DEPARTMENT OF VETERANS AFFAIRS

INFORMATION SYSTEMS MARKET, 1991

INPUT

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Federal Information Systems and Services Program (FISSP)

Department of Veterans Affairs Information Systems Market

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Abstract

INPUT estimates the market for information systems and services at the Department of Veterans Affairs will increase from $300 million in 1991 to $417 million by 1996, at a compound annual growth rate of 7%.

Agency modernization and decentralization of information systems are driving the increase for vendor products and services at VA. The aging Vietnam-era veterans population is also pressuring VA to deliver additional services and benefits, causing additional strain on department information systems.

VA continues to be a vital market for vendors at local levels, although large-contractor opportunities appear to be limited. New technologies are also expected to play a vital role in department IS modernization directions. Vendor marketing efforts should stress knowledge of new technical skills that will assist in achieving IS objectives.

This report contains 148 pages, including 70 exhibits.

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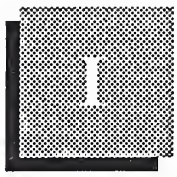
Exhibits (Continued)

Exhibits (Continued)



Introduction

The *Department of Veterans Affairs Information Systems Market* report is a component of INPUT's continuing series of market analysis reports focusing on key federal agencies and departments that are expected to play a major role in the federal information systems market. This study was undertaken as a result of client interest in the modernization of VA information systems, as well as in understanding the impact of department status on agency information systems. This report offers vendors insight into agency requirements, perceptions, and organizational structure. The report provides contractor guidance in developing marketing strategies that are effective in winning contracts to provide IS services to the Department of Veterans Affairs.

The *Department of Veterans Affairs Information Systems Market* report is part of INPUT's Federal Information Systems and Services Program (FISSP). Reports of this program are designed to assist INPUT's U.S. clients in satisfying future federal government needs for computer-based information systems and services.

The report's findings are based on research and analysis of several sources, including:

- OMB/GSA/NIST Five-Year Information Technology Plans for 1991-1996
- Interviews with leading information systems and services vendors at the marketing or corporate executive levels
- Interviews with VA Headquarters Policy officials, and VA policy and program management personnel
- VA's Information Systems Plan, FY 1989-1995
- Other VA internal documents

A

Scope

The period of interest for this report is GFY 1991 to 1996. Vendor interviewees were selected because they were identified as contractors of record for existing contracts with the agency or listed in INPUT's vendor analysis data base for 1990. Agency interviewees were identified with assistance from the VA Office of Information Resources Management (OIRM) and through referrals from respondents.

INPUT defines information systems and services in the following categories of vendor delivery modes for products and services (see Appendix B for detailed definitions of each category):

- Processing services
- Network services
- Software products
- Professional services
- Turnkey systems
- Systems integration
- Hardware

B

Methodology

The OMB/GSA/NIST Five-Year Plan was analyzed to identify programs to be initiated during the period of interest of this report and for information technology obligations of the agency. The VA's Information Systems Plan further clarified agency objectives and program initiatives that will rely on contractor assistance. Other VA documents were used to provide background information and to explain the current organizational structure and issues affecting IRM planning.

The agency questionnaire was designed to acquire data on VA programs, organization, issues and trends that are believed to impact the acquisition of information systems and services at the VA. The vendor questionnaire was designed to ascertain industry's perspective of the market for information systems and services at VA. For comparison purposes, similar questions were asked of agency personnel and vendors. Questionnaires developed for agency and vendor respondents are included in Appendix F.

INPUT interviewed the following department personnel:

- OIRM policy officials
- Policy and program management individuals from the three VA administrations located at headquarters

Industry respondents selected for interview included marketing executives and corporate executives.

C

Report Organization

This report consists of six additional chapters:

- Chapter II is an Executive Overview summarizing the major points and findings in this report.
- Chapter III focuses on VA's mission and new organization, department status, trends that uniquely affect the agency, and agency preferences for IS contractors.
- Chapter IV presents the market forecast for each segment of the information systems and services market at the VA.
- Chapter V discusses current major IS programs and planned initiatives at the agency.
- Chapter VI presents acquisitions plans, preferences, and procedures used by the VA for ADP/T resources.
- Chapter VII presents vendor views of agency IS opportunities. Special concerns and impressions of VA procurement practices are also discussed.

Several appendixes are also provided:

- Interview Profiles
- Definitions
- Glossary of Acronyms
- Policies, Regulations, and Standards
- Related INPUT Reports
- Questionnaires

Following the appendixes is a description of INPUT and its programs and services.

II

Executive Overview

The Department of Veterans Affairs exercises responsibilities that surpass those of most of the world's largest corporations. VA functions as the largest health care provider in the U.S., operating over 400 medical care facilities. The department dispenses over $15 billion in compensation, pension, and educational benefits to veterans and their families, and directs a $200 billion insurance program.

A

VA Modernization Factors

Computer systems have in recent years played a critical role in the delivery of veterans benefits and services. The department recognizes that it must use information technology more effectively to fulfill mission directives as it approaches the year 2000. As shown in Exhibit II-1, factors that focus on achieving productivity gains are driving IS modernization.

EXHIBIT II-1

VA IS Modernization Factors

- Expedite benefits processing
- Improve patient care services
- Automate cemetery processing systems

Most of VA's current information systems require revamping. Data are not shared within and between the three major administrations. Information systems were mostly developed on disparate proprietary systems. Many applications continue to run in batch mode and are not accessible

on-line. Other information processes within the three major administrations are still performed manually.

Departmentwide, VA information systems are modernizing or restructuring to expedite benefits processing, improve patient care services, and automate cemetery systems. The information technology available today will allow VA to provide communications among computer systems and to extend information access to most VA personnel through a decentralized architecture. By improving information resources, VA will provide a more cost-effective and responsive delivery of veterans services.

B

Impact of Department Status

In March 1989, VA was elevated to cabinet level and became a department. Exhibit II-2 shows the impact of Department status on VA IS structure and planning as perceived by agency respondents in this study.

