as flexibility in acquisition strategies and approaches, an emphasis on mission orientation, the infusion of technological opportunities and the early involvement of industry in the process.

ISSUE #32: Life Cycle Management - This issue analysis addressed two questions:

- Is life cycle management of Automated Information Systems (AIS) being properly employed?
- Is lowest total overall cost (LTOC) given proper consideration in ADP acquisitions?

The consensus of comments, largely from the Defense Audit Service Report on the Review of the Implementation of DOD LCM Policies for AIS (see ref. 9), is that ADP Life Cycle Management (LCM) is not well implemented in the services for the following reasons:

- Insufficient OSD guidance on policy, procedures and terminology
- Lack of manpower resources in OSD
- Inadequate cost estimating and tracking practices
- Lack of a standard life cycle model for analysis.

Further comments indicated that ADP is being procured with too much emphasis on hardware costs, as opposed to LTOC, and that unnecessary costs are being incurred without the proper attention given to total life cycle costing. Specific recommendations cited from the data sources included:

- Change Federal ADP procurement policy to avoid unwarranted software conversion.

- Implement LTOC guidelines within DOD.

- Standardize LTOC and life cycle cost models for ADP acquisitions.

ISSUE #33: Commercial Practices - In this issue analysis, commercial practices were compared with those of the Federal Government to determine whether or not industry performs better than the Federal Government in acquiring ADP. The quantitative results of this analysis were presented earlier in this chapter. Other specifics were observed in this comparison:

- Industry uses functional specification more often.

- Industry uses past performance, responsiveness and other subjective factors as evaluation criteria for the award.

- Industry will stay with a vendor as long as they remain satisfied.

(2) Summarizing the Analysis of Issues Provides the Framework for the Study Conclusions

Following the separate analysis of each issue, a collective evaluation of all the issues was made to determine the underlying causes for the poor process performance. This analysis was made in two parts:

- The first determined the degree to which the Air Force can influence the process through its own redirections.

- The second identified the recurring causes for the problems evidenced in the analysis of each of the issues.

Table III-8 presents the results of the first determination. It shows that twenty-four (24) of the thirty-three (33) issues address problems within the jurisdiction of the Air Force. While this figure may be somewhat arbitrary in that issues were identified largely from sources internal to or close to the Air Force acquisition process, it is indicative of the degree of opportunity available to the Air Force.

TABLE III-8
Categorization of Problems

Issue	External Problem	Air Force Problem
1. Standards	X	X
2. Requirements Definition		X
3. Technology Lag		X
4. Testing		X
5. Training		X
6. Planning		X
7. Requirements Approval		X
8. Program Management		X
9. Solicitations/Proposal Evaluation		X
10. Industry Response to Solicitations	X	X
11. Contract Management and Procurement		X
12. Specification Development & Approval		X
13. Control of ADP Requirements Changes		X
14. Types of Specifications		X
15. AFCAC		X
16. Types of Solicitations and Contracts		X
17. Legislative Role	X	
18. Congressional Conflicts	X	
19. Executive Branch Conflicts	X	
20. OMB's Role	X	
21. GSA's Role	X	
22. OSD's Role	X	
23. Headquarters AF Roles		X
24. Functional User/ADP Specialist Interaction		X
25. ADPS Standard Systems Manager's Role		X
26. AFR 300/800 Series Conflicts		X
27. AFR 300 Series Process		X

TABLE III-8 (Continued)
Categorization of Problems

Issue	External Problem	Air Force Problem
28. The Brooks Act	X	
29. Competition, Conversion, and LTOC	X	
30. OMB & GSA Policy Performance	X	
31. A-109 in ADP Acquisition	X	X
32. Life Cycle Management	X	X
33. Commercial Practices	X	X

In reviewing the individual issue analyses, it was observed that for all the problems identified, there are a number of underlying causes which have a direct bearing on the current state of the ADP acquisition process. These are the root causes which were repeatedly mentioned during the issue analyses and are listed as follows:

1. Lack of effective leadership and policy direction

2. Hardware orientation and solutional focus of the ADP acquisition process

3. Ineffective use of skills and personnel resources

4. Inflexibility in the acquisition and management of ADP

5. Failure of the ADP acquisition process to adapt to a changing environment

6. Lack of accountability and end-to-end management in the process

7. Lack of a mission orientation

8. Lack of systems management and life cycle perspectives

9. Inconsistency in policy, direction and management of ADP.

Further evaluation of these deficiencies pointed toward three broad areas in the acquisition and management of ADP which require primary consideration.

The first deals with the overall objective of the ADP acquisition process. The hardware and solutional focus and the lack of a mission orientation indicate that the objective of the acquisition process is either poorly defined or misdirected. Second, the lack of flexibility and adaptability of the process, coupled with the lack of a systems and life cycle orientation, indicates problems in the current process design. Third, the lack of effective leadership, consistent direction accountability, and effective use of personnel skills point towards a mismatch of roles, responsibilities and skills.

* * * * *

The preceding analysis reveals that the problems and deficiencies in the AF ADP Acquisition Process can be traced to one or more of four categories, three of which were traced to areas within the Air Force's control:

- The objective of the Air Force ADP acquisition process is improperly focused.
- The Air Force acquisition process design cannot effectively accommodate all the situations for which it is being used.
- There is a mismatch of roles, responsibilities and skills within the Air Force.
- External ADP acquisition policy provides inappropriate and/or inadequate direction for the AF ADP program.

Further, major improvements can be achieved by addressing the problem areas internal to the Air Force. The next chapter presents the study conclusions in this framework. For emphasis, those areas internal to the Air Force are presented first.

IV. STUDY CONCLUSIONS

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This chapter presents the major conclusions of the study. In the previous chapter, a broad spectrum of issues was discussed and evaluated. Each issue was evaluated in terms of its causes and whether or not it could be corrected by focusing efforts internal to the Air Force. The conclusions, presented herein, identify the major causes and effects for the poor process performance cited in Chapter III. The following are the five major conclusions:

- Substantial improvements in Air Force ADP acquisitions can be realized by focusing efforts internal to the Air Force
- Current ADP acquisition process objectives underemphasize mission essentiality
- The current process design cannot adapt effectively to the varying Air Force ADP needs
- The Air Force ADP management structure contributes to the delays in acquiring ADP
- Confusion and inefficiencies have been introduced by top level Federal policy external to the Air Force.

Table IV-1 relates the issues discussed in Chapter III to one or more of the five major conclusions which they support.

1. WHILE EXTERNAL INFLUENCES ARE THE SOURCE OF MANY PROBLEMS IN THE AIR FORCE ADP ACQUISITION PROCESS, MAJOR IMPROVEMENTS CAN BE ACHIEVED BY REDIRECTIONS WITHIN THE AIR FORCE

A basic conclusion of this investigation is that although there are external constraints imposed on the Air Force by higher authorities, many of the major constraints on ADP acquisitions are self-imposed. These constraints would appear to have a variety of causes. In some cases, policies which once promoted effectiveness and efficiency now constrain the achievement of these goals because of a changing environment or differing needs. Some policies have always been constraining to the process because they

TABLE IV-1
Issue-Conclusion Cross-Reference

Issue	Conclusion No.				
	1	2	3	4	5
1. Standards	X			X	X
2. Requirements Definition	X	X			
3. Technology Lag	X				
4. Testing	X		X		
5. Training	X		X		
6. Planning	X	X		X	
7. Requirements Approval	X	X		X	
8. Program Management	X			X	
9. Solicitations/Proposal Evaluation	X		X		
10. Industry Response to Solicitations	X	X	X		
11. Contract Management and Procurement	X		X	X	
12. Specification Development & Approval	X	X	X		
13. Control of ADP Requirements Changes	X	X	X		
14. Types of Specifications	X	X	X		
15. AFCAC	X			X	
16. Types of Solicitations and Contracts	X		X		
17. Legislative Role					X
18. Congressional Conflicts					X
19. Executive Branch Conflicts					X
20. OMB's Role					X
21. GSA's Role					X
22. OSD's Role					X
23. Headquarters AF Roles	X			X	
24. Functional User/ADP Specialist Interaction	X			X	
25. ADPS Standard Systems Manager's Role				X	
26. AFR 300/800 Series Conflicts	X	X	X	X	
27. AFR 300 Series Process	X		X		

TABLE IV-1
Issue-Conclusion Cross-Reference

Issue	Conclusion No.				
	1	2	3	4	5
28. The Brooks Act					X
29. Competition, Conversion and LTOC					X
30. OMB & GSA Policy Performance					X
31. A-109 in ADP Acquisition	X	X	X		
32. Life Cycle Management	X		X		
33. Commercial Practices	X	X			X

were based on erroneous perceptions of the external environment. Regardless of their cause, these constraints are addressed in this section because they provide opportunities for improvement that are within the jurisdiction of the Air Force.

This conclusion is supported by the issue analysis, which revealed that 24 of the 33 issues represent problems which are primarily internal to the Air Force. While all issues impact Air Force ADP acquisitions and thus present problems for Air Force considerations, these 24 can be addressed within the Air Force itself. Table III-8 presented these specific issues.

The next three major conclusions (conclusion numbers 2, 3, and 4) address those problem areas within the Air Force.

2. THE CURRENT ADP ACQUISITION PROCESS OBJECTIVES UNDER-EMPHASIZE MISSION ESSENTIALITY, IN FAVOR OF A PRIMARY EMPHASIS ON ACHIEVING THE GOALS OF ECONOMY AND EFFICIENCY

A basic deficiency in the ADP acquisition process is the lack of well-defined objectives from which policy, procedures and organizational roles and responsibilities can be developed. Many objectives have been cited for the ADP acquisition process; the most frequently mentioned is achieving economy and efficiency through maximizing hardware competition. While these goals were legitimately given primary consideration during an era in which it was appropriate to do so, factors have changed the environment in which ADP acquisitions must be accomplished. First, technological advances have resulted in categorizing a greater number of computer resources into the class of "General Purpose ADPE." Second, use of ADP has become widespread to the point that it is essential to the Air Force mission. These factors are evident in an analysis of the assumptions on which the current process is based.

(1) The Tenets of Efficiency and Economy Are Based on Assumptions Which Do Not Reflect Current Realities

PL 89-306 became law in 1965. Consequently the law, the policy framework that derived from it, and the current Air Force regulations are based on assumptions of that era. These assumptions include:

- Hardware is the primary cost component of ADP.

- Maximizing hardware competition will result in efficient acquisition and maximum economy.

- There is high degree of commonality in ADP applications.

Throughout the Federal ADP acquisition process, activities are oriented towards minimizing hardware costs and maximizing competition. Contracts are generally awarded based on the lowest hardware bid, without evaluation of relevant auxiliary costs. FMC 74-5 proscribed consideration of most software conversion costs in the calculation of overall costs for the selection of equipment through competitive acquisition. Although recent revisions of the FPMR have superseded this circular, the policy was designed to ensure that "care be taken to avoid undue biases or predispositions which are prejudicial to free and open competition." (FMC 74-5) A primary objective of the Federal ADP Standards Program is to reduce costs and improve productivity through fully competitive procurement. Regarding the assumption of commonality in applications, government policy encouraging reutilization of surplus computers is based on the premise of relative interchangeability of computers across a variety of applications.

These assumptions have been invalidated by changes in both the technological environment and the use of ADP within the Air Force. One of the major trends in the ADP industry is that hardware costs have been decreasing while costs of software (including software conversion), personnel, and facilities have been increasing. The industry survey revealed that technological advances have resulted in hardware costs decreasing significantly each year. This trend is expected to continue for the forseeable future. Since software development is still relatively labor intensive, its costs have been rising. One result of these price trends is that ignoring software conversion costs often results in a greater expense in the long run than that incurred from competition based on lowest total overall cost.

As significant as the reduction in hardware costs is the growth in the application of ADP. In the era from 1965 to the present, general purpose computers have gone from being used largely for accounting and payroll applications to a variety of specialized applications. Today, general purpose computers in the

Air Force support special test equipment, flight simulation, weapons and armament equipment, and sensor and surveillance systems, as well as the accounting and record keeping functions. Data Base Management Systems, transaction processing and real-time processing are commonplace in today's general purpose computers. As a result, the notions that ADP has a common application and that maximum efficiency and economy can be achieved through centralization and sharing of hardware resources are no longer correct. Of even greater significance is the fact that, through this technological sophistication, the Air Force is becoming increasingly dependent upon general purpose ADP to accomplish its mission. Robert V. Head, in a recent article in Government Executive (February 1981), described the magnitude of this problem:

> Information Systems Technology is so embedded in the Federal structure that critical administrative, scientific and military functions are all but totally dependent on the smooth functioning of computer hardware and software.

(2) Emphasis in the ADP Acquisition Process Must Be Placed on Satisfying Operational Needs as Well as Achieving Economy and Efficiency

Part of the Government and industry survey addressed the issue of which classes of acquisitions properly belong in a process whose only goal is efficiency of acquisition. The following distinct categories of acquisitions emerged from these discussions as a basis for comparison:

- Acquisitions that affect the administration of the AF as an institution
- Acquisitions that directly affect the ability of the AF to perform its mission.

This distinction separates acquisitions into two categories: those for which it is appropriate for efficiency of the acquisition process to be the exclusive consideration, those for which the effectiveness of the acquired system also needs to be considered. In light of technological changes and increased dependence on general purpose ADP use, more acquisitions are moving from the administration category to the mission essentiality category. Recent legislative changes establishing "exempt" and "non-exempt" categories for ADP systems is a recognition of this fact at the Federal level.

Because the current process responds primarily to the goal of maximizing efficiency, cost versus effectiveness tradeoffs are not generally performed. The source selection process at AFCAC consists of choosing among qualified vendors on the basis of lowest cost. That is, if one vendor can provide much greater performance than another who still meets minimum specifications, this greater performance will not result in his winning the award if his price is higher. For many systems, the more effective they are, the better they respond to the AF mission. Yet the process is not designed to examine the whole range of levels of effectiveness that can be achieved by performing tradeoffs between effectiveness and cost.

(3) The ADP Acquisition Process Lacks the Proper Degree of Planning to Effectively Focus on Mission Needs

This statement does not imply that the Air Force does not adequately plan and program funds to meet its ADP needs. On the contrary, managers feel that their ADP programs are well represented in the budget process and are usually successful in receiving requested funds. Instead, this conclusion asserts that current long range strategic planning fails to provide the appropriate mission perspective.

The lack of effective strategic planning has an adverse impact on the effective performance of the ADP acquisition process, the extent of which is difficult to determine. It was noted by many of those who responded during the Government and industry interviews that current Air Force ADP planning is "programmatic" and "reactionary" in that it responds to existing needs, but does not adequately plan for future requirements. Specifically, the lack of adequate strategic planning results in a process which does not adequately respond to evolving needs, fails to exploit technological trends and innovations, and fails to provide a basis for rational oversight and control.

1. Current Top-Down Strategic Planning Does Not Provide the Necessary Guidance for the AF ADP Program

Experienced ADP users in the private sector perceived the function of ADP strategic planning as threefold. First, it identifies the evolving functional needs beyond the immediate future

(i.e., 2-7 years); second, it considers needs in terms of changing environmental conditions (e.g., technological, organizational and legislative changes); and third, it provides strategies for attaining goals and objectives. An analysis of the Hq USAF ADP Plan (AFADPP) was made in light of these criteria. The following deficiencies were noted:

- The AFADPP is a compilation of ADP plans and programs based on individual functional area managers' views of their general purpose ADP needs and does not adequately address the implementable top level strategic planning objectives. Two areas were noted:
  - Top-down ADP policy addressing strategies for integrating the needs of various functional users was not apparent.
  - Future impact of technological change on the Air Force mission was treated only generally.
- The AFADPP is an after-the-fact documentation of decisions on individual programs which address present needs. It does not provide the necessary level of technology planning to guide the ADP managers in developing subordinate plans for the programming and budgeting of future needs.