EXHIBIT II-2

Impact of Department Status

Impact	Percent of Responses*
None	46
Planning more visible	31
Enhanced political visibility and influence	23
IRM office created	15
Improved coordination between VA elements	8

* Will not add to 100% because multiple responses were allowed.

Over 75% of the responses reflect an observable change within VA IS structure and planning processes. IS planning efforts have become more structured and visible within the department. Increased political influence at the congressional level should make it easier for VA to obtain funding for improvements to information systems.

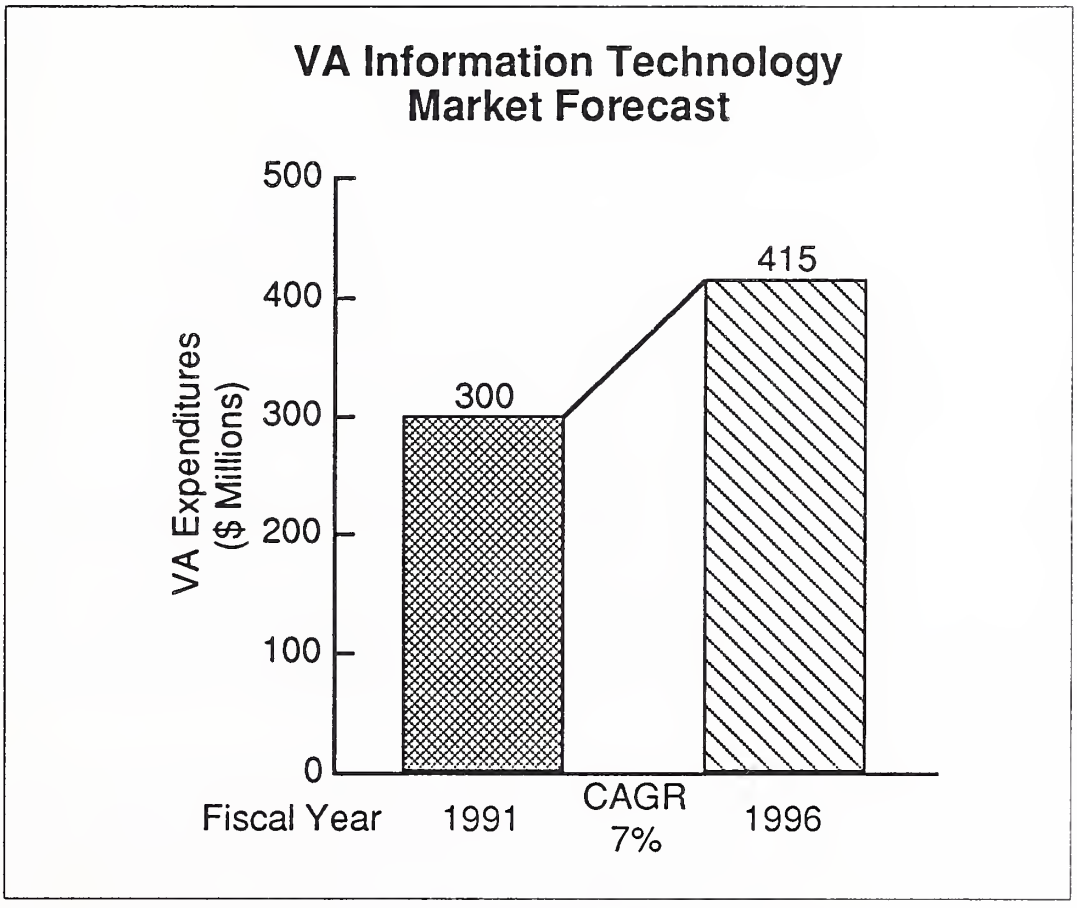
C

Market Forecast

INPUT estimates that the contracted portion of VA's information technology expenditures will grow from $300 million in FY 1991 to $415 million in FY 1996, as shown in Exhibit II-3. Growth rates for individual/service delivery modes will range from 4% to 14% over the forecast period.

The department's information systems modernization efforts and additional demands placed on VA for increased medical and compensation benefits from the aging Vietnam veteran population are propelling vendor opportunities at this federal agency.

EXHIBIT II-3

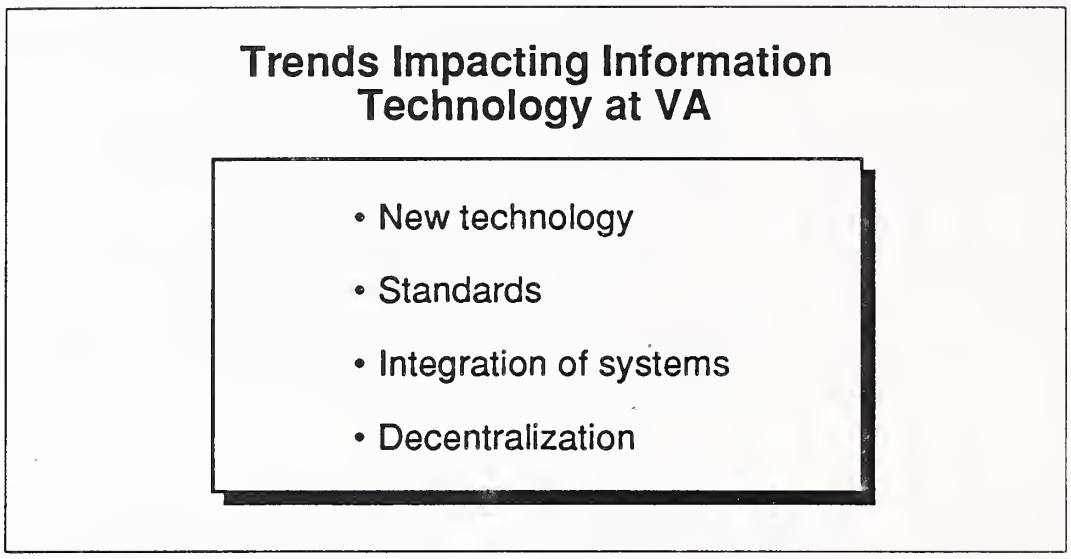


D

Trends in Using Information Systems

Agency respondents identified the trends listed in Exhibit II-4 as dominating information technology use over the next few years.

EXHIBIT II-4



VA intends to incorporate many of the recent information technology products into department information systems operations. EDI will increasingly be used to expedite financial transactions involving benefits compensation, supply ordering, and payments. Overhead costs should also decline sharply as the number of EDI transactions increases to vendors and veterans.

The department has experimented with a prototype image technology system and expects to use similar systems throughout the VA to reduce paperwork and automate records maintenance functions.

SQL-based data bases have recently become a standard for new data base development at the Department. Using this technology will help VA share data across organizational elements and disparate hardware systems.

VA is also striving to comply with GOSIP and POSIX standards. The agency will use OSI- and POSIX-compliant products to achieve interoperable systems solutions. At this time, adherence to the POSIX standard is expected to be limited to office environments and only when it is economically and technically feasible.

VA will rely heavily on standards and new technology that will facilitate integration of department information systems.

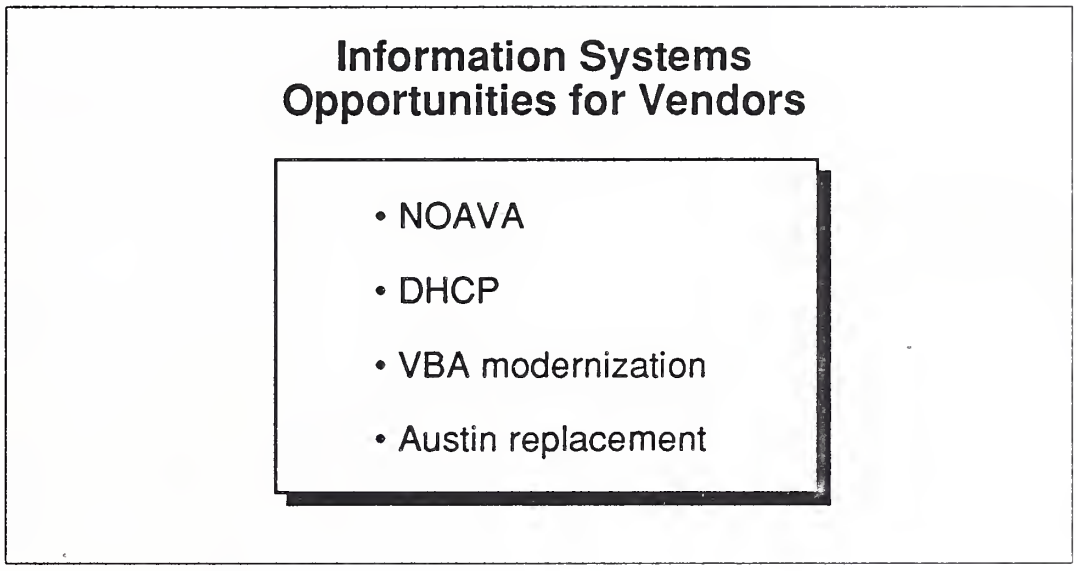
One of the goals of information systems modernization is to decentralize processing as much as possible throughout the three major operating administrations. VA will continue to take advantage of inexpensive and powerful microcomputers that are linked in networked environments and will extend information processing to all levels of employees. Based on reorganization plans announced in the fall of 1990, it appears that VA is also decentralizing its IS line management authority.

E

Information Systems Opportunities for Vendors

The department's announced plans for information systems initiatives are listed in Exhibit II-5. Opportunities that have large revenue potential for vendors are limited in spite of VA's modernization thrust.

EXHIBIT II-5



The contract for Nationwide Office Automation for the VA (NOAVA) is expected to be awarded by late 1990. Its value is estimated at $350 million. Through this contract office automation hardware, software and services will be made available to all VA offices nationwide.

Acquisitions for hardware and peripherals are expected to continue through FY 1996 to improve the Decentralized Hospital Computer Program's (DHCP) IS capabilities. Although not announced, INPUT also expects Veterans Health Services and Research Administration (VHS&RA) to acquire image technology that will integrate textual and graphical patient records as a DHCP module in the foreseeable future.

The Veterans Benefits Administration (VBA) modernization effort appears to be the only large-scale opportunity open to contractors. An RFC is expected to be released by late 1990 to solicit vendor comments. All benefits delivery systems are expected to be modernized or automated through this initiative. Systems modernization will be conducted in segments and is expected to be fully implemented during 1996.

The Austin Data Processing Center uses Amdahl and Honeywell mainframe equipment. Amdahl's contract will be recompeted in 1992.