2. Long-Range Planning at the MAJCOMs and SOAs Does Not Provide a Mission-Oriented Focus

The requirement for strategic planning cannot be confined to the Headquarters. MAJCOMs and SOAs are required to identify programs which are not only compatible within the Air Force as a whole, but also consistent with internal goals and objectives. A strategic planning function which integrates mission objectives and environmental considerations into a realistic set of ADP goals and objectives at this level was not apparent. The MCAP process was the only evidence of long range planning. While it serves the PPBS process well, the MCAP process is largely programmatic and is not effectively linked to a

coordinated set of mission-oriented objectives. The following observations are further evidence of the lack of strategic planning at the MAJCOMs and SOAs.

- The AF ADP plan was universally viewed to be of little value in the planning activities at this level.
- The MCAP is a collection of ADP programs (PARs) ranked according to need. It does not provide a master plan for the evolution of ADP within the MAJCOM/SOA.
- Initiation of ADP programs in the DAR process appears to be independent of the planning process. The fact that a DAR must identify a source of funds is the only linkage to the planning process.

This conclusion describes how the ADP acquisition process underemphasizes mission essentiality by inappropriately focusing on hardware savings through competition and failing to provide effective linkage between mission needs and ADP planning. The hardware and solutional focus of the process is further evidenced in a close examination of the process itself presented in the next major conclusion.

3. THE CURRENT ADP ACQUISITION PROCESS IS INFLEXIBLE AND OVERLY RESTRICTIVE IN THAT IT IS NOT ADAPTABLE TO THE VARYING NEEDS FOR WHICH IT IS BEING USED

The current process applies the same documentation requirements and processing procedures regardless of the scope or type of the acquisition. Tailoring of the process or the documentation to fit the acquisition seldom occurs -- even in those instances where it is permitted. The process is inflexible both by design and by virtue of the implementation practices that have evolved. This inflexibility can be seen by examining current regulations and the documentation requirements imposed by the process.

(1) The 300 Series Regulations Reflect This Restrictiveness and Inflexibility

The 300 series regulations are, in general, applied in the same manner to all types and sizes of ADP acquisitions. While dollar thresholds do control

the level of approval, the same documentation and approval procedures are required for equipment upgrades, new system acquisitions, system replacements, software acquisitions, maintenance services, and other contract services.

AFR 300-2 and 300-12 impose documentation requirements without regard to the type of acquisition. AFR 300-12 states that "requirements for developing, modifying or maintaining an ADPS or an ADS, or for acquiring ADPS components, will be documented using the DAR format." Under this direction, DAR documentation requirements are applied equally to different situations. For instance, DAR's are required for maintenance of systems that are installed and operating. Also, feasibility studies are required for system upgrades, despite the fact that feasibility has already been demonstrated since the process is already automated. This inflexibility thus imposes inordinate costs and delays in preparing, reviewing, and approving unnecessary documents.

Approval thresholds based solely on cost are inflexible. Two acquisitions may be of the same dollar cost, yet the complexity of the procurement and implementation may differ radically. Requirements approval fixed solely by the dollar thresholds may force decisions to higher levels than should be necessary. The workloads of higher level decision makers are thus increased, resulting in delays affecting all acquisitions and causing the risk of possible degradation in the quality of oversight for those acquisitions that really merit high-level attention.

The procurement process exhibits similar inflexibility, in that the same degree of discipline is applied to different types and sizes of acquisitions. AFCAC has a set of procedures which are uniformly applied to most procurements. The same procedures are applied to a $20M new system acquisition as are applied to a $300K equipment upgrade. Statistical analysis of 17 AFCAC procurements (Appendix D) showed that there was a wide variation in procurement time (mean = 14 months and standard deviation = 9.05 months). Cost acounted for less than half of the variation in the mean time. Data was not available to permit positive determination of the other factors associated with procurement time.

As indicated above, inflexibility results in costs to the Air Force and delays in the process. Statistically, it is highlighted by the low correlation between the size and cost of an acquisition, and the acquisition lead time (Ref. Chapter III). Some MAJCOMs have initiated "mini-DAR" procedures for acquisitions under $100K to alleviate some of this inflexibility. There is, however, a need to incorporate more of this type of flexibility throughout the 300 series process.

(2) The 300 Series Documentation Requirements Are Duplicative and Solution Oriented, Resulting in Delays and Less Than Optimal Decisions

The need to develop and cost all the alternative solutions in detail as part of requirements approval forces the premature development of solutions. Development of functional requirements and acquisition strategies is best done as an iterative process, between the functional users, ADP personnel, and procurement specialists. This is particularly true if the scope of the functional requirement is large. Premature "freezing" of requirements results in decisions based on less than adequate information.

The documentation requirements specified in AFR 300-12 contribute to the acquisition lead time. The DAR package consists of the following documentation:

- Executive Summary of the DAR
- Data Automation Requirement (DAR)
- Statement of Requirement (if telecommunications support is required)
- Feasibility Study
- Economic Analysis
- Executive Justification Summary
- Draft Data Project Directive (DPD)
- Draft Agency Procurement Request
- Statement of Work and GSA Form 2068
- ADP Telecommunications Requirements checklist

- ADPE List and Sole Source Justification (if required)
- System Development Notification (if change to existing WWMCCS standard systems is required)
- Software Conversion Study (if required)
- Case Synopsis (if SAF/FM is the approval authority).

Delays are caused by the duplication among these documents, and the level of detail and review required for each.

Although there is duplication throughout the package, the most duplicative documents are the DAR, the economic analyses, and the feasibility study. Each is a restatement of the ADP requirements originally presented in a requirements document, and repeated for different purposes in these three documents. The repetition is compounded by the executive summaries and the staff summaries which must be prepared at each level of review.

Not only are these documents duplicative, but they also contain an inordinate amount of detail. The overall sense conveyed by AFR 300-12 and HQ AF OI 300-2, Air Staff Automated Data Processing Action Officer's Handbook, is that much detail is required. AFR 300-2 describes the DAR, with its 15 sections, and the requirement to discuss and provide data on alternatives, e.g., all equipment types, cost and source, and cost data for each alternative. It states that the feasibility study "should be as comprehensive as resources permit ...." The economic analysis is a particular case in point. AFR 178-1, Economic Analyses and Program Evaluation for Resource Management, requires that all alternatives be costed and analyzed. AFR 300-12 states that "each economic analysis should be only as detailed as the situation dictates," but it goes on to require that the analyses be done in accordance with the 11 steps prescribed in the AFR 300-12 plus the requirements of AFR 178-1. The application of this rigorous development of costs so early in the process substantively adds to delays.

Each of these documents requires time for preparation, review, coordination and approval. The review, coordination and approval are repeated at all

the levels as the DAR moves up the chain from the originator, through the MAJCOM and MAJCOM single manager, and up to Hq USAF (if required). Within the large ADP staffs of MAJCOMs like SAC, the number and levels of review are considerable, each adding to the lead time and often contributing little value to the final outcome.

This conclusion describes the restrictiveness and duplicative documentation requirements of the current ADP acquisition process under the 300 series regulations, and highlights the resultant costs and delays. Further, delays are introduced by anomalies in the AF ADP management structure, as discussed in the following conclusion.

4. THE AIR FORCE ADP MANAGEMENT STRUCTURE AND ORGANIZATION CONTRIBUTES TO THE CONFUSION AND SUBSEQUENT DELAYS IN ACQUIRING ADP

The following four specific problem areas relate to the Air Force ADP management and organizational anomalies which impact the effective execution of ADP acquisitions.

- Inconsistency in the ADP management structure
- Confusion in the scope of application
- The lack of accountability and end-to-end management
- Ineffective use of human resources.

The process implications of these factors are discussed in the following paragraphs.

(1) The Air Force Has Established a Unique Structure for the Management and Acquisition of ADP, Unlike the Process It Uses for Acquiring Other Systems

The Air Force ADP management structure at the Headquarters USAF was cited by many as a major source of confusion in processing ADP requirements. Much of this confusion stems from the multiple and overlapping sets of policy which have been externally imposed on Air Force ADP management. Much of it, however, is a direct result of the way in which the Air Force has implemented these policies. In response to DOD Directives 4105.55, Selection and Acquisition of Automatic Data Processing Resources dated May 19, 1972 and 5100.40, Responsibility for the Administration of the DOD Automatic Data Processing Program dated August

1975 which implemented OMB Circular A-71, the Air Force established a unique management structure for ADP. Much of the conflict and confusion identified during the study investigation is traceable to management anomalies in the Air Force structure which are neither directed nor implied in these higher level directives.

In establishing an organization to manage the general purpose ADP program, four areas of responsibility were centralized in the predecessor organization of the Directorate of Computer Resources (AF/ACD). This centralized assignment of responsibility for ADP is not consistent with the way in which the remainder of the Air Staff is organized.

In managing General Purpose ADP, AF/ACD has responsibilities which duplicate the responsibilities of three other organizations at the Air Staff.

- The DCS for Research, Development and Acquisition (AF/RD) is responsible for acquisition policy and acquisition direction.
- The DCS for Operations, Plans and Readiness (AF/XO) is responsible for analyzing and planning for Air Force mission needs, including planning for high technology needs such as command and control and telecommunications.
- The DCS for Logistics and Engineering (AF/LE) has policy and management responsibilities for all "personal property" (i.e., property other than real property) in the Air Force.

Interviews with these organizations highlighted four areas of responsibility which demonstrate the anomalous aspects of Air Force ADP management.

- Acquisition
- Operations
- Requirements
- Support.

The responsibility for acquisition policy is carried out by AF/RD through the Defense Acquisition Regulations (DAR), which dictate the acquisition policy for DOD. The DAR, however, do not reflect the current Federal Procurement Regulations (FPR) which

apply to general purpose ADP. Though changes are in progress to correct this, FPR policy has been directed through AF/ACD in the 300 series regulations and the individual procurement delegations.

The responsibility for operational policy (i.e., setting Air Force goals and objectives for the use of high technology) is also divided. AF/XO, as part of mission planning, maintains technological expertise in areas such as command and control, and telecommunications. Maintaining a similar, and somewhat redundant, level of expertise for general purpose ADP planning is the responsibility of AF/ACD. This is particularly significant since telecommunications and ADP technologies and applications are rapidly merging.

The requirements validation and approval, and program direction for ADP is the third area of irregular procedure. The functional validation of non-ADP requirements is analogous to ADP requirements approval. However, the following three points, offered for comparison, indicate that the treatment of these requirements is not analogous:

- For non-ADP requirements, functional validation is performed by the functional area expertise on the Air Staff such as AF/LE, or AF/XO.
- For non-ADP requirements, functional validation and approval is the basis for obtaining funds.
- Non-ADP requirements are approved by the Requirements Review Group.

By contrast, ADP requirements approval is the ultimate responsibility of AF/ACD, by virtue of the signature authority for the ADP solution, and this occurs after funds have been identified. It was noted that the Table of Allowances (T/A) more closely resembles the DAR approval process in that a requirement is approved independent of the funding process, by the office responsible for management of the required commodity (i.e., AF/LE), and results in an authorization to acquire a particular item. The T/A, however, is not primarily intended to be used for high technology items.

There is a similar duplication of responsibility in program direction. Both AF/RD and AF/ACD have the authority to direct acquisition programs. AF/RD can issue Program Management Directives (PMD) under AFR 800-14, and AF/ACD can issue Data Project Directives (DPD) under AFR 300-2.

The fourth problem area is the unclear delineation of responsibility for support management of ADP resources in the Air Force. AF/LE claims responsibility for managing all "personal property" in the Air Force including ADPE. AF/ACD, as the central manager of ADP, has responsibilities for sharing and reutilization programs, as well as overall management of the Air Force computer inventory.

These organizational anomalies at the Air Staff were described in the field as being a major source of confusion in conducting ADP acquisitions. Management-related confusion is also evident in an analysis of the differences in the scope of application between AFR 300 and AFR 800 type acquisitions.

(2) In Setting Up a Separate Process for General Purpose ADP Acquisition, the Air Force Has Introduced Confusion as to Its Scope of Application

In establishing a separate process for acquiring general purpose ADP, and thus a separate management structure, the Air Force has introduced confusion between the scope of application for AFR 300 series and AFR 800 series. The existence of this ambiguity is illustrated by the fact that a survey of AF officials elicited varying responses as to what belongs in each process approach. There is little corporate level review to insure that acquisitions are being channeled in the appropriate direction. Decisions to use a particular acquisition process are made largely at the MAJCOM's based on personal preferences rather than official guidance. The details of this investigation follow.

1. The Lack of Precise Distinction Coupled With the Lack of Proper Direction Has Created Confusion in the Scope of the Air Force Regulations

The scope of the 300 series process encompasses General Purpose ADP resources including ADPE, software, computer programs, ADP contractual services, ADP personnel and supplies. ADPE in this case is defined as:

> General Purpose, commercially available ADP components and the equipment systems created from them,...which are designed to be applied to the solution or processing of a variety of problems or applications, but which were not specifically designed (as opposed to configured) for any specific application.

This scope explicitly excludes embedded systems. An embedded system is ADPE that is "integral to and in direct support of a combat weapons systems." A combat weapons system is defined in AFR 300-2 as:

> an instrument of combat, either offensive or defensive, used to destroy, injure, or threaten an enemy.

Embedded systems are acquired as part of the overall weapons system acquisition process which is governed by the 800 series regulations. The difficulty arises, in part, because there are many systems for which there is ambiguity as to whether or not they should be regarded as integral to and in direct support of a combat weapons systems.

The consequences of the lack of precise distinction in the scope of application of these two types of acquisitions have been confusion and an expansion in the scope of use of the 300 series approach. There was much criticism levied at the 800 series process by the MAJCOMs. The major complaints were that the process took too long, the MAJCOMs lost control over their own acquisitions, and the delivered capability sometimes did not meet the requirement. These criticisms, in conjunction with the absence of precise definition and corporate level guidance, have contributed to the heavier reliance on the 300 series approach. Unfortunately, this process does not explicitly provide for the appropriate degree of engineering discipline required for many acquisitions.

2. The AF-300 Process Does Not Provide for Many Systems Disciplines Which Are Needed for Many of the Acquisitions That Fall Within the Scope of the Process

The AF-300 series was designed to acquire resources requiring little or no special design and development. Therefore it does not explicitly provide for many of the systems disciplines, noted in Table IV-2, that are normally associated with acquisition of complex systems. Many of these disciplines are provided for in the AF-800 series regulations. Although provision for these systems disciplines does not guarantee success, they have been found to substantially improve chances of successful acquisition of complex systems.

Table IV-2: Engineering Disciplines in Systems Acquisitions

System Discipline	Planning Document (in AFR-800 Series)
Systems Engineering	Systems Engineering Management Plan (SEMP)
Logistics Support	Integrated Logistics Support Plan (ILSP)
Computer Resource Integration	Computer Resources Integrated Support Plan (CRISP)
Configuration Management	Configuration Management Plan
Operational Planning	Operations Concept
Test and Evaluation	Test and Evaluation Master Plan
Data Management	Data Management Plan
Quality Assurance	Quality Control Manual

There are many acquisitions that fall within the scope of the 300 series process which appropriately belong in a process that explicitly provides for these disciplines. The Missile Warning Bypass acquisition encountered delays in the approval process due to poor understanding of the system at AF/ACD and GSA. Specifically, the Economic Analysis was questioned and the need for a software conversion was incorrectly raised. ADCOM representatives indicated that a more disciplined approach during requirements identification might have avoided these problems. This system could have been acquired under the 800 series had the using MAJCOM decided to do so.