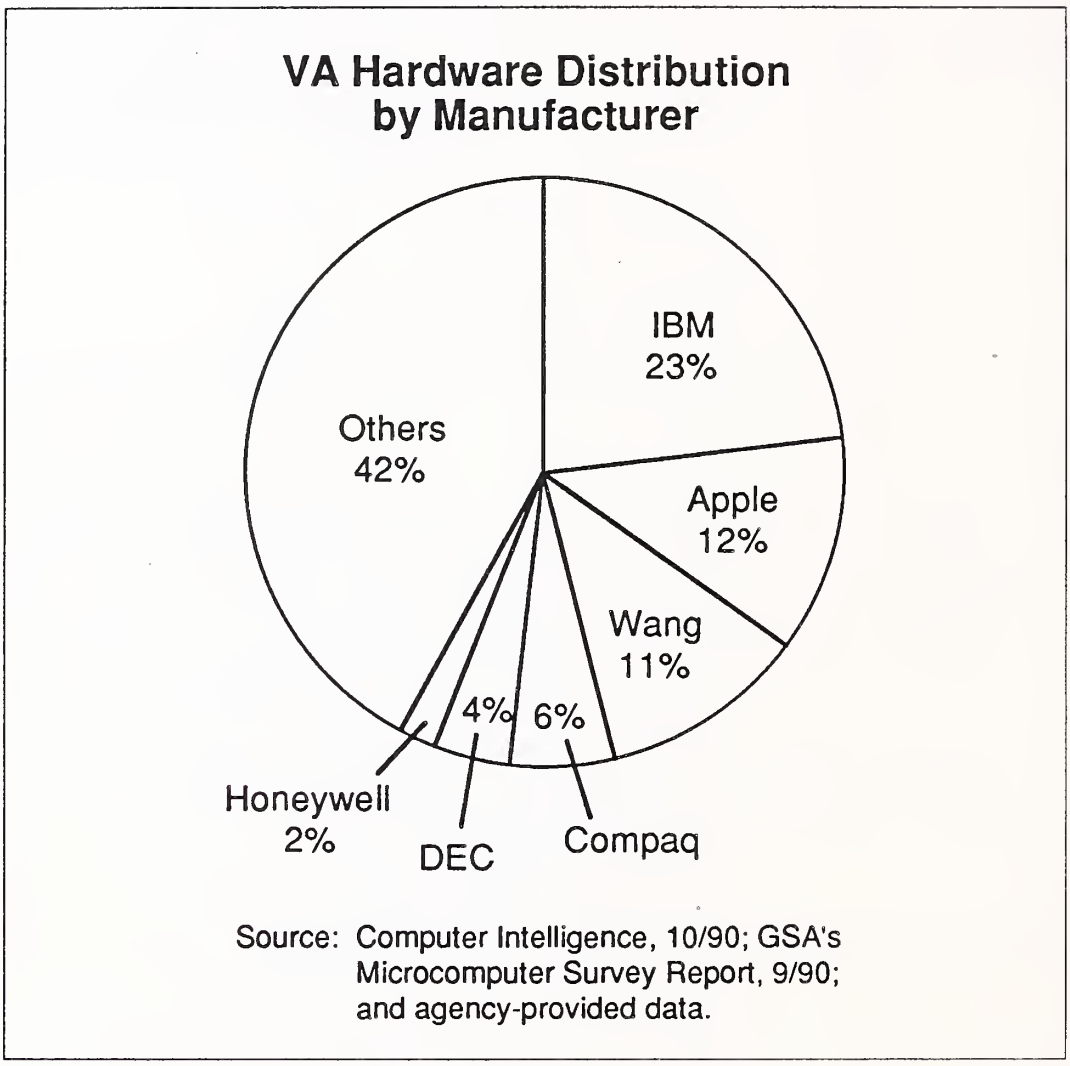
F

Leading Equipment Suppliers

VA's disparate hardware environment is depicted in Exhibit II-6. Six vendors' products represent approximately 60% of the installed computer systems; the remaining 40% of VA computers come from numerous other manufacturers. IBM has the strongest market presence at the agency (23%) largely due to the amount of micros and midsize systems installed.

It should be noted that Honeywell has heavily penetrated the agency in terms of mainframes and terminals, yet Honeywell's actual systems count represents only 2% of VA's installed base.

EXHIBIT II-6



G

Recommendations

Vendors desiring to retain or increase their revenues through contracts at the Department of Veterans Affairs must take a flexible approach to marketing the agency. Few major procurements have been announced by VA. As VA's decentralization efforts continue, large contractor opportunities will become harder to locate. Vendors' marketing strategies must also be decentralized and directed at VA regional offices and medical facilities. Equipment purchases and professional services will be sought at the local levels.

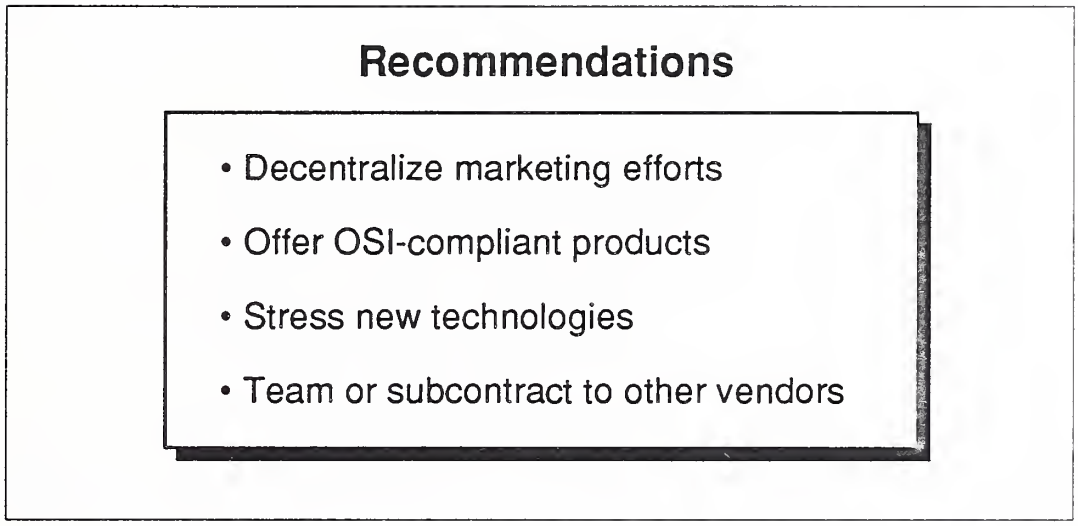
Vendors with OSI-compliant products will find it easier to market their products to VA. The department will purchase products that facilitate data sharing and are interoperable across disparate hardware systems.

Vendors should develop marketing plans touting the advantages of using new-technology products. Although VA recognizes the benefits associ-

ated with utilization of EDI, imaging systems, CASE tools, and SQL-based data bases, the agency has traditionally been slow to embrace new technologies. VA desperately needs to utilize these products to modernize current information systems. Added influence from vendors should speed the process.

Vendors should continue to participate in VA contracts as subcontractors or teaming partners. Additional market exposure can only enhance revenues and help build a smoother relationship with VA. Exhibit II-7 summarizes these recommendations.

EXHIBIT II-7



III

Agency Overview

This chapter presents a brief historical perspective of the growth of the Department of Veterans Affairs and its mission. The evolution of information systems within the agency, as well as IRM structure and recent reorganization begun in March 1989, is presented in detail. The current hardware environment and trends INPUT believes are impacting IRM planning and acquisitions are also reviewed.

A

Mission and Background

This section covers the history and overall functional as well as technical environment of VA.