The Advanced Logistics System (ALS), however, could not have been processed under the 800 series, given current definitions. Some of the serious problems encountered by ALS are of the types that these systems disciplines are intended to prevent. These problems included the choice of a computer that lacked a needed parity checking feature; the fact that 90 percent of computer capacity was used by overhead software (i.e., only 10 percent of capacity was available for the applications programs); and the specification of 90 percent reliability for system components when the entire system had a requirement for 99 percent reliability.

In a more recent acquisition, the Phase IV program also encountered problems that might have been avoided by a more disciplined acquisition process. Although a program management office was established, the office lacked personnel with adequate training and experience in the systems disciplines. For example, there were no representatives from ATC or AFCC despite the training and communications impacts of the program. Further, delays resulted because facility requirements were not recognized in time for AF users to make necessary modifications.

The lack of explicit provisions for these engineering disciplines in the 300 series process is not the problem. There are many acquisitions for which they are not required. However, the deficiency is that acquisitions requiring a high degree of engineering discipline can and are being processed using the AFR 300 series approach and that sufficient corporate level screening, guidance, and direction are lacking.

(3) There Is a Lack of End-to-End Management and Accountability in the Current Process Design That Inhibits Operational Efficiency in ADP Acquisition

In discussing the anomalies in the Air Force management of ADP earlier in this section, it was stated that the resulting confusion affects the performance of an ADP acquisition program. Responsibilities transition among functional, ADP, and contracting specialists at the MAJCOMs/SOAs and at the Air Staff. Consequently, there is an apparent lack of accountability and end-to-end control for an acquisition.

1. No One Organization Is Responsible and Thus Accountable for the Life Cycle of an ADP Acquisition

One element of the detailed evaluation of the ADP acquisition process was an examination of the organizational participants who must interact in the process. This investigation revealed that a lack of clearly defined roles in the acquisition process results in confusing and delaying transitions of responsibility. The following three concerns pertain to these transitions:

- Transitions of responsibility must be accompanied by information exchanges which are delaying and contribute to the confusion.
- Major decisions affecting the acquisition program are ultimately made by different organizations with different interests. The result is a lack of accountability by any one organization for an entire acquisition.
- Transitions of primary responsibility within user, ADP and contracting organizations encourage an adversary relationship among the acquisition process participants.

A description of the transitions of control during each phase of an acquisition illustrates these three points.

During each phase of the acquisition process, there is at least one instance where primary responsibility transitions from one organization to another. The requirements definition phase begins with the identification of a need by an originating organization. During

this phase, primary responsibility for defining, analyzing and justifying the requirement is assigned within the organization, normally to a functional area manager. The ADP personnel support the functional area manager, and together play a strong role in the critical decisions affecting acquisition strategy and program implementation that are normally made at this time. The data automation support continues to be provided to the user until the DAR is completed and ready for staffing. At this point in the process, primary responsibility transitions to an ADP manager, and with it the responsibility for the DAR and all supporting program documentation.

During the requirements approval phase, primary responsibility remains within the data automation chain of command. A MAJCOM or SOA single manager or an ADPS manager must review and approve the requirements package and staff it through higher level authorities as required. When a delegation of procurement authority is required AF/ACD must then assume primary responsibility for the program in communicating with GSA, and the HGOC if necessary. This again involves a significant transfer of information, over and above what is, or should be, required for requirements approval.

Program management authority is assigned through the Data Project Directive (DPD), marking what was observed as the most confusing transition in responsibility. Normally, the DPD will assign program management responsibility to a MAJCOM/SOA ADP manager or ADPS manager, and procurement responsibility to either AFCAC or base level procurement. Thus, a working relationship among the user, ADP and contracting staffs must be established to effect the smooth functioning of an ADP acquisition. However, the delineation of roles and responsibilities is not always clear. The user, in parallel with requirements approval, normally prepares draft specifications to be incorporated in the RFP. Since the DPD marks the initial involvement of the contracting staff (especially if it is AFCAC), there must be a "meeting of the minds" among the three parties. When primary and support responsibilities are confused, this exchange of information becomes more difficult and time-consuming.

Many of the difficulties discussed above are evidenced by the actions of the single managers. For example, to avoid delays, the managers frequently use base level procurement support instead of AFCAC, despite their admission that AFCAC does a better job in the procurement. Their other criticism is that in using AFCAC they lose control of their own acquisitions. This criticism is justified. AFCAC is responsible for all procurement decisions, ranging from deciding on the type of specification that will be released in the RFP, up to and including the source selection. Once the contract is awarded, primary responsibility is returned to the MAJCOM/SOA program manager to monitor the performance of the contractor. After contract award, AFCAC's involvement is significantly reduced.

2. <u>There Is No Management Control System Which Monitors the Effectiveness of the Entire Process</u>

A second indication of the lack of end-to-end management was the difficulty experienced in collecting aggregate statistics on process performance. Attempts to assess the costs incurred due to extended acquisition lead time or lost capability were hampered by the lack of an effective management control system to monitor these costs. Omissions in the management control system include the following:

- The lack of a data base of performance measurement indicators
- The absence of a mechanism for auditing the results of an acquisition.

The lack of aggregate performance indicators is discussed in Chapter III. Just as significant as performance measurement in a management control system is the ability to audit the results of an acquisition to determine if the required level of capability was acquired and if the predicted benefits were achieved. Acceptance testing is the only audit of capability currently performed. While the test verifies that the acquired capability meets a minimum set of specified requirements, it does not insure that the requirements were properly specified, or that the benefits documented in the economic analysis have been achieved.

(4) Acquisition Under the Current Process Demands Skills That Are Scarce Within the Responsible Organizations, and This Inhibits the Efficiency of the Process

One of the most frequently encountered difficulties in the management of ADP resources in the Air Force was the inability of the user and contracting personnel to respond to the requirements of the current acquisition process. The two principal problems are the limited experience and the lack of sufficient training of the staff. Air Force representatives at all levels from base up to Hq USAF have noted these problems. They were cited as a major source of delay in preparing adequate documentation, particularly at the beginning of a program.

The following findings support the conclusion that personnel resource limitations are a major source of delay in the process:

- Each phase of the process involves activities that require special skills.
- There is a limited pool of personnel with adequate training and experience in the required skill areas.

The remainder of this conclusion details these two findings.

1. In Order to Conduct an Acquisition, Special Skills Are Required in Each Phase of the Process

In each phase of the process, special skills are required to prepare, review and approve the documentation required by AFR 300-12. These skills and their related activities are presented in Table IV-3.

Requirements definition is the responsibility of the functional personnel assisted by the ADP personnel as necessary. The preparation of a DAR and the supporting documentation requires a collection of diverse skills. The requirements must be spelled out in functional terms that clearly articulate what is needed and what benefits will be achieved. The process calls for requirements to be defined in sufficient detail to permit the early development and costing of

TABLE IV-3 AFR 300 SERIES SKILL REQUIREMENTS

PHASE	ACTIVITIES	REQUIRED SKILLS
Requirements Definition	Prepare Functional Description Conduct Feasibility Study Develop Alternative Solutions Conduct Economic Analysis	Functional Specialty Systems Analysis Economic/Cost Analysis ADP (HW/SW/Maintenance) Civil Engineering (Facilities) Telecommunications
Requirements Review and Approval	Staff and Approve DAR Prepare DPD	Functional Specialty Economic Analysis ADP Manpower Civil Engineering Telecommunications
Specification Development	Develop Specification	Functional Specialty ADP Design and Development (HW/SW) Procurement Civil Engineering Logistics
Procurement	Prepare SOW Prepare RFP Evaluate Proposal Conduct Testing	Functional Specialty ADP Civil Engineering Documentation Procurement (Federal/DOD regulations) Legal Pricing/Costing Evaluation

all alternative solutions. These solutions, and their costs, must include all aspects of the acquisition, namely hardware, software, maintenance, documentation, training, facilities, manpower and telecommunications.

Requirements approval implies the approval of both the functional requirement and the ADP solution. The two are tied together in the DAR. The approval of ADP solutions requires a broad knowledge of ADP hardware and software technology, and the relationship between this technology and a spectrum of functional problems. The review and approval process starts at the base level, includes a number of levels of authority, and requires a number of functional specialties in addition to the primary "user." In many cases the other functional specialists are inexperienced in ADP. Nevertheless, they are required to review and approve documentation that combines the functional requirements and the ADP solutions.

Specification development is done by the ADP personnel working in conjunction with the functional users. It represents the translation of a functional requirement to a technical requirement for hardware, software, services or combinations of all these. The specification must also address facility modifications and telecommunications. In many cases, it is a requirement to develop a technical specification suitable for competitive procurement. Procurement personnel cited the problem of non-competitive specifications as a major delaying factor in dealing with the users.

Procurement of ADP resources is a specialized branch of procurement, externally constrained by the requirements of FPRs and FPMRs. This type of procurement is also complicated by lease vs. purchase decisions (including varying options to purchase) and long term support options. The ADP industry has developed a unique set of proposal/costing methods. These unique methods make ADP unlike anything else the Air Force commonly procures. Sophisticated ADP procuring agencies such as AFCAC have developed computer software models to evaluate costs of complex acquisitions. Local procurement personnel need to be knowledgeable in the use of these models.

2. The Skills Required by the Current Process Are Lacking and Training Is Limited

The previous section established that special skills are needed to execute the 300 series process. However, most AF organizations lack an adequate pool of personnel with the requisite experience and training. This lack of trained and experienced personnel results from the infrequency with which functional personnel are called upon to articulate functional requirements.

For many personnel, DAR preparation occurs once in a career. Only in very few cases are functional personnel frequently called on to prepare DARs. Consequently, formal training in DAR preparation is not given. None of the persons interviewed who had previously prepared DARs had ever received training for it.

ADP specification development and procurement are closely related. Like the functional specialists, the ADP personnel seldom have to develop specifications. Technical specification writing of any kind is usually not done anywhere in the Air Force except in AFLC, AFCC, AFSC and in AFCAC. The specification preparation guide of AFR 300-12 is not a replacement for training or experience. Training in ADP specification writing is not generally available, and the ability to produce truly competitive specifications requires the close attention of ADP technicians who have extensive procurement experience. There is an inadequate pool of these experienced ADP technicians to support local contracting squadrons.

The above-mentioned shortcomings in skills and training are further compounded by the overall shortage of middle level managers in the officer corps. For example, the Air Force is using Lieutenants to fill Captain and Major positions in the technical career fields. One senior ADP offical commented that not only is there a large number of junior officers, but there is also a shortage of experienced personnel to give them on-the-job-training.

This conclusion delineated four specific problem areas within the Air Force ADP management and organization structure that contribute to confusion and delays and

inhibit the efficient and effective functioning of the ADP acquisition process. To this point, the conclusions have dealt with problems areas within the Air Force. The remaining conclusion addresses the constraints imposed by the external environment.

5. THE CONFUSION AND INEFFICIENCIES INTRODUCED INTO THE ADP ACQUISITION PROCESS BY TOP-LEVEL FEDERAL POLICY HAVE THEIR ROOTS IN CONFLICT OVER THE PROPER DIRECTION OF ACQUISITION REFORM

The Air Force ADP program functions within the Federal legislative and executive processes which comprise an external environment over which the AF has little control. An intricate policy framework has evolved from Public Law 89-306. This act establishes the basic structure and concepts for managing the acquisition of general purpose ADP within the Federal Government. Chapter II describes the organizational structure and summarizes the multitude of policies, regulations, and directives subsequently issued to implement the Government-wide policy direction at all tiers of the organizational hierarchy. This section addresses the constraints within the external organizational framework which adversely impact the functioning of the Air Force ADP program. In particular the following three areas of concern are addressed:

- Conflicting philosophies at the congressional level
- Indistinct roles and responsibilities of OMB and GSA as ADP policy authorities
- The role of ASD(C) in responding to contradictory guidance and implementing policy.

The implications of these constraints are explored in the following paragraphs.

(1) Philosophical Differences Between the Key Committees Influencing ADP Acquisitions Have Created Confusion Within the ADP Community as Organizations Attempt to Respond to the Conflicting Committee Guidance

Chapter II describes the roles of the House Appropriations Committee (HAC) and the House Government Operations Committee (HGOC), as two of the key congressional committees impacting the acquisition process. The dichotomous philosophies espoused by these Committees in fulfilling their responsibilities

in policy making, budgeting, and acquisition review are the source of much of the confusion which currently exists in the Air Force. Manifestations of philosophical conflicts at the committee level include inconsistent congressional direction, micro-management by committee oversight, and frequent intervention in policy development and implementation. The result is confusion within the ADP acquisition community as implementing departments, agencies, and organizations are forced to interpret and function under unclear and often contradictory policy guidance.

The influence of organizational elements which exercise oversight management forces the process to function in an environment of externally imposed, incompatible constraints. Due to this lack of clear policy and direction, a great deal of interpretation on the part of OSD and the AF is required in order to implement ADP policies and procedures. In tracing the organizational conflicts of the congressional level, two points must be addressed:

- There is a philosophical conflict over the optimum method for achieving economy and efficiency in acquisition.
- There is a tendency for agencies to respond to the HGOC position due to its oversight responsibility.

The following sub-paragraphs deal with the implications of congressional interest in the process.

1. <u>The HGOC Stresses Maximum Competition to Achieve Efficiency, While the HAC Focuses on Lowest Total Overall Cost</u>

The HGOC and the HAC have a basic disagreement concerning the optimum method to achieve the goals of economy and efficiency in ADP acquisition. Their philisophical differences are embodied in their interpretation of economy and efficiency, and thus their method of achieving it. On the one hand, the HGOC mandates the achievement of short-term economy and efficiency through lowest cost procurement by maximum hardware competition, while the HAC espouses lowest total overall cost (LTOC) in achieving the lowest cost to the Government in the long-term. The following points of contention highlight their differences:

- Interpretation of PL 89-306
- The role of competition
- Factors to be considered in lowest total overall cost evaluations.

Under its oversight responsibilities with respect to implementation of Public Law 89-306, the HGOC appears willing to incur significant diseconomies in order to achieve more widespread competition. This view is not shared by HAC, whose primary interest in ADP acquisition and management is the achievement of LTOC over the system life cycle. While PL 89-306 provided for the "economic and efficient" management of ADP, ADP technology has changed sufficiently that overemphasizing hardware costs hampers the achievement of these goals. In the interest of economy and efficiency, agencies are required to offer ADP hardware procurements to open competition to obtain lowest prices. However, this technique does not give proper consideration to other cost factors. The result is that LTOC is not achieved because significant cost factors are overlooked and, as a result, agencies suffer fiscal loss and even mission degredation at the expense of maximum hardware competition.

PL 89-306 designated the General Services Administration (GSA) as the responsible agent for acquisition, use, and maintenance of ADP, and the Office of Management and Budget (OMB) was given fiscal and policy control. GSA exercised its central procurement authority by issuing Federal Management Circular (FMC) 74-5 as implementing policy guidance for ADP procurement. Until its recent revision and incorporation into the FPMR, this circular was the key policy directive implementing PL 89-306. Its practical interpretation by GSA emphasized maximum hardware competition.