1. Historical Background

The roots of Americans' taking care of disabled veterans were formed early in this country. As early as 1636, Pilgrims in the Plymouth Colony began the tradition by passing a law that provided for supporting disabled soldiers. In 1811, the federal government authorized the first medical facility for veterans. Earlier, states furnished some medical and hospital care.

Widows and orphans of veterans began receiving benefits and pensions in the 19th century. Many state homes were also established after the Civil War for veterans of American wars. By the 1920s, three federal agencies had developed to dispense veterans benefits: the Veterans Bureau, the Bureau of Pensions of the Interior Department, and the National Home for Disabled Volunteer Soldiers.

The Veterans Administration (VA) was created in 1930 to consolidate administration of veterans programs. The three component agencies became bureaus within the newly created VA. As the veteran population grew, especially following World War II, the VA's responsibilities and benefits programs were considerably expanded. The responsibility for administering the National Cemetery System was added to the VA's mission in 1973.

As information-processing technology became available in the 1960s, it was utilized by VA to process critical functions such as payroll, benefits payments, medical administration, vendor payments, accounting, and workload measurement. The Office of Information Resources Operations (OIRO) was established to support centralized ADP operations. OIRO had responsibility for all ADP directions, including policy and operational procedures for VA applications. VA began to move away from centralized mainframe processing in the early 1980s and pushed toward decentralized processing.

The Department of Veterans Affairs was created in March 1989 when the Veterans Administration was elevated to cabinet status. The new VA has become a very large business. Its budget is over $28 billion for FY 1991, and over 240,000 employees serve 3.9 million American veterans and their families.

The three major components of the modern Department of Veterans Affairs are:

- The Veterans Health Services and Research Administration (VHS&RA), the largest health care supplier in the U.S., operates over 400 medical facilities.

- The Veterans Benefits Administration during 1988 dispensed $15 billion in compensation, pensions, and educational benefits. VA also directed a $200 billion insurance program.

- The National Cemetery System (NCS) provides burial services in 113 national cemeteries and headstones for veterans in private cemeteries.

One effect of VA's new status has been the establishment of the position of Assistant Secretary for Information Resources Management. Through the auspices of this office, VA is instituting IRM strategic planning efforts that will strengthen support for operating Administrations and Offices and improve mission services.

VA's current major data processing centers are located in Philadelphia, Hines (IL), Austin (TX), and Washington, D.C. They support local Veterans Benefits Administration (VBA) Regional Offices and VA Medical Centers (VAMCs). The Austin Data Processing Center (DPC) has become the largest DPC and consists primarily of IBM and IBM-compatible equipment. VAMCs also process decentralized medical applications on DEC VAX hardware as part of the Decentralized Hospital Computer Program (DHCP).

As the VA approached the 1990s, evolving technology had a strong impact on information systems use at the VA by strengthening decentral-

ized processing activities. End-user computing capabilities were extended through the use of personal computers and mainframe dependence decreased. The availability of high-level programming languages facilitated code generation for applications programmers and reduced the applications backlog. IRM organizations had been developed within each of the organizational elements.

The Veterans Health Services and Research Administration (VHS&RA) has the responsibility of computer operations for each VAMC, as well as directing two hospital information systems programs that test applications software for applicability in automation efforts at the VAMCs: the Decentralized Hospital Computer Program (DHCP) and the Integrated Hospital System (IHS). The VHS&RS has also developed an IRM strategy that has become the VHS&RA strategic plan. It capitalizes on technological and institutional changes in medical practice and information technologies that will improve delivery of medical benefits to veterans.

The DHCP consists of custom VA software modules that are easily integrated into a complete hospital information system. VHS&RA's Medical Information Resources Management Office (MIRMO) is responsible for management, oversight, and coordination of DHCP throughout seven Information Systems Centers (ISCs). The ISCs provide software development, user application, and technical support to medical centers in VHS&RA. Thus far, DHCP Core modules (medical administration, pharmacy, and clinical laboratories) have been implemented at 164 sites. Because of this program, many IRM functions have been decentralized and responsibility shifted to local medical center directors.

The Integrated Hospital System (IHS) tests commercial hospital information systems at three medical centers. A recently completed comparison study of DHCP and IHS concluded that DHCP modules were less costly, while their effectiveness was comparable with commercial software. In response to this study and to another that recommended that DHCS be the basis of automation at VAMCs, Congress authorized the enhancement of DHCS to include: dietetics, radiology, medical records tracking, fiscal and supply functions, nursing, surgery, mental health, and a Decentralized Medical Management System (DMMS).

Although it often appears that DHCP will be the system chosen to automate VAMCs, IHS testing was recently expanded to five medical centers.

As VA automation began in the 1960s, the Veterans Benefits Administration (VBA) began to automate processes that deliver veterans benefits (compensation, pension, education, and insurance). This operation became known as TARGET. By 1980, VBA realized that many other activities required automation, and by 1985 created the Office of the Deputy Chief Benefits Director for ADP Systems Management to de-

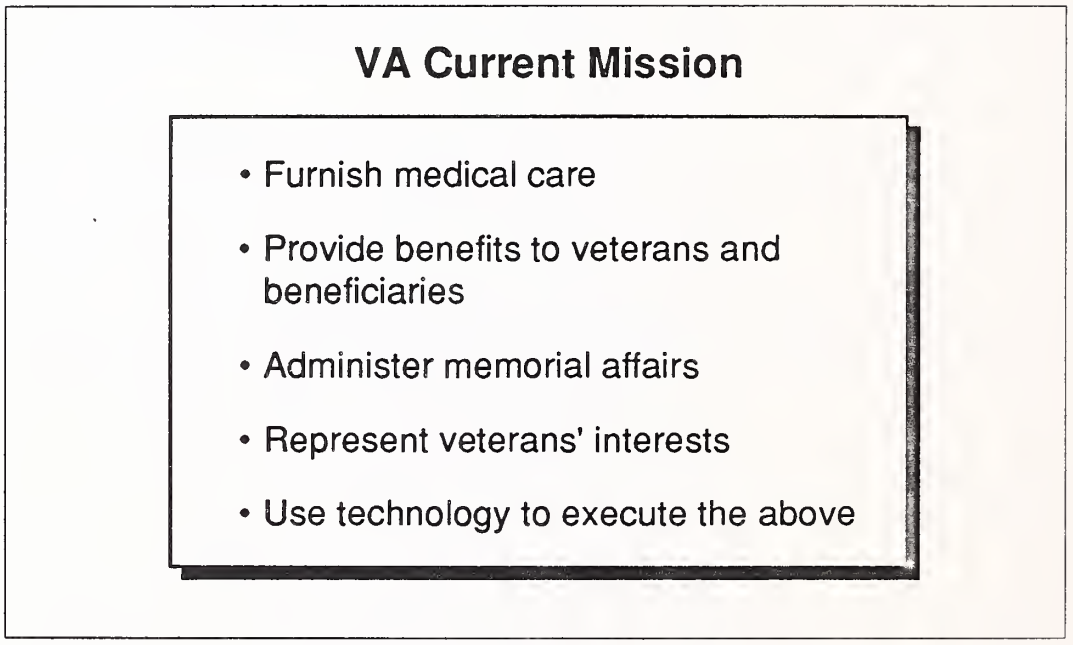
velop a VBA Modernization Program for ADP and telecommunications systems. The VBA Modernization Program will be conducted in twelve increments.

Automation efforts have been slower for the National Cemetery System. NCS began IRM planning activities and funding allocations in 1985. Headstone and cemetery applications processing, as well as other administrative processes, are now automated.

2. Current Mission

The Department of Veterans Affairs' current mission is provision of services to veterans and their families that broadly ensure their care, support, and recognition as listed in Exhibit III-1.

EXHIBIT III-1



The three major operating administrations were created to fulfill mission directives. The Veterans Health Services & Research Administration (VHS&RA), Veterans Benefits Administration (VBA), and National Cemetery System (NCS) work directly with veterans and their families. Headquarters personnel located in Washington, D.C. provide many policy and administrative services to assist in mission delivery functions.

B

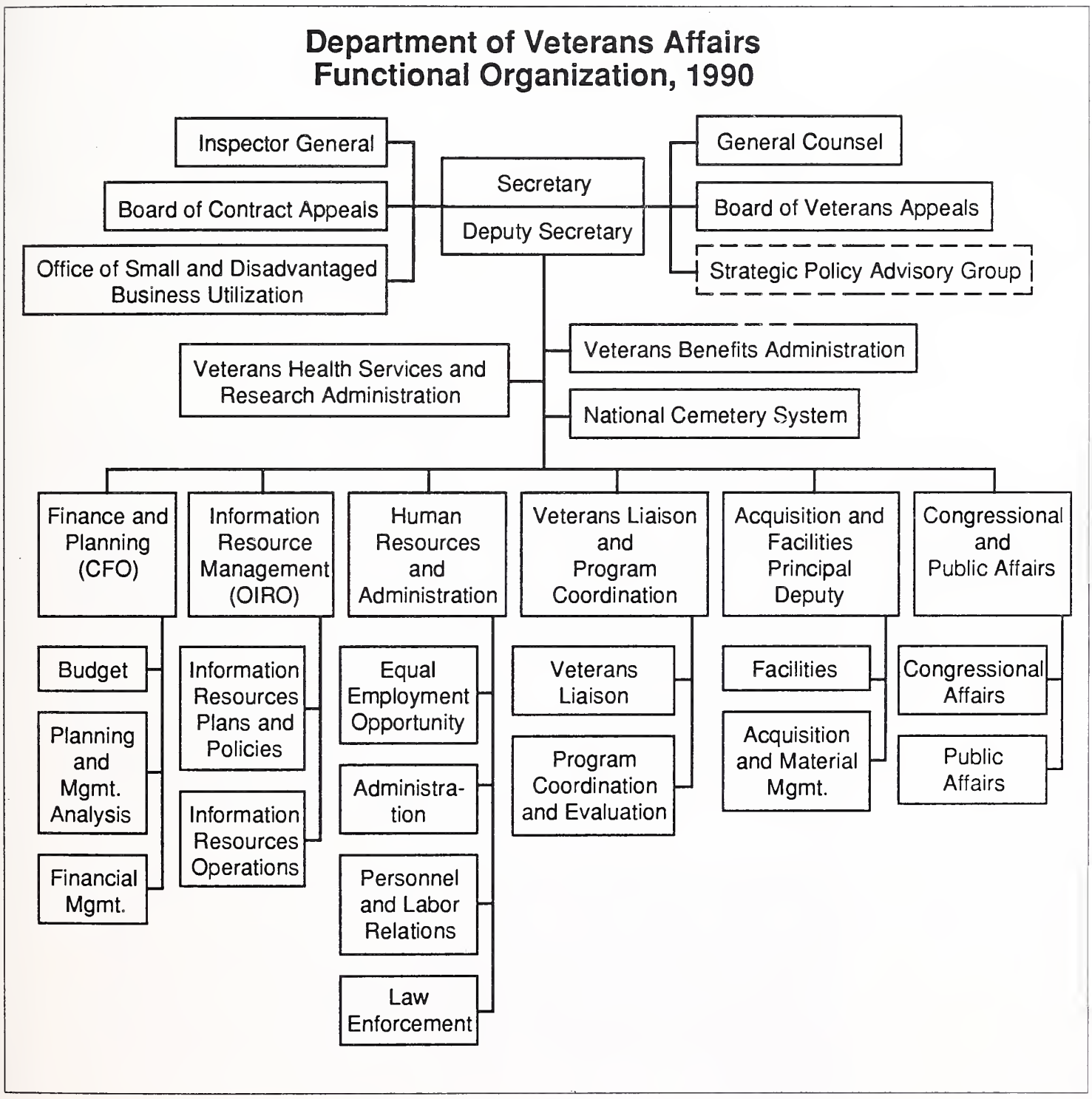
Information Systems Structure and Organization

1. Current Organization

VA's functional operations as of June 1990 are depicted in the organizational chart presented in Exhibit III-2. Overall agency structure is expected to remain stable despite rumored changes within the Office of Information Resources Management (OIRM). The autonomous major administrations are: VHS&RA, VBA, and the NCS. Each directly

reports to the Secretary of the Department of Veterans Affairs, along with the OIRM and other department offices.