While the HGOC supports the achievement of maximum hardware competition as the primary strategy to maximize efficiency, the HAC believes that a strategy which emphasizes LTOC over the system life is more realistic. In conducting acquisitions under FMC 74-5, GSA has emphasized the hardware cost factors over other LTOC cost factors on the premise that a complete cost evaluation, including conversion costs, inhibits competition by favoring the incumbent vendor. While

competition does lower prices when hardware is the primary cost factor, these savings may be negated when other factors that determine overall cost are included. The HAC, the SAC, and many of the agencies believe that all relevant life cycle costs must be considered (whether or not they contribute to competition) to achieve the most economic and efficient solution. The HAC has instructed DOD to implement LTOC guidelines; however, agencies such as DOD must respond to the demands of the HGOC and GSA (which conflict with the HAC direction) in order to obtain a DPA.

2. HGOC Exerts Greater Influence Than the HAC Due to Its Direct Involvement in Reviewing Agency Procurement Requests

DOD and other agencies have attempted to respond to the conflicting congressional guidance, but a dominance by the HGOC and GSA in the acquisition process has directly influenced agencies' responses. Due to the HGOC and GSA management oversight responsibilities, the Air Force has been constrained by the philisophical preference for maximizing hardware competition over LTOC. Agencies must follow the GSA procurement regulations and structure their APRs to ensure maximum free and open competition, or run the risk of being unable to satisfy their ADP needs, despite the expressed intent of the HAC that the agencies strive for LTOC.

The influence of the HGOC on agency ADP acquisition is further evidenced in the rising attention being given to approaches aimed at increasing hardware competition. Two such approaches are:

- Unbundling of hardware and software acquisitions to encourage hardware competition
- Standardization of computer higher order languages (HOL) to minimize the effects of software conversion.

Both approaches are potentially costly to the functioning of the AF ADP acquisition process. Unbundling increases the number of acquisitions required to support a total system and thus increases the administrative burden and costs of

conducting the acquisition. The issue of standardization is receiving more emphasis at all levels of policy making. Attempts to standardize in the past have had adverse impact on acquisition lead time and technology lag. Converting to HOL software for the purpose of broadening competition is itself costly and extends the acquisition lead time.

Both the "unbundling" and "standardization" issues have serious implications to the ADP acquisition process. Their costs and benefits must be carefully considered. Because of the potential impact, these issues warrant special considerations, over and above what could be accomplished within the time frame of this study.

(2) A Further Impasse to Effective Policy Development and Implementation Results From Indistinct Roles and Responsibilities of OMB and GSA in the ADP Policy Environment

The conflicts evidenced at the congressional level are not unique. Incompatible acquisition philosophies, obscure lines of authority, fragmented responsibility, and uncooperative interactions permeate the Federal policy-making environment. The lack of concise ADP acquisition guidance which has characterized the acquisition environment since the passage of the Brooks Bill has been widely attributed to OMB and GSA. Factors associated with these two executive agencies that have contributed to the policy implementation confusion (as previously discussed in relation to the congressional level conflicts) include the following:

- Indistinct role definition of apparently authoritative policy organizations
- Conceptually paradoxical policy direction.

This discussion explores these characteristics of the executive branch policy environment.

1. There Are Jurisdictional Conflicts Between OMB and GSA

OMB and GSA each have ADP acquisition roles, assigned by PL 89-306. GSA was made the sole procurement authority, responsible for the acquisition, use and maintenance of ADP equipment; OMB

was assigned responsibility for policy and fiscal control. The coexistence of these organizations has led to diverse interpretations as to the function and responsibility of each. In addition, uncooperative organizational interactions have "yielded narrow, inconsistent, and incomplete policy." (see ref. 1). Since the 1965 Brooks Bill, GSA has acquired, through a series of executive orders, and assumed, due to OMB's inaction, much of the ADP policy making responsibility, in addition to its procurement responsibilities. This shifting of roles has resulted in a procurement-oriented policy, with overlapping organizational authority. There have been shifts of responsibility and authority between and within OMB and GSA that have hampered their effectiveness in issuing consistent policy guidance. Two sources of the jurisdictional confusion warrant amplification:

- The shifting functions and authority revealed in historical perspective
- The coexistence of policy organizations within each agency.

These two factors have heavily contributed to the jurisdictional conflicts and resultant policy deficiencies.

(1) <u>The Organizational History of ADP Policy as It Relates to OMB and GSA Is Characterized by Continuous Confusion</u>

In 1959, OMB instituted a program and organized a staff toward better overall management of ADP technology in recognition of Executive Branch concern for central leadership. From 1960 to 1965, OMB exercised its policymaking responsibilities through issuance of bulletins and circulars. In 1965, PL 89-306 established GSA as the central procurement authority.

Prior to the passage of PL 89-306, and consistently since its passage, OMB has opposed the Act because they disagreed with the need for legislation to establish the management functions that OMB had performed since 1959 (see ref. 1 p. 67). The Brooks Bill exhaustively defines the role of GSA

and fails to amplify the role of OMB, except to state that it should exercise "fiscal and policy control." While the law incorporated most of the features of OMB's previous ADP studies and circulars, it failed to clearly identify OMB as the lead executive agency for the management of ADP, the role described by OMB Circular A-71.

In 1973, Executive Order 11717 transferred a considerable portion of OMB's responsibilities for government-wide administration and financial management to GSA and the Department of Commerce. GSA received ADP policy control authority (except in relation to standards, the establishment and approval of which were transferred to Commerce) and OMB maintained general oversight and fiscal control. While the order states that "no function vested by statute shall be deemed to be affected by these provisions," OMB was effectively divested of its policy control responsibilities with respect to ADP. According to a recent report by a Panel of the National Academy of Public Administration, the intent of the President was for GSA to "assume a broader management role" through "overall leadership" in developing government-wide policy for ADP, and the other areas affected by the order (see ref. 3 p. 15-16).

Subsequently, a Department of Justice decision held that EO 11717 did not relieve OMB of its policy oversight and policy formulation responsibilities. This ruling also held that GSA was responsible for "developing policy based on OMB's formulation" (see ref. 1 p. 9-10). This attempt at clarification served only to increase the existing ambiguity by making an unclear distinction between policy formulation and policy development.

In 1975, Executive Order 11893 called for certain policy functions that had been transferred to GSA by EO 11717 to be transferred back to OMB. However, ADP policy authority was not transferred. Neither GSA nor OMB has exercised a strong leadership role, and each has blamed the other for the

failure to provide direction to the ADP acquisition community. The result has been a continuing lack of centralized policy direction and long range planning.

OMB has been perceived to be the responsible official, based on PL 89-306, but has not issued any major ADP policy guidance since OMB Circular A-71 in 1965. As a result, OMB has been faulted for "abdicating its policy responsibilities and expecting GSA to both formulate and develop ADP policy." GSA has charged that OMB has not provided adequate policy "formulation" to enable them to fulfill their policy development responsibilities under EO 11717 (see ref. 1 p. 10). OMB has apparently perceived its role to be one of "encouraging use of ADP technology" and "supporting the budget examination process," as opposed to one of developing ADP policy (see ref. 5).

GSA stepped in to fill this void by incorporating ADP policy into FPR's and FPMR's. Later, in July 1974, Federal Management Circular (FMC) 74-5 was issued, with the expressed intent to "update and consolidate ADP policy in one directive." This circular has since been superseded by revisions to the FPMR.

The recently passed Paperwork Reduction Act of 1980, PL 96-511, directs the establishment of an Office of Information and Regulatory Affairs within OMB, the head of which shall report to the Director. The Director of OMB "shall develop and implement Federal Information policies, principles, standards, and guidelines" (PL96-511) for automatic data processing and telecommunications functions and activities. OMB will also maintain its oversight responsibilities. The law states that "nothing in this chapter shall be interpreted as increasing or decreasing the authority conferred by PL 89-306 on GSA, Department of Commerce, or OMB." Since PL 96-511 casts OMB in the key ADP policy role, it would logically follow that OMB was assigned to this role by PL 89-306, and despite convoluted authority transfers and responsiblity adbications since 1965, the organization is still the senior ADP policy official.

The only clear aspect of this organizational history is the obvious confusion it has caused in the ADP acquisition community. This confusion is further evidenced in the second source of jurisdictional conflict between OMB and GSA -- the coexistence of policy organizations within each organization.

(2) A Number of Policy Organizations Coexist and Others Have Been Created and Abolished

The perception of overlapping authority and fragmented responsiblity has been enhanced by the presence of a number of organizations that have shifted and evolved since the passage of the Brooks Bill. The following discussion focuses on two organizations:

- Automated Data and Telecommunication Service (ADTS)
- Office of Federal Procurement Policy (OFPP).

Within GSA, ADTS was given responsiblity to execute GSA's ADP functions under PL 89-306. As previously discussed, the assignment of these responsibilities in GSA is open to varying interpretations. ADTS is authorized and directed under an amendment to the Federal Property Act of 1949 to "coordinate and provide for the economic and efficient purchase, lease, and maintenance of ADP..." (see ref. 3 p. 50). User agencies have complained that ADTS "lacks the technical competence to be of genuine assistance" (see ref. 3), and takes an inordinate amount of time for approval. (It should be noted that GSA has made changes toward improving the problems. "ADTS is committed to accenting its regulatory role and strengthening its management areas so it can provide oversight," (see ref. 3) and there has been a significant effort to delegate procurement authority. An Office of Policy and Planning has been created to develop policy and orchestrate up-front planning for both ADP and telecommunications.)

Fragmentation of organizational responsibility within GSA contributed to the problems in ADP policy development during the 1970s. In the wake of GSA's expanded role under EO 11717, the Office of Federal Management Policy (OFMP) was established to perform the ADP policy functions transferred from OMB. This office was subsequently abolished in 1975 when EO 11893 transferred most of the functions assigned to GSA by EO 11717 back to OMB. Since ADP policy authority was not transferred back to OMB under the second Executive Order, a small ADP Policy group, the ADP Management Policy and Planning function, remained intact; however, confusion resulted because their responsibilities were never clearly defined (see ref. 1). This group may be the nucleus of the current Office of Planning and Policy.

Two other ADP Policy groups have resided in ADTS: one within the ADTS Office of Agency Assistance, Planning, and Policy, and a second located within the Procurement Division of the Office of Automated Management Services. The latter group has been credited wih the development of "most of the ADP policy now in effect" (see ref. 1).

Within OMB, ADP policy oversight responsibility resided in the Information Systems Policy Division until 1975, when PL 93-400 (Office of Federal Procurement Policy Act) created the Office of Federal Procurement Policy (OFPP) within OMB, "to provide overall direction of procurement policy procedure, regulations and forms." The result was a lack of clear delineation of roles between OFPP and the Information System Policy Division regarding ADP policy development in OMB.

The location of OFPP within OMB, as opposed to GSA, has accentuated the jurisdictional disputes between these agencies. Lack of confidence in GSA has been noted as an overriding factor in this placement of OFPP in OMB (see ref. 3); however, the Commission on Government Procurement's recommendation to create an Office of

Federal Procurement Policy effectively excluded GSA by stating that OFPP should not be placed in an agency with a procurement function.

To further obscure the delineation of Federal policy making responsibilities, the National Telecommunication and Information Agency was established in 1977. This office, within the Department of Commerce, evolved from the Office of Telecommunications Policy within the Executive Office of the President.

The coexistence of duplicative policy organizations has created ambiguity as to the roles and responsibilities of OMB and GSA. This has adversely impacted the functioning of these agencies and challenged the ADP acquistion community in its efforts to respond to confusing direction.

2. <u>There Are Seemingly Contradictory Policies Being Implemented by OMB and GSA</u>

The indistinct delineation of roles and responsibilites is further evidenced in the conflicting nature of the resulting policy direction. OMB and GSA are mutually dependent in carrying out the Federal ADP Program, and yet the acquisition philosophy embodied in the guidance issued by these agencies is conceptually paradoxical. The ADP community has encountered problems in policy implementation due to an inability to reconcile the tenets of OMB A-109 with those of PL 89-306, as implemented by GSA FMC 74-5.

In response to the Commission on Government Procurement's recommendations (see ref. 11), OMB issued Circular A-109 in 1976, establishing policies to be followed in the acquisition of major systems. There have been roadblocks in the implementation of A-109 in the present form, as the requisite level of detail has proven prohibitive for the majority of ADP acquisitions and "there appears little that applies specifically to the ADP environment" (see ref. 1).

It has been alleged that GSA is in opposition to A-109, based on their failure to issue implementing instructions. Until recent revisions of the FPMRs and FPRs, FMC 74-5 served as the premier ADP policy document. This issuance, and its interpretation by GSA and the HGOC, favored the centralized procurement philosophies of PL 89-306. GSA has conducted acquisitions with hardware solution focus diametrically opposed to the mission needs focus of A-109.

The coexistence of GSA procurement policy with A-109, which lacks implementation guidance, has caused anxiety in the ADP community, despite the issuance of OFPP Draft Pamphlet #2, A Discussion of the Application of A-109 to the Acquisition of ADP/Telecommunications Systems, "to assist Federal agencies in the understanding and application of OMB Circular A-109" (Draft OFPP Pamphlet #2). In 1978, GSA and the OFPP jointly prepared OFPP Pamphlet #2 expressing the intent that ADP acquisitions follow A-109, with the coordination and approval of GSA and OMB. In addition to the problems of translating the activities outlined in A-109 to apply to ADP, "there is little inclination to embrace a new set of rules promulgated by an acquiescent and heretofore uninvolved OMB" (see ref. 1).

(3) Faced With Conflicting Philosphical Positions and Contradictory Guidance, ASD(C) Has Inadequately Responded to the Needs of the ADP Acquisition Community

In response to PL 89-306 and OMB A-71, the Directorate of Data Automation (DDA) was established as the focal point for ADP policy and management with the Office of the Secretary of Defense (OSD). DDA is not specifically assigned a role in ADP acquisition, and its present staff size would prohibit involvement other than on an exception basis. The Directorate has little formal influence over the military departments' computer acquisitions, as current directives do not include DDA in the approval process. To the extent that DDA is involved, their policy issuances have implicitly reflected that they best serve as a facilitator, rather than an instigator. Directives related to acquisition have acquiesced to the GSA hardware procurement orientation legislated in PL 89-306, implemented by FMC 74-5, and interpreted by HGOC. In recognition of GSA and HGOC influence, there has been

reluctance to issue implementing guidance on achieving LTOC in acquisitions. ASD(C) attempts to deal with the chaos and conflicting philosophies in the Federal ADP policy environment have highlighted two problems for DDA in administering the DOD ADP program:

- Effective guidance on achieving LTOC has not been issued.
- Lack of direct involvement in the functioning of the ADP process has contributed to marginally effective policy guidance.

The remainder of this section further defines these characteristics of ASD(C)'s performance.

1. ASD(C) Has Failed to Issue Solid Direction to Achieve LTOC in Acquisition Despite the Repeated Instructions of the HAC

In 1978, the HAC instructed DOD to develop and implement "lowest overall cost" criteria for its future procurements. In 1979, the committee reminded DOD of these instructions. DOD has failed to respond to these requests to the satisfaction of the Committee. While OSD officials have expressed acceptance of LTOC concepts, guidance has lacked potency, and OSD appears to have made a "conscious decision to defer available constructive action because of the application of existing policy" (see ref. 3). While DOD Directive 7920.1 on Life Cycle Management of Automated Information Systems and DOD Instruction 7920.2 on the Major Automated Information Systems Approval Process address LTOC, their light treatment does not qualify as solid direction.