EXHIBIT III-2



OIRM's primary thrust has been to promote cost-beneficial use of information technology and expand information systems access to nontechnical personnel VA-wide. To ensure planning of VA information systems, OIRM also oversees the planning, programming, and budgeting process for all IRM activities. The envisioned Strategic IRM Process will be on a yearly cycle and involves four stages:

- The IRM Strategic Plan is composed of the IRM strategic plans of each administration and key office. The first VA IRM Strategic Plan was completed in February 1990 and will be updated yearly. The plan identifies missions, goals, and objectives; guides development of IRM policies; and outlines IRM strategies to implement objectives.

- The IRM Strategic Program, targeted for implementation in FY 1992, will detail activities and initiatives outlined in the IRM Strategic Plan.

- The IRM Budget Formulation phase develops the yearly IRM budget for submission to OMB, the President's budget, and the congressional budget process.

- The Budget/Plan Execution is a budget operating plan. Organizations must also prepare Advance Procurement Plans (APPs) that are consistent with management and budget operating plans.

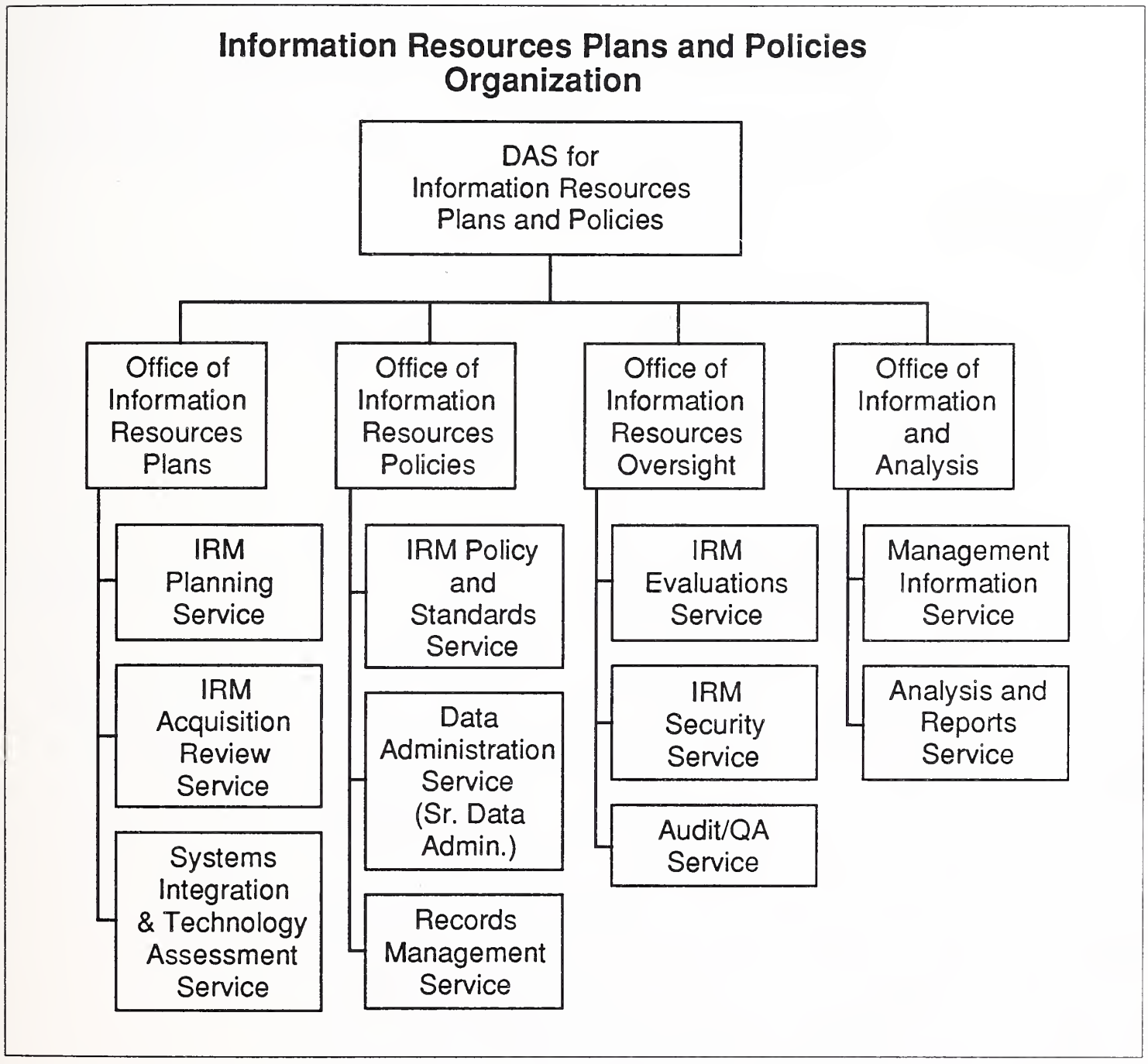
The Strategic IRM Process will be conducted by VA personnel from OIRM and the major program communities. The groups responsible for overseeing the production of the IRM Strategic Plan program and budget are the Strategic IRM Executive Council, the Senior IRM Steering Committee, and the IRM Working Groups and Task Forces.

Reporting to the Assistant Secretary for Information Resources Management (OIRM) are the offices of Information Resources Plans and Policies (OIRP&P) and the Office of Information Resources Operations (OIRO). Organizational charts are included for these offices in Exhibits III-3 and III-4.

It is the responsibility of the Office of Information Resources Plans and Policies to provide department-level coordination and support of information management and statistical requirements of VA organizations, Congress, and other government agencies. The OIRP&P sets policies and standards for information technology use within VA. OIRP&P evaluates IS planning documents of VA components and makes recommendations that will ensure that proposed programs are within agency guidelines.