OSD's inaction is partially attributable to the conflicting guidance of the HGOC and the HAC, and the overall confusion surrounding LTOC. OSD informed the Surveys and Investigations Staff of the HAC that unilateral DOD guidance is useless, since GSA has ultimate procurement authority, and consequently, any change in policy must come from GSA.

2. ASD(C)'s Minor Role in the Functioning of the ADP Acquisition Process Contributes to Problems in Policy Development and Implementation

The 1978 HAC Surveys and Investigations Staff Report (see ref. 1) concluded that as a result of the DDA's minor role in the ADP acquisiton process, its contribution to assisting the military departments has been marginal. In the absence of DOD guidance and direction in using the available cost analysis tools, the military departments have been acquiring systems under their own guidelines, with varying degress of effectiveness. The charge of ineffective guidance in the area of LTOC can, therefore, be traced to insufficient involvement at the functional level, as well as to confusion in the Federal policy environment.

* * * * *

In summary, the problems found in acquiring ADP were categorized into five major conclusions. The first conclusion is that many problems can be corrected by focusing efforts internal to the Air Force. The second, third and fourth major conclusions then describe the problems within the Air Force in terms of misfocused process objectives, inappropriate process design, and a mismatch of roles, responsibilities, and skills. The final conclusion describes the problems imposed on the Air Force by external constraints.

The next section presents the recommended strategies for correcting the observed deficiencies and accomplishing the overall study objectives. In light of the first conclusion, the major emphasis of the recommendations is on actions which are internal to the Air Force. The recommended strategies are presented in the same framework as the study conclusions -- the four recommendations corresponding to conclusions two through five respectively.

V. RECOMMENDATIONS

V. RECOMMENDATIONS

Many of the problems identified in this study have been discussed in the preceding chapters. Thirty-three separate issues were highlighted in Chapter III and their major causes concluded in Chapter IV. Correction of the deficiences identified in the analysis of these issues requires an integrated set of recommendations addressing fundamental changes in the acquisition process as well as specific changes in policy, procedures, roles, and responsibilities.

The recommendations presented in this chapter provide this integrated approach to correct the basic deficiencies delineated in Chapter IV. As such, they are more appropriately labeled strategies for changes rather than specific actions for improvement. These recommended strategies describe the changes which must be incorporated into the acquisition process and the ADP management structure to achieve the objectives of this study. Specifications for implementation are described in Chapter VI.

The recommendations of this study are categorized into four broad areas as follows:

- There must be a clear recognition that the purpose of the ADP program is to fulfill mission needs, and thus responding to that mission must be the primary objective of the ADP acquisition process.

- In light of the mission primacy objective, the process must be modified to incorporate flexibility to accommodate changing needs and adaptability to a changing environment.

- Internal roles, responsibilities, and organizational missions must be modified to accommodate changes in the process.

- External to the Air Force, implementing a mission-oriented, flexible ADP acquisition process should be complimented by changes in policy

and modification of organizational roles and relationships.

Specific recommendations in each of these areas are discussed below.

1. THERE MUST BE A CLEAR RECOGNITION THAT THE PURPOSE OF THE ADP PROGRAM IS TO FULFILL MISSION NEEDS, AND THUS RESPONDING TO THAT MISSION MUST BE THE PRIMARY OBJECTIVE OF THE ADP ACQUISITION PROCESS

Chapter IV concluded that the current acquisition process tends to place primary emphasis on economy and efficiency at the expense of fulfillment of operational mission needs. The analysis revealed the lack of effective policy direction and leadership, and the absence of mission orientation to be root causes of many of the problems in the ADP acquisition environment. The lack of well-defined objectives from which to develop policy and procedures and define roles and responsibilities contributes to difficulties in fulfilling mission needs. To correct this deficiency, the objectives of the process must be clearly defined and communicated through policy direction which accentuates the primacy of satisfying mission needs through acquisitions conducted in a manner which addresses the need, at the lowest life cycle cost, using maximum practicable competition.

(1) While Mission Primacy Is Not Exclusive of Other Acquisition Objectives, Satisfaction of Operational Needs Cannot Be Sacrificed To Achievement of These Other Objectives

Analysis revealed that the procedural focus on hardware acquisition as opposed to fulfillment of the mission need is at the core of much of the damage incurred by the AF in ADP acquisition and management. Inflexibility, restrictiveness, and solution orientation create a lengthy and cumbersome process which may result in less than optimal decisions. Inordinate costs and delays are incurred, and the mission need may not be satisfied in the most efficient and effective manner. To address this deficiency, it is recommended that the acquisition process objectives be reconsidered. In defining and communicating these objectives, the fundamental purpose of the ADP program must be underscored. In light of the need to conduct

acquisitions consistent with that purpose, the process objective should be to satisfy mission needs, within the required time, at the lowest life cycle cost. Completition should be used to the maximum extent practical to satisfy this objective.

The recognition that satisfying the mission requirements is the primary objective of the process is the keystone for all other recommendations of the study. This premise is the essential ingredient of the recommended changes in the process--changes that address the underlying causes of the pervasive problems identified in the analysis of issues. This is more than a philosophical change, for the implications are concrete in terms of changes to the process and modifications of roles and responsibilities. While each specific recommendation will be addressed in detail in this chapter, a mission orientation implies such pervasive changes as a life cycle and systems management orientation, increased flexibility, and decentralization of responsibility and accountability in defining and satisfying requirements. In addition, to effect this shifting focus to mission primacy, a link must be formed between the mission and its ADP requirements.

(2) Strategic Planning, as an Essential Element of Mission Primacy, Should Be Instituted

If satisfaction of mission needs is to be paramount, then strategic planning becomes vital as the mechanism for linking the recognition of need with the utility to fulfill that need. Since ADP represents a utility to support the organizational mission, the requirement to satisfy mission needs cannot be separated from the acquisition and management of ADP, and assignment of responsibility and authority must be consistent with that premise. Strategic planning is the link between the mission and the means to satisfy it, and is defined as accomplishing the following:

- Translates mission goals into ADP goals and objectives based upon changing technological, organizational, and political considerations
- Institutes a formalized disciplined approach to identifying needs beyond the immediate future (i.e., 2-7 years)

- Controls system growth to be compatible with mission growth
- Provides the basis for long-range, program-specific planning.
- Provides the basis for evaluating the effectiveness of the AF ADP program
- Formalizes communication of goals and objectives to external agencies and throughout the Air Force.

The next section addresses strategic planning more specifically in terms of the proposed revisions to the ADP acquisition process.

2. IN LIGHT OF THE MISSION PRIMACY OBJECTIVE, THE PROCESS MUST BE MODIFIED TO INCORPORATE FLEXIBILITY TO ACCOMMODATE CHANGING NEEDS AND ADAPTABILITY TO A CHANGING ENVIRONMENT

Regarding the acquisition process design (i.e., the steps which must be performed in order to acquire ADP), the analysis identified three major deficiencies which constrained satisfactory performance -- process inflexibility, the failure of the process to adapt to a changing environment, and the lack of systems and life cycle man- agement perspective. Correcting these major deficiencies will improve the process performance in terms of all three of the study objectives.

Making the process more flexible and incorporating systems and life cycle management approaches will reduce the acquisition lead time in two ways. First, varying the degree of management and control for programs of different complexity, as well as size, will lessen the review and approval time for many programs and will concentrate the oversight on fewer individual programs. Second, adopting a systems and life cycle perspective will reduce the total number of acquisitions which must be processed, and extend the useful life of the systems being acquired.

In terms of reducing technology lag, the increased flexibility will encourage users to enter the process sooner and replace ineffective and obsolete equipment

earlier. By making the process more adaptable to a changing environment, planners will take advantage of technological opportunities, (i.e., pre-planned system improvements) rather than reacting to existing capability needs.

Improving the requirements generation and approval process is an area where the process design recommendations will have considerable impact. The major intent is to reduce the time required and to improve the quality of decisions made during this phase of the process. The recommendations that follow address these improvements more specifically.

(1) Fundamental Changes Are Required in the Process Design

In order to correct the major deficiencies cited above and to achieve the objective of mission primacy, certain fundamental changes must be adopted in the acquisition process design. Five major changes are proposed.

- There must be a clear, strong and obvious linkage between Air Force mission planning and ADP acquisition program identification.
- The decision to approve a need should be made as part of funds approval in the PPBS.
- The decision to approve the ADP solution and the acquisition strategy should be separated from the need approval and delegated to a lower decision authority.
- The process design should be based on proven systems management practices:
  - Program Management System
  - Life Cycle Systems Management
  - Decentralized execution of the acquisition.
- Acquisition process regulations and procedures should be simplified to enhance understanding and encourage flexibility.

These changes, which conform with the major decisions announced by Deputy Secretary of Defense, Frank C. Carlucci, in April 30, 1981, (see ref. 12) are the basis for redefining the ADP acquisition process. This recommendation is presented in the following section.

(2) The Proposed Revision to the Process Demonstrates the Effects of These Changes

Many acquisition process models and descriptions were evaluated and compared with the process described by the AFR 300 series. Among these are the Systems Acquisition Process described by AFR 800 series, the DODD 5000.1 and DODI 5000.2 models as amended by the Carlucci decisions, and the A-109 approach. All are described in terms of major decision points (milestones) which, if approved, authorize the acquisition to proceed to the next major milestone.

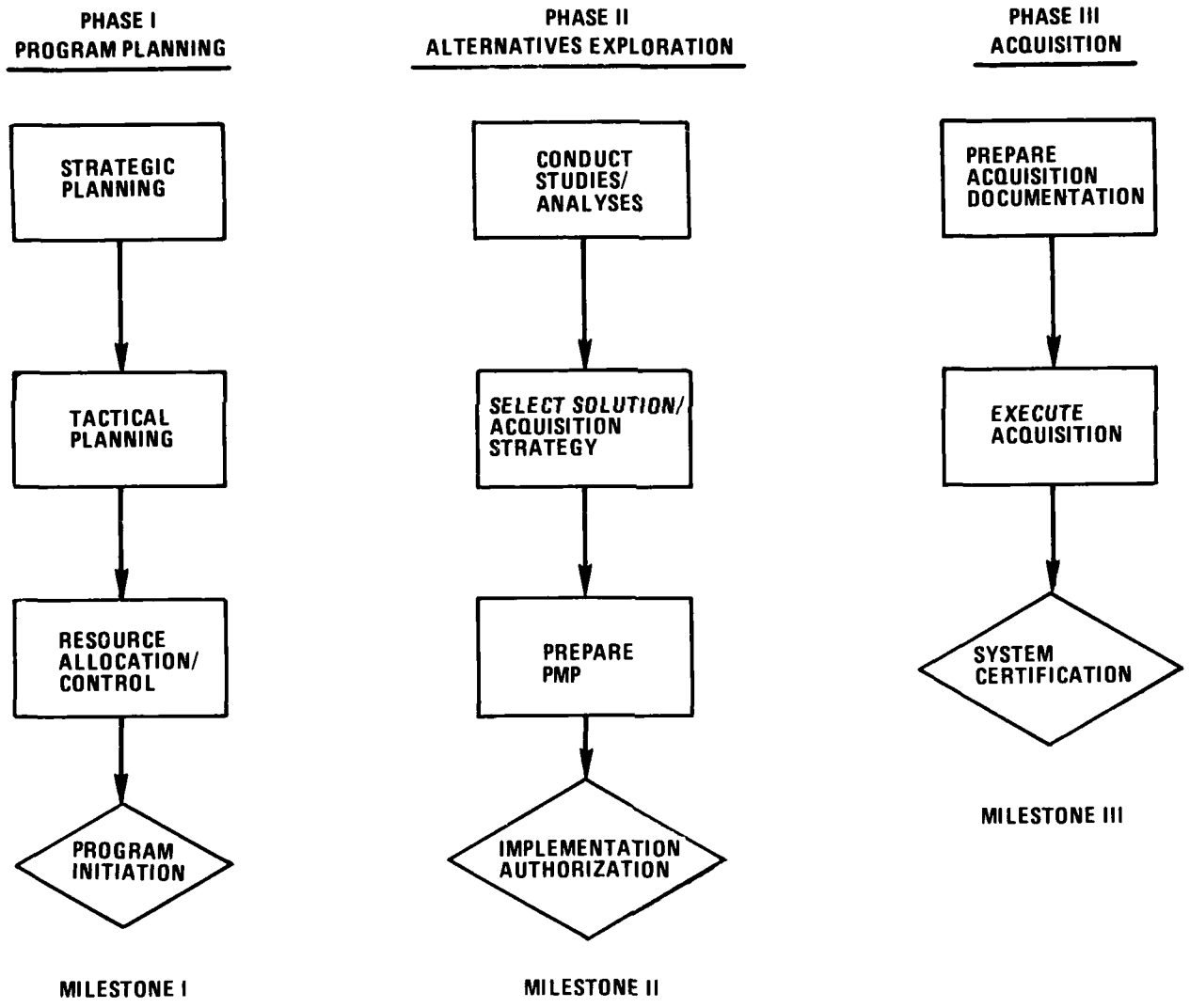
Using this framework to describe an acquisition process for ADP systems, it was determined that three major decisions are required in the process:

- To initiate an ADP program based upon an approved need
- To authorize implementation of an acquisition
- To accept the system or capability as satisfying the original need.

Figure V-1 depicts the overview of the proposed ADP acquisition process. Three phases are identified, each of which results in one of these major decisions -- program milestones.

- Phase I, Program Planning, defines the planning activities which lead to the identification and approval of ADP programs and result in Milestone I, Program Initiation.
- Phase II, Alternatives Exploration, defines the activities required to determine the appropriate solution and acquisition strategy of the approved program, and results in Milestone II, Implementation Authorization.

FIGURE V-1 PROPOSED ADP ACQUISITION PROCESS



- Phase III, Acquisition, includes the activities required to obtain or procure the needed capability or service. This phase ends in Milestone III, System Certification.

The following paragraphs describe each phase in more detail. To clarify what is being recommended, each will be presented in terms of the typical activities and decisions by the key participants, the required documentation, the phase objectives, and the resulting changes and improvements to the process.

1. Phase I Is Described As Program Planning

Table V-1 presents the major activities of this phase in terms of the typical activities and decisions by the key participants. It also presents the required documentation corresponding to each of the activities and decisions.

The overall objective of this phase is to conduct the requisite planning and related activities to define and initiate an ADP program. The specific phase objectives are:

- To define ADP goals and objectives for the Air Force and for the operating levels within the Air Force
- To identify plans and programs to accomplish these ADP goals and objectives
- To plan and allocate resources needed to support specific ADP programs
- To initiate programs to satisfy approved needs.

Phase I corresponds to the pre-DAR activities of the current ADP acquisition process. It parallels the budget process which commences with the release of the Air Force ADP Plan in March through the submission of MCAPs in October. The major changes proposed in this phase are designed to provide a more mission-oriented focus to the process, to appoint a program manager earlier in the process in order to influence key decisions, and to provide the Single Manager with greater flexibility to initiate ADP programs. The following specific changes are recommended:

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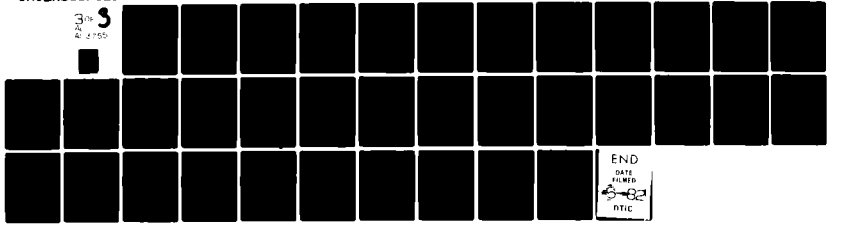

TABLE V-1
REVISED ADP ACQUISITION PROCESS PHASE I DESCRIPTION

PHASE I PROGRAM PLANNING	TYPICAL ACTIVITIES	DOCUMENTATION REQUIREMENTS PURPOSE/DESCRIPTION
STRATEGIC PLANNING	0 HQ USAF PREPARES ADP STRATEGIC PLAN 0 MAJCOM/SOA & STANDARD ADPS SINGLE MANAGERS PREPARE ADP STRATEGIC PLANS 0 CINC/COMMANDER APPROVES ADP STRATEGIC PLAN	0 HQ USAF ADP STRATEGIC PLAN – DEFINE AF ADP GOALS (2–7 YRS) – PROVIDE ADP TECHNOLOGY ASSESSMENT AS IT RELATES TO AF MISSION – COMMUNICATE CHANGES IN ADP POLICY & STANDARDS – PROVIDE SPECIFIC GUIDANCE FOR PPBS SUBMISSION 0 MAJCOM/SOA ADP STRATEGIC PLAN – SPECIFY PLANNING CONSIDERATIONS 1. MISSION GOALS, OBJECTIVES & TRENDS 2. TECHNOLOGY ASSESSMENT 3. ADP POLICY & STANDARDS ASSESSMENT – DEFINE ADP GOALS & OBJECTIVES 1. ORGANIZATION & MANAGEMENT GOALS 2. TECHNOLOGY FOCUS 3. FUNCTIONAL CAPABILITIES 4. STRATEGIES – CALL FOR MISSION NEEDS STATEMENTS
TACTICAL PLANNING	0 USERS/ ADP MANAGERS PREPARE MISSION NEED STATEMENTS 0 FUNCTIONAL MANAGERS VALIDATE MISSION NEEDS 0 MAJCOM'S/SOA'S REVIEW/RANK NEEDS 0 SINGLE MANAGER APPROVES PROGRAM & DETERMINES APPROPRIATE OPTIONS –AFR 800 vs. AFR 300 –EXEMPT vs. NON–EXEMPT –FUNDING ALTERNATIVE 1. FUNDED IN BUDGET YEAR 2. FUNDED IN PROGRAM YEAR 3. FUNDED IN +2 TO 7 YRS (PPBS SUBMISSION) 0 PREPARE LONG RANGE PLAN FOR PPBS SUBMISSION	0 MISSION NEED STATEMENTS – DEFINE NEED IN MISSION TERMS – PROVIDE PAR-TYPE FUNDING DATA 0 LONG RANGE ADP PLAN –MCAP TYPE DOCUMENT – DEFINES PROGRAMS IN + 2-7 YEAR – PROVIDES PROGRAM INPUTS FOR PPBS
RESOURCES ALLOCATION	WITHIN SINGLE MANAGER THRESHOLD 0 INITIATE PROGRAM 0 ASSIGN A PROGRAM MANAGER 0 ASSIGN APPROPRIATE RESOURCES 0 DEVELOP & APPROVE PROGRAM CHARTER	0 PROGRAM CHARTER – DEFINE SCOPE, OBJECTIVES, RESPONSIBILITIES & AUTHORITY – DEFINE SUBSEQUENT MILESTONES & LEVEL OF REPORTING
PROGRAM INITIATION	ABOVE SM THRESHOLD 0 SAME STEPS AS ABOVE EXCEPT PRECEDED BY AIR STAFF PMD	0 PROGRAM MANAGEMENT DIRECTIVE – DEFINED IN AFR 800-2
MILESTONE I		

- Greater emphasis on top-down ADP strategic planning, particularly in formulating strategic ADP goals and objectives at the operating levels

- The identification of needs in mission terms

- The approval of those needs as part of funds approval in the PPBS

- The initiation of an ADP program on the basis of an approved mission need prior to the selection of a solution and acquisition strategy.

These changes are presented in the Phase I description contained in Table V-1; however, the recommended change concerning strategic planning warrants further discussion.

The strategic planning recommendation requires changes at two organizational levels. First, the Air Staff must prepare ADP goals and objectives which are realistic and implementable. For example, the goal -- "to replace all obsolete equipment in the Air Force, within the next five years, where it is cost effective to do so" -- is one that can be achieved throughout the Air Force. This structured evidence of planning provides the basis for rational oversight management by presenting a clear message to external agencies concerning the intended direction of the Air Force ADP program. Such clearly defined and realistic goals provide the rationale for supporting or refuting proposed changes in Federal policies and ADP standards.

Secondly, at the MAJCOM and SOA level, there must be more active involvement in the strategic planning process. Implementation of this recommended change calls for the Single Managers to prepare operating level ADP strategic plans, which must be approved by the respective CINCs and Commanders. Effective strategic planning forces earlier identification of need and a better awareness of technological opportunities to support those needs. The long-term effect is to

reduce the number of unplanned requirements and improve the quality of ADP support in the Air Force, in addition to presenting an image of competent resource management to external oversight agencies.

2. Phase II Focuses on Alternatives Exploration

This phase performs the required studies and analyses necessary to determine the preferred ADP solution and the acquisition strategy. The activities, described in Table V-2, partially parallel the activities surrounding the preparation and approval of the DAR in the current ADP acquisition process. The changes and resulting benefits in this phase are described below:

- A major change is that an ADP program has been initiated and a program manager assigned prior to the evaluation of alternative solutions and strategies. The resultant benefit is that the program manager, who must eventually implement the technical solution and strategy decisions, can influence their outcome, thus establishing a greater degree of accountability in the decision making process.

- A second change, initiating a program prior to conducting the studies and analyses, also adds needed flexibility to the process. The directive document, either the program charter or the PMD, can tailor the requirement for studies to the complexity and the size of the program, thus eliminating redundant and unnecessary documentation.

- The separation of the decisions made in this phase from the need approval decisions made in Phase I is a third significant change. It allows the later decisions (technical solution and acquisition strategy) to be delegated to lower levels of authority, thus reducing the required approval time.

TABLE V-2
REVISED ADP ACQUISITION PROCESS PHASE II DESCRIPTION

PHASE I ALTERNATIVES EXPLORATION	TYPICAL ACTIVITIES	DOCUMENTATION REQUIREMENTS PURPOSE/DESCRIPTION
CONDUCT STUDIES & ANALYSES	0 PROGRAM MANAGER CONDUCTS STUDIES REQUIRED BY THE PROGRAM CHARTER OR PMD. EXAMPLES INCLUDE – ECONOMIC ANALYSES – FEASIBILITY STUDY – LIFE CYCLE COST ANALYSIS 0 PM OBTAINS APPROPRIATE COORDINATION	0 STUDIES & ANALYSES – DOCUMENTS THE RESULTS OF THE REQUIRED STUDIES & ANALYSES WHICH ARE THE BASIS FOR ALTERNATIVE SELECTION
SELECT SOLUTION/ ACQUISITION STRATEGY	0 PM SELECTS SOLUTION ALTERNATIVE & APPROPRIATE ACQUISITION STRATEGY 0 IF NON-EXEMPT SYSTEM PM PREPARES APR & DRAFT DPA	0 AGENCY PROCUREMENT REQUEST (APR) – REQUIRED TO OBTAIN GSA DELEGATION OF PROCUREMENT AUTHORITY (DPA) – SUMMARY OF STUDIES ATTACHED
PREPARE PMP IMPLEMENTATION AUTHORIZATION MILESTONE II	0 PM PREPARES PROGRAM MANAGEMENT PLAN 0 PM SUBMITS PMP TO APPROPRIATE AUTHORITY FOR APPROVAL 0 PM FORWARDS APR TO THE AIR STAFF 0 PMP APPROVED-AUTHORIZATION TO IMPLEMENT SOLUTION & CONDUCT ACQUISITION	0 PROGRAM MANAGEMENT PLAN – PROPOSED TECHNICAL SOLUTION – SELECTED ACQUISITION STRATEGY – PROGRAM MANAGEMENT APPROACH – SCHEDULE & REQUIRED RESOURCES

3. Phase III Concludes the Acquisition

Once implementation has been authorized, the objective of this third phase is to take action on the chosen technical solution in accordance with the approved acquisition approach. Table V-3 describes the activities of this phase.

Depending upon the strategy selected, the acquisition phase can be particularly lengthy, especially for competitive approaches. Many of the steps which contribute to this time period are dictated by Defense Acquisition Regulations and cannot be significantly shortened. Other procedures, such as benchmarking, are not dictated by the DAR, but their rigorous application also contributes to the lead time. The intent of the recommendations for this phase of the process is therefore to:

- Inject greater flexibility in the use of acquisition strategies
- Promote rational application of the procedures for a given acquisition strategy.

The most significant result is a carry-over from the changes in the previous two phases. That is, a single program manager who maintains managerial, technical, and financial responsibility for the ADP program is held accountable for the acquisition end-to-end, and at completion must certify the performance of the system to the user. It is through the program manager's continued involvement in the process that the acquisition cycle can be shortened in areas such as writing appropriate specifications and solicitation documentation, selecting the appropriate acquisition strategy, and tailoring procedures to obtain a balance of cost versus risk.

Many of the changes proposed in the acquisition process design require a reexamination of organizational roles and missions at all levels within the Air Force. This reexamination is the subject of the next major recommendation.

TABLE V-3
REVISED ADP ACQUISITION PROCESS PHASE III DESCRIPTION

PHASE III ACQUISITION	TYPICAL ACTIVITIES	DOCUMENTATION REQUIREMENTS PURPOSE/DECISION
PREPARE ACQUISITION DOCUMENTATION	0 PM IDENTIFIES SUPPORT REQUIREMENTS 0 PM PREPARES DOCUMENTS AS SPECIFIED IN THE APPROVED PMP. –VARIES WITH THE ACQUISITION STRATEGY SELECTED – DOCUMENTATION REQUIREMENTS SPECIFIED IN APPROVED PMP	0 ACQUISITION DOCUMENTATION – TECHNICAL DOCUMENTATION SUCH AS SPECIFICATIONS TECHNICAL DESCRIPTION, etc. – PROCUREMENT DOCUMENTATION SUCH AS SOW'S, SOLICITATION DOCUMENTATION, etc. – MANAGEMENT DOCUMENTATION UPDATES TO PMP/PMD, MOU's, etc.
EXECUTE ACQUISITION SYSTEM CERTIFICATION MILESTONE III	0 PM OBTAINS REQUIRED SUPPORT PERSONNEL (eg. CONTRACTING SUPPORT) 0 PM EXECUTES ACQUISITION IN ACCORDANCE WITH PRESCRIBED DAR REQUIREMENTS & PROGRAM DIRECTION. TYPICAL ACTIVITIES INCLUDE; – SELECTION OF SOURCE – NEGOTIATION & AWARD – PERFORMANCE OF REQUIRED EFFORT 0 PM CERTIFIES SYSTEM PERFORMANCE 0 PM TRANSITION RESPONSIBILITY TO O&M MANAGER	

3. INTERNAL ROLES, RESPONSIBILITIES, AND ORGANIZATIONAL MISSIONS MUST BE MODIFIED TO ACCOMMODATE CHANGES IN THE PROCESS

Concerning the people who must function within the process, the analysis identified four major deficiencies which constrain the effective acquisition of ADP -- the mismatch of roles and skills, the inconsistencies in the management and organization for ADP, the lack of end-to-end accountability, and the lack of effective leadership and guidance. These deficiencies, in conjunction with the recommended changes to this process, affect the roles, responsibilities, and organizational missions at all levels within the Air Force, and necessitate changes in three areas:

- The role of the MAJCOM/SOA ADP single manager and associated organizations
- The role of the Deputy Commander for Data Automation (AFCC) and subordinate AFCC centers
- Roles and responsibilities for Headquarters USAF organizations.

Before discussing each of the above, two general comments must be made. The first concerns organizational change. A major consideration for this recommendation is to minimize the organizational impact. The changes proposed in this section are, for the most part, changes in roles and responsibilities rather than organizational realignments. The majority of changes recommended to this point can be instituted within the current organizational framework. However, certain organizational realignments, particularly at the Air Staff, are inevitable in the long run. Legislative changes, such as the passage of Public Law 96-511, the language in the proposed 1982 DOD Authorization Bill on "exempt vs non-exempt ADP," technological trends such as the merging of telecommunications and ADP, and other political trends are the catalysts for the current rethinking of the organizational structure at the highest levels within the Air Force.

The second general comment concerns the issues of training and the retention of qualified personnel. Both are problems facing the military in many technological fields, and ADP acquisition is no exception. The limitations of skilled, qualified personnel account for many of the delays in acquiring ADP. While simplifying

the process and making more effective use of these limited human resources will improve the situation to some extent, there can be no substitute for a firm commitment to training in the areas of planning, acquisition, and management of ADP resources.

(1) Adopting the Program Management System Requires an Expansion of Roles at the MAJCOM/SOA Level

Fundamental changes in the process design include the adoption of a program management system and a controlled decentralization of the execution of the ADP acquisition process. The program management system entails appointing a program manager earlier, increasing his authority, and making him accountable for the program throughout the acquisition life cycle. To accomplish this, the role of the MAJCOM and SOA ADP Single Manager must be strengthened, and additional support skills are required.

1. Strengthen the Role of the Single Managers

Strengthen role of the single managers in three areas:

- Increase the approval thresholds of the single managers
- Give single managers greater authority to reallocate funds
- Expand their authority to initiate programs.

The approval thresholds for the MAJCOM/SOA Single Managers and the Standard ADPS Managers were recently increased to include the approval authority previously held by USAF/ACD. This now gives single managers approval authority for purchases up to $5 million competitive and $500,000 sole source (reference Table II-1). Initiatives are underway to give the single managers more authority to reallocate funds.

Table V-4 describes the proposed maximum thresholds for program initiation. If implemented, these thresholds will further enhance the single manager's authority. Three changes are noted in establishing the threshold criteria.

TABLE V-4: PROPOSED MAXIMUM THRESHOLDS

THRESHOLD CRITERIA		AUTHORITY	
LIFE CYCLE COST	PPBS CYCLE	MISSION NEED VALIDATION/APPROVAL	PROGRAM DIRECTION/INITIATION
≥ $50M	IN CYCLE	PPBS	SECRETARIAT
≥ $50M	OUT OF CYCLE	AIR STAFF	SECRETARIAT
< $50M	IN CYCLE	PPBS	MAJCOM/SOA
$25M - $50M	OUT OF CYCLE	AIR STAFF	AIR STAFF
< $25M	OUT OF CYCLE	MAJCOM/SOA	MAJCOM/SOA

- First, threshold levels are based on system life cycle cost rather than hardware cost to reflect a change in emphasis in the process.

- Second, since program approval is tied to funds approval in the PPBS process, the thresholds change depending on whether the requirement is processed within the PPBS cycle and those out of cycle.

- Third, since program approval and initiation occur prior to solution approval and acquisition strategy formulation, competitive versus non-competiive acquisitions are not a criteria in the threshold determination. These and other decision and review levels are determined by the level of program milestone reporting specified as part of program direction.

These thresholds are intended as maximum guidelines for program approval. They are below the DODI 7920.1 thresholds* for major systems, and are not intended to be applied equally to all MAJCOMs and SOAs. Thresholds for individual MAJCOMs/SOAs should vary. Considerations should include such items as the level of ADP sophistication and use, the size and mission of the organization, past performance in conducting acquisitions, and the effectiveness of strategic planning. The actual secretariat approval thresholds should be established at a point that provides appropriate visibility to each of the major commands and encompasses approximately 5 percent of the total Air Force ADP Program.

Accompanying the increased single manager's approval threshold should be the increased flexibility to reallocate funds and initiate programs. This, too, is an area where progress has

* DODI 7920.1 defines major systems as those greater than $100 million program acquisition life cycle or greater than $25 million in any single year.

been made. Single managers have the authority to reallocate funds within Program Elements and certain Element of Expense Investment Codes (EEIC's). This flexibility is paramount for the single manager to be able to reallocate funds to initiate programs for higher priority needs within the budget and program years.

2. Expand Skills and Resources

To fully execute an acquisition program using program management system procedures, additional support is required at the MAJCOMs/SOAs. Skill levels in certain disciplines must be enhanced and made available to the program manager. These areas were described in Chapter IV as those disciplines required for certain AFR 300 series acquisitions, but which are not explicitly provided. They include:

- Program management and planning
- Systems engineering
- Logistics support
- Configuration management
- Computer resource integration
- Operational planning
- Test and evaluation.

For those MAJCOMs and SOAs with recurring acquisition programs requiring these types of disciplines, personnel with these skills should be under the direction of the single manager. For others, these skills should be made available through AFCC centers or other centralized sources.

Similarly, procurement support should be made available to the single managers. Contracting support capable of conducting competitive ADP acquisitions should be established at bases where the need is warranted. Where the volume is not large enough, procurement support should be made available through AFCAC or other regional ADP procurement offices to be established.

(2) The Deputy Commander for Data Automation (AFCC) Should Have Primary Responsibility for USAF Standard ADPS's, and Support Responsibilities to the MAJCOM/SOA Single Managers

AFCC is the center of expertise for the acquisition, management and operations of ADP resources.

Within the AFCC centers, under the direction of the Deputy Commander for Data Automation, are areas of expertise which are limited elsewhere in the Air Force. Making effective use of this expertise is critical to the success of the Air Force ADP Program.

The primary role for the AFCC centers, with the exception of AFCAC, is to support the USAF Standard Systems. This role should remain unchanged. However, to make more effective use of these talents, they should be made available to support the MAJCOM/SOA non-standard systems on an as-needed basis. Such support should be made available at the request of a program manager and should be in the form of a program management review team or an acquisition consultant team to assist with such tasks as:

- Conducting required studies and analyses, including requirements analyses, feasibility studies, and software conversion studies
- Formulating acquisition strategy
- Developing specifications and related technical documentation
- Preparing solicitation documentation
- Assisting in source selection
- Supporting in-house software development activities
- Supporting live test demonstrations (LTDs) and other testing activities.

Concerning the AFCC ADP roles, an area deserving special consideration is the support provided by the Air Force Computer Acquisition Center (AFCAC). AFCAC serves as the centralized ADP selection office and provides other program management support functions during the acquisition process. To make best use of this limited expertise, AFCAC's role should be reduced to specialized support functions of the acquisition process in the following areas:

- Provide contracting and source selection support to USAF standard systems and to MAJCOM/SOA systems above a certain threshold (e.g., $25M) or at their request

- Assume primary responsibility for technology forecasting and ADP standards evaluation

- Provide acquisition assistance to program managers at their request.

These modifications in AFCAC's role will make most effective use of their expertise.

(3) Adoption of the Preceding Recommendations Requires a Reallocation of Roles and Responsibilities on the Air Staff

A major conclusion of this study is that the Air Force ADP management structure and organization contributes to the confusion and thus the delays in acquiring ADP. Of particular concern is the apparent uniqueness in the management and acquisition of general purpose ADP compared to other systems and resources. There was near universal criticism that this unique management stucture for ADP is responsible for much of the confusion and results in little value added to the acquisition process. Opinions concerning how to improve this situation are not as universal. Suggestions range from establishing a separate DCS for information systems to shifting certain areas of responsibility within existing organizations.

Concerning ADP management, four areas of responsibility were described in Chapter IV as being anomalous to the rest of the Air Staff:

- ADP Contracting & Acquisition
- ADP Requirements
- ADP Operations
- ADP Support.

Each area was examined in terms of three broad roles which reflect the types of functions performed by most organizations on the Air Staff:

- Policy Formulation and Promulgation
- Resource Management
- Control and Oversight.

The first step in the analysis of roles and responsibilities was to identify and define the ADP functions in each area and determine where those functions are

duplicated in other Air Staff organizations. The result of this first step is presented in Chapter IV as part of the study conclusions. The second step was to determine where these functions are best performed on the Air Staff. To make this determination, the following criteria were established:

- Are the functions consistent with other functions performed by that organization?
- Does the organization possess the skills and resources necessary to perform those functions?
- Can the organization adapt to changing technological and political environments?
- Is the impact on current organizations minimized?

An additional technological issue was also considered. Should responsibilities for ADP, telecommunications and other information systems technologies be consolidated, or should they remain separate? Ignoring the political ramifications of such a decision for the moment, there are compelling reasons why these technologies can no longer be considered separately.

- From a technological viewpoint, the technologies are merging to the point that there is little distinction among them. These differences are made more in terms of their application than their capabilities. Further, interface points are becoming increasingly difficult to establish.
- From a management viewpoint, the trends toward decentralization and mission orientation support their consolidation.
  - The decentralized execution of the acquisition process requires a less specialized technological focus in a centralized management organization (i.e., the Air Staff).
  - A mission orientation and a systems approach to the acquisition process

requires that consideration be given to all the information technologies as potential solutions. Early consideration of one aspect of technology over another constrains the solution.

Recognition of the technological merger of ADP and other information technologies is widespread in the technical and business literature, and has been reaffirmed in the last decade by many studies and reports. In notable instances, study teams have taken the additional step of recommending the functional merger of the information technologies for managerial and/or policy control, and policy and legislation have been supportive. The 1972 establishment of ADTS within GSA recognized the growing interface between ADP and telecommunications by consolidating direction and coordination functions for ADP and communications. In 1977, the Commission on Federal Paperwork (see ref. 13) recommended that the President consolidate the dispersed and fragmented major paperwork, information and communications-related policy oversight functions and authority under central management direction and leadership. In that same year, the Privacy and Protection Study Commission (see ref. 14) reported that data communication systems had become inextricably involved with data processing systems. The 1978 Report of the Federal Data Processing Reorganization Project of the President's Reorganization Project (PRP) brought to light numerous deficiencies in Federal ADP management and made a wealth of recommendations to alleviate the perceived problems. The Central Agencies Team of the PRP (see ref. 15) noted the inattention to the confluence of computers and communications as a major deficiency and the General Government Team Report (see ref. 16) found inadequate linkage between information processing and telecommunications in terms of long-range planning and systems design and development. The National Security Team (see ref. 17) recommended that information technology, to include <u>all</u> computer/telecommunications activity, be elevated to a recognized Air Staff level function, commensurate with its importance as a resource.

The December 1980 Evaluation of the GSA by a Panel of the National Academy of Public Administration (see ref. 3) faulted GSA ADTS for managing ADP and

telecommunications separately, despite their technological merger. GSA, however, recently reorganized, creating an Office of Planning and Policy to manage both ADP and telecommunications. The Paperwork Reduction Act, PL 96-511, consolidates authority for policy related to management of all information resources, including telecommunications, in OMB. Additionally, the proposed Federal Procurement System (FPS) calls for a comprehensive, uniform, integrated Government-wide system for procurement of goods and services to reduce fragmentation of policies, regulations, and procedures.

As a result of this evaluation the following recommendations are made concerning the realignment of roles and responsibilities for the management of ADP on the Air Staff.

1. Future Consideration Should Be Given to Consolidating the Responsibilities for the Management of Telecommunications, ADP, and Computer Based Office Systems

For the reasons cited previously, it is important to consider any change in roles and missions in light of the inevitable merger of the information technologies. Since the focus of this study was limited to ADP resources, the procedures for managing telecommunications (currently under AF/XOK) and for office systems (currently under AF/DA) were not examined to the same level of detail. Thus it is difficult to determine the political impact of such an organizational realignment. However, it is recommended that these three areas of information technology be managed within the same structure, and the same body of regulations, consistent with those proposed for the management and acquisition of ADP in the following section.

2. Responsibility for the Management of ADP Should Be Consistent With the Organization of the Air Staff

Organizational consistency is a driving consideration in the assignment of roles at the Air Staff. The major changes proposed for the process design are not new concepts, but rather ones

which are currently being used successfully in other Air Force acquisition processes. Policies and procedures currently exist to implement concepts such as the Program Management System, mission-oriented needs statements, life cycle and systems management, and a decentralized execution of the acquisition process. These policies and procedures should not be redeveloped, but rather adopted as the procedures which govern the ADP acquisition process.

In addition to consistency, and in keeping with the goals for the process recommendations, the following goals were considered in formulating organizational recommendations:

- Maintain a simplified but disciplined structure for the management of exempt systems.
- Maximize the commonality in procedures for exempt and non-exempt systems.
- Capitalize on existing procedures.
- Encourage organizational decision-making which fosters technological fusion of ADP, telecommunications and office systems.
- Make most effective use of people and skills.

Table V-5 describes the proposed reallocation of ADP roles and responsibilities. The table identifies those responsibilities for which AF/ACD currently has responsibility. Since there are no changes proposed in the role of the functional OPR on the Air Staff, these organizations have been omitted from the table. Recommendations concerning the other ogranizations involved in the management and acquisition of ADP are as follows:

- Contracting and acquisition responsibilities should be assigned to AF/RDC.
- Responsibilities concerning the generation, approval and management of requirements should be distributed within AF/RD.

TABLE V-5

SUMMARY OF AIR STAFF ROLES AND RESPONSIBILITIES FOR THE MANAGEMENT OF ADP RESOURCES

ROLES	AREAS OF RESPONSIBILITY (DCS)			
	ACQUISITION (RD)	REQUIREMENTS (RD)	OPERATIONS (XO)	SUPPORT (LE)
POLICY FORMULATION AND PROMULGATION	* CONTRACTING . CONTRACT ADMIN . SOURCE SELECTION . INDUSTRY RELATIONS	* TECHNOLOGY STANDARDS * REQUIREMENTS GENERATION AND APPROVAL * PROGRAM MGMT. * SYSTEMS ENG. * TEST & EVAL.	* OPERATIONS * FACILITY MANAGEMENT * SECURITY AND PRIVACY	. SUPPLY . R / M / A * CONFIGURATION MANAGEMENT * REUTILIZATION * LIFE CYCLE COSTING
RESOURCE MANAGEMENT	. CAREER FORCE MANAGER-65XX	* PPBS SUPPORT (DAP) * CAREER FORCE MANAGER-51XX . CAREER FORCE MANAGER-27XX, 28XX, 29XX	. PEM FOR MULTI-USER SYSTEMS * FUNCTIONAL VALIDATION FOR MULTI-USER SYSTEMS	* INVENTORY MANAGEMENT . SUPPLY
CONTROL AND OVERSIGHT	* CENTRALIZED & DECENTRALIZED CONTRACTING SUPPORT	* GSA INTERFACE * STANDARDS DEVELOPMENT * STRATEGIC PLANNING * PROGRAM DIRECTION * TECHNOLOGY ASSESSMENT	* USAF STANDARD SYSTEMS AND MULTI-USER SYSTEMS OPERATIONS * STRATEGIC PLANNING INPUTS	. ADP TABLE OF ALLOWANCES . SUPPLY * REUTILIZATION PROGRAM

* AF/ACD CURRENTLY MAINTAINS PARTIAL OR TOTAL RESPONSIBILITY

- Operational responsibilities for ADP systems should reside within AF/XO.

- Certain ADP support responsibilities should be assigned to AF/LE.

In terms of implementation, the ordering of the above recommendations is critical. Where there are compelling reasons for consolidating ADP contracting and acquisition responsibilities in AF/RDC, there is a less urgent need for the other proposed functional realignments; however, long range plans should consider these recommendations as the preferred alternatives. The following paragraphs summarize the rationale supporting these proposed alternatives.

(1) ADP Contracting and Acquisition

There are compelling reasons for AF/RDC to assume contracting and acquisition responsibilities for ADP (i.e., promulgating policy and guidance in the areas of source selection, contracting, and contract administration). Plans are currently in progress to transition this responsibility. There should be one, single source for contracting and acquisition policy and guidance -- The Defense Acquisition Regulations. Attempts to separate the special Federal requirements imposed on ADP have had an adverse effect on the process.

(2) ADP Requirements

There are three reasons why AF/RD is considered the best alternative for assuming the responsibility for policy, direction and control of ADP requirements (i.e., managing the process for generating and approving ADP requirements, issuing program direction, and satisfying the requirements through system engineering and acquisition procedures). Included in this area of responsibility is the interface with GSA required for non-exempt systems:

- First, AF/RD currently is the OPR for policy governing requirements definition, approval and management. Many of the procedures being proposed in the revised process, such as the program management, systems engineering, and test and evaluation procedures, fall with the scope of control of AF/RD.

- Second, the career force manager for many of the disciplines required in the revised process is AF/RD.

- Third, AF/RD is considered the technology manager responsible for technological planning and development. While these activities have been restricted to research and development, advanced development, and production systems, RD is in the best position to assume a similar role for commercial ADP.

Alternatively, consideration was given to both AF/XO and AF/ACD for this area of responsibility. In both cases it would mean maintaining separate structures for exempt and non-exempt systems, as well as separate procedures. (At this writing, the responsibility for management of exempt systems has not been established. There are indications that this responsibility will be established under SAF/AL and that AF/RD is a likely candidate to assume that role.)

(3) ADP Operations

Within this area of responsibility, there is little proposed change to existing roles and responsibilities. The two significant areas of change are:

- AF/XO should be responsible for establishing operational policy concerning the employment of ADP systems in the Air Force.

- USAF/XO should act as the functional OPR for multi-user systems.

These are both areas in which they are now responsible for telecommunications and in which they are in a position to assume responsibility for ADP with very little impact.

(4) ADP Support

The final area of responsibility concerns the items of supply and inventory management responsibilities for ADP. Many argue that AF/LE, as personal property managers for the Air Force, already possess this responsibility for ADPE management. The specific recommendations in these areas are as follows:

- Responsibility for the reutilization and sharing programs, currently managed by AF/ACD should transition to AF/LE.

- Configuration management and life cycle costing procedures, currently AF/LE responsibilities, should be consistently applied to ADP.

- Tables of allowance should be established for certain classes of ADPE and should be an alternative to the requirements generation and approval process. (Consideration is currently being given to this approach in USAF/LEY.)

The recommendations discussed to this point address problem areas within the Air Force's ability to change. While these areas are of major concern in this study, they cannot be addressed without considering the impact of the external environment. The next section addresses the recommendations concerning organizations external to the Air Force, and their relationships to the Air Force.

4. EXTERNAL TO THE AIR FORCE, PREVIOUS RECOMMENDATIONS SHOULD BE COMPLEMENTED BY CHANGES IN POLICY AND MODIFICATION OF ORGANIZATIONAL ROLES AND RELATIONSHIPS

The recommendations to this point have focused on actions internal to the Air Force. This is consistent with the study conclusion that although there are externally imposed constraints, many of the obstacles to an efficient ADP acquisition process can be overcome within the scope of AF authority. However, achieving maximum benefit from the process improvements requires some attention to the external organizations which influence the process -- principally OSD.

The time is right for promotion of positive change in the ADP acquisition process. Recent initiatives indicate that the Federal regulatory environment is receptive to acquisition reform. The Deputy Secretary of Defense, Mr. Frank Carlucci, announced on April 30, 1981, (see ref. 12) that DOD has initiated major changes both in acquisition philosophy and in the acquisition process itself. Executive agency reform proposals such as the Federal Procurement System (FPS), recent revisions in FPRs and FPMRs, and organizational changes at OMB and GSA reflect the willingness to address the persistent problems in Federal acquisition and information resources management. Congressional awareness of the need to act is indicated by the passage of the Paperwork Reduction Act, PL 96-511, and the Senate's inclusion of legislative reform in the 1982 DOD Appropriations Bill.

Opportunities exist to correct many of the problems that have constrained the acquisition process for years. The preceding recommendations of this chapter describe opportunities to implement changes within the Air Force. To complement these changes, the Air Force should forward for review and adoption at OSD a set of recommendations which are conceptually similar to those proposed in this chapter.

It is felt that the Air Force can most successfully promote change external to the Air Force to the extent that it can influence OSD to enact reforms and represent DOD interests at the Federal level. Toward this end, the Air Force should concentrate on encouraging OSD to take a stronger, more active and visible role in Federal ADP matters. Consistent with the strategy recommended in this chapter, the Air Force should encourage OSD to:

- Adopt consistent realignment of roles and responsibilities within DOD similar to the realignments proposed for the Air Force.

- Simplify DOD directives and instructions and ensure consistency with Federal ADP policy and acquisition regulations.

- Regain credibility with Congress through improved relations and demonstration of competent ADP resource management.

- Assume a more dynamic role in relations with Congress, OMB, and GSA to assert DOD influence on Federal ADP policy formulation, particularly respecting the implementation of PL 96-511 and the FPS.

These initiatives, coupled with the Air Force's own efforts to improve the acquisition and management of ADP, will have the greatest impact on reducing the constraints imposed by the external environment.

* * * * *

The above recommendations were designed such that, taken in aggregate, they represent the full set of integrated strategies needed to correct the deficiencies in the ADP acquisition process and to achieve the study objectives. The specific implementing actions are delineated in the next chapter. As stated earlier, the order of the recommendations is important -- the first being the most critical in terms of acceptance and implementation. The next chapter further defines this ordering through the sequence of actions needed to implement these recommended strategies.

VI. IMPLEMENTATION APPROACH

VI. IMPLEMENTATION APPROACH

The implementation approach is based on taking the whole set of recommendations and implementing them in an order that recognizes that the ADP process is an ongoing effort, with many activities keyed to the PPBS. The total effect of the recommendations will be felt after the last implementation step has been completed. At this point it is realistic to anticipate that all recommendations could be implemented in time to affect the FY85 budget call. On the other hand, since the acquisition process is ongoing, various recommendations may be expected to impact the process as soon as they are implemented. Implementation of recommendations that eliminate whole steps in the process obviously shortens the acquisition process; raising the dollar approval threshold keeps more programs out of the HQ USAF staffing cycle. The benefits of planning and training are more long term.

Implementation of organizational changes is recognized as a sensitive area. As mentioned in the preceding chapter, it is possible to implement the process changes without changing the existing organization for ADP acquisition. However, many factors previously discussed appear to make organizational change inevitable. Only slightly less sensitive than organizational changes per se are changes in roles and responsibilities. The implementation of such changes is, in some cases, closely linked to organizational changes; however, in most cases it does not affect the overall organizational mission.

The use of the Air Force Acquisition Improvement Group (AIG) to implement these recommendations is key, if not critical. They have the advantage of the knowledge and the insight gained from being able to step back and view the process with a critical yet constructive eye. Through their close interaction with the multitude of participants in the process, they have a firsthand knowledge of the many problems in processing ADP acquisitions.

This chapter is not an implementation plan. It is a recommended implementation approach; detailed implementation plans would be required before proceeding with the various steps. Implementation will be addressed here in terms of:

- The ADP acquisition process
- The realignment of roles and responsibilities
- The activities of the AIG.

The implementation steps that follow are presented in their recommended sequential order.

1. IMPLEMENTATION OF THE REVISED PROCESS REQUIRES A SERIES OF STEPS THAT RECOGNIZE THAT THE ADP ACQUISITION PROCESS IS ONGOING

The following are the steps required to implement the process recommendations proposed in Chapter V.

(1) The First Step Should Be To Brief External Agencies

The Air Force ADP acquisition process interfaces with a number of organizations at both the policy and operating levels. It is important that the Air Force acquaint these organizations of the impending changes for two reasons:

- At the policy level it is important that ASD(C) and OMB know what changes are anticipated, that the changes are being made within the framework of existing Federal policy, and that they are aimed at improving the Air Force ADP acquisition process. This same briefing could be used as an opportunity to float some "trial balloons" on policy changes that the Air Force would like to see occur to further enhance the ADP acquisi- tion process. During the course of this study, the Air Force Acquisition Improvement Group has briefed most of the Federal organ- izations involved in ADP acquisition on the purpose and status of the study and, without exception, all organizations have expressed an interest in hearing the results.

- At the operational level, it is important that organizations like GSA, which have regular interface with the Air Force on APR/DPA matters, be made aware of proposed Air Force changes.

These external briefings could afford the Air Force an excellent opportunity to foster the concept of "earned autonomy." Even though a significant number of ADP acquisitions will be exempt from GSA and to some

extent HGOC review and influence, there still remain those non-exempt acquisitions that will require external review.

(2) Program Managers Should Be Appointed For All Programs That Have Survived the PPBS Process

The early appointment of program managers is essential in establishing program accountability. As such, program managers should be appointed for programs that have survived the PPBS as soon as one can be identified. Three specific steps should be taken:

- Provide interim guidance to the single managers on their enhanced role and authority to appoint program managers.
- Strengthen the program manager's role by:
  - Issuing HQ USAF/ACD policy statement to the field
  - Revising DPDs where appropriate
  - Requiring MAJCOM/SOA single managers to develop program manager charters
  - Reemphasizing AFCAC'S role to support the program manager.
- Institutionalize single managers procedures for reducing documentation for ADP programs that are within single manager approval authority. Many single managers had previously instituted "mini-DAR" procedures within their organizations for small programs. These mini-DAR procedures should be reexamined by the single managers in the light of all the pending changes to the acquisition process, and, with the appropriate changes, should be institutionalized.

The implementation of the above changes will have the most immediate impact on improving and accelerating the ADP acquisition process as it can immediately affect those proposed acquisitions that are already in process.

(3) HQ USAF Should Now Start Developing Planning Guidance for the FY85 Budget Call

FY85 is the earliest budget year that can be totally affected by the new procedures, particularly concerning the strategic planning done by the MAJCOMs. The FY85 guidance should be developed in three areas:

- HQ USAF should develop and publish the strategic planning guidance for the MAJCOM/SOAs.
- HQ USAF/ACD should prepare the Air Force ADP Strategic Plan.
- HQ USAF/ACD should develop the format and publish the instructions for preparing mission need statements for input to the Long Range Plan (current MCAP).

Until the above actions have been completed, the MAJCOM/SOAs will not be able to take the next step.

(4) The MAJCOM/SOAs Should Implement the New Planning Guidance.

Based upon improved strategic planning and using the HQ USAF Strategic Plan, the MAJCOM/SOAs should prepare to respond to the FY85 budget call.

- MAJCOM ADP strategic plans should be prepared.
- Mission need statements should be prepared and submitted, using the existing MCAP process.

The Air Force panels that operate as part of the PPBS will have to be instructed that if a mission requirement survives the PPBS review it will not be formally presented to the Air Staff again for requirements review (i.e., no DAR processing) unless it exceeds newly established thresholds.

(5) Current Air Force Regulations Will Have To Be Revised

The revisions will be required in three general areas, as follows:

- Regulations and guidance must be revised to provide ADP strategic planning guidance.

- The AFR 300 series regulations which define the acquisition process must be revised and simplified.

- Guidance must be developed to define acceptable alternative acquisition approaches.

Interim guidance should be provided to the field, in the areas deemed necessary, pending the completion of drafting and staffing of revisions to the regulations.

(6) Final Actions Are Necessary To Complete Implementation of the Revised Acquisition Process

Final implementation actions are required in three areas:

- The MAJCOMs/SOAs must identify the additional ADP and acquisition skills that are required to support the new acquisition concept. Reassignments must be made where possible within existing manpower resources. Shortages must be addressed by manpower procurement and training, within the Air Force total prioritization.

- MAJCOMs/SOAs should identify their training needs in the ADP and acquisition support skills.

- HQ USAF should establish a program to monitor and evaluate the process performance and to make changes as appropriate.

Taking these steps will enhance the successful implementation of the strategy recommended in Chapter V.

2. REALIGNMENT OF ROLES AND RESPONSIBILITIES SHOULD BE ACCOMPLISHED AT HQ USAF AND MAJCOMs/SOAs

As discusssed previously, some changes in roles and responsibilities are mandatory in order to achieve the total benefits of the recommended changes in the process; other changes are highly desired. The following paragraphs address the sequence of actions required to effect changes in organizational roles and responsibilities.

(1) Strengthen the Single Manager's Roles and Responsibilities

To strengthen the single manager's role, the first implementation step in revising roles and responsibilities is to issue interim policy direction to:

- Authorize single managers to appoint program managers to programs for which funds have been approved

- Increase single manager's approval authority

- Raise the thresholds under which the single managers are authorized to approve ADP solutions and direct program implementations.

This interim direction should be followed by revised regulations which implement the total process revisions.

(2) The Role of AFCC in the ADP Acquisition Process Must Be Revised

The recommendations detailed a dual role for the AFCC centers--direct responsibility for multi-user systems, and support responsibilities as an acquisition consultant in support of MAJCOM and SOA program managers. The following implementation actions are required to clarify these roles:

- Issue interim direction that redefines the roles and responsibility of the AFCC centers.

- Direct AFCC to prepare a transition plan which revises the role of AFCAC and considers other organizational realignments.

- Revise AFCC's charter to provide increased acquisition support to MAJCOMs/SOAs.

(3) ADP Responsibilities Should Be Transferred From AF/ACD Into AF/RD, XO and LE, as Appropriate

A phased implementation of these responsibilities is encouraged. AF/ACD should remain intact as long as possible to effect a smooth transition. Transfer of responsibilities should be accompanied by an appropriate transfer of resources.

- Direct AF/ACD to take the lead in developing a transition plan with RD, XO and LE.

- Direct the assumption of the responsibilities by RD, XO and LE upon approval of the transition plan.

This transfer of responsibilities should coincide with the next step as much as possible, but neither step should be allowed to be a reason for delaying the other step.

(4) Transition the ADP Acquisition Executive Responsibilities From SAF/FM to SAF/AL

The completion of this last step will complete the changes at HQ USAF and will result in the responsibilities at the SAF and Air Staff being similarly aligned for ADP acquisition.

3. SPECIFIC ACTIVITIES ARE REQUIRED BY THE ACQUISITION IMPROVEMENT GROUP (AIG) TO IMPLEMENT THE RECOMMENDATIONS

Because of their expertise acquired during this study, the AIG personnel are the best qualified to handle many of the implementation actions. They have a depth of background information and are not encumbered by any assigned duties other than this study.

(1) The AIG Should Take Certain Implementing Actions

Specific implementing actions for the AIG are as follows:

- Brief selected external agencies on the results of the study.
- Brief MAJCOMs/SOAs and Centers on the results of the study.
- Develop the interim guidance for the MAJCOM/SOA Single Managers.
- Develop planning guidance.
- Develop alternative ADP acquisition approaches.
- Revise the AFR 300 series regulations.
  - Incorporate the planning guidance.
  - Define the revised ADP acquisition process.
  - Define alternative acquisition approaches.
- Support the development of the plan to transition responsibilities from ACD to RD, XO, and LE.

- Support the development of directions for the realignment of responsibilities of the AFCC ADP centers.

The preceding implementation activities are within the skills and capabilities of the AIG personnel. During the study subjects were identified which require further study. These are described in the following section.

(2) The AIG Should Further Study and Analyze Certain Subjects

In addition to the implementation actions previously discussed, certain actions require further analysis to complete the implementation. Specific areas are as follows:

- Develop a life cycle model (LCM) for ADP systems.
- Define criteria for determining technological and economic obsolescence.
- Develop, analyze and recommend alternative ADP acquisition approaches.
  - Research and define alternatives.
  - Make recommendations.
  - Define applicability.
- Develop an ADP Program Manager's Handbook.
- Study and make recommendations on the need for the establishment of an Office of Information Technology in HQ USAF which would have responsibility for telecommunications, ADP and computer-based office systems.

The first three items above are needed to complete implementation of the recommendations. The study of the need for a single office to be responsible for telecommunications, ADP and computer-based office systems is not essential for the implementation of the ADP acquisition improvement study. However, with the present division of the three responsibilities within the Air Staff, together with the requirement to implement the Paperwork Reduction Act, PL96-511, it is appropriate to undertake such a study now.

* * * * *

Implementation actions can begin almost immediately but could extend over a period of several years before final regulation changes and field level OIs are formally published and distributed. However, the near-term implementations can be expected to produce near-term improvements in the ADP acquisition cycle, i.e., shorten the cycle. The implementation of the qualitative type of improvements in the acquisition process takes longer to be felt. The expertise of the Acquisition Improvement Group can be profitably utilized to make a smooth implementation.

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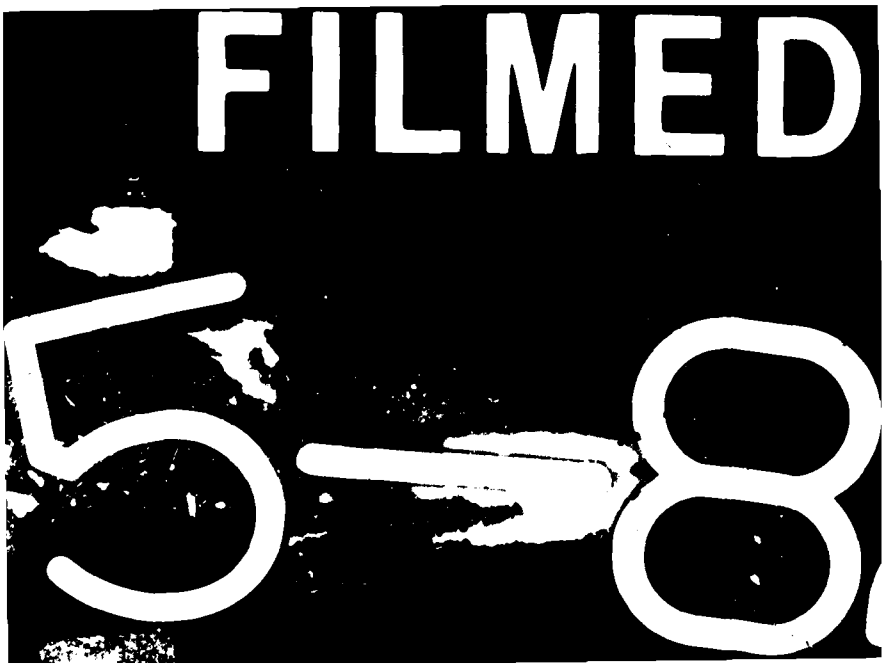
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