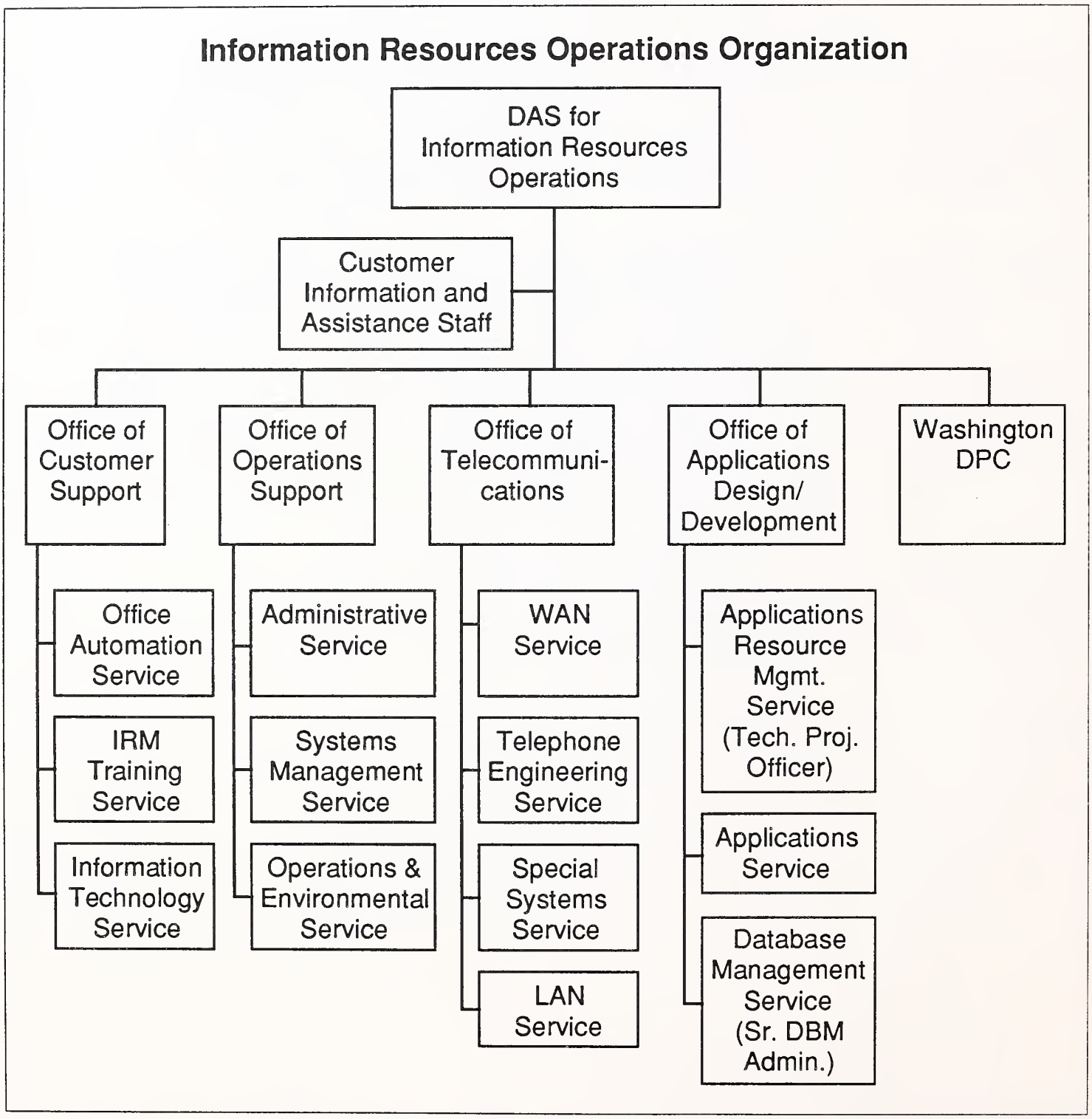
EXHIBIT III-3

Information Resources Plans and Policies Organization



The Office of Information Resources Operations (OIRO) has until recently provided a full range of ADP and telecommunications support to all VA organizational elements, including operating four VA Data Processing Centers. As of October 1, 1990, the operations of the Hines and Philadelphia DPCs were to be transferred to VBA, and the Austin operation to the Finance and Planning organization within VA. The VA Central Office (VACO) Data Center and staff elements at headquarters were still being supported by OIRO at the time this report was written.

EXHIBIT III-4



Each operating administration has its own IRM structure. Headquarters organizations are summarized in Exhibit III-5 through III-7. VBA's structure will be modified shortly to incorporate the added responsibilities of running the Hines and Philadelphia Data Processing Centers.

EXHIBIT III-5

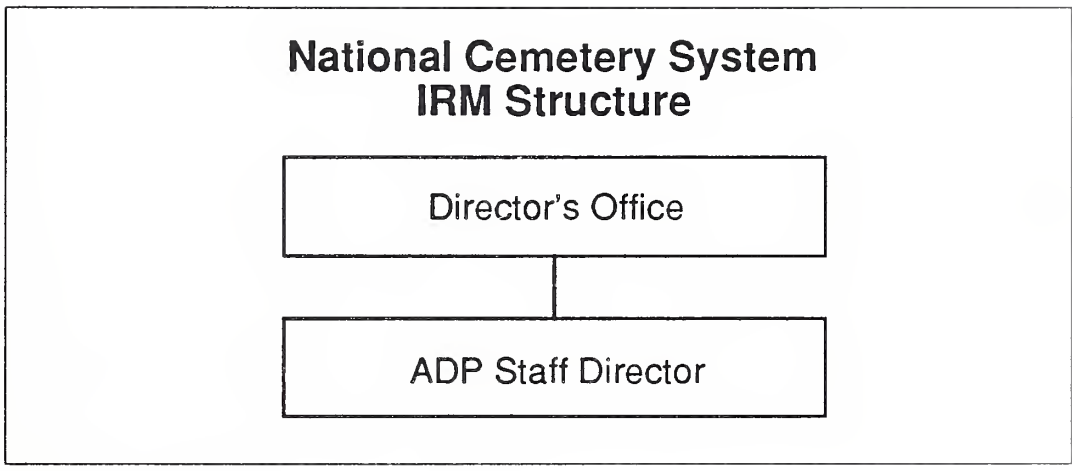


EXHIBIT III-6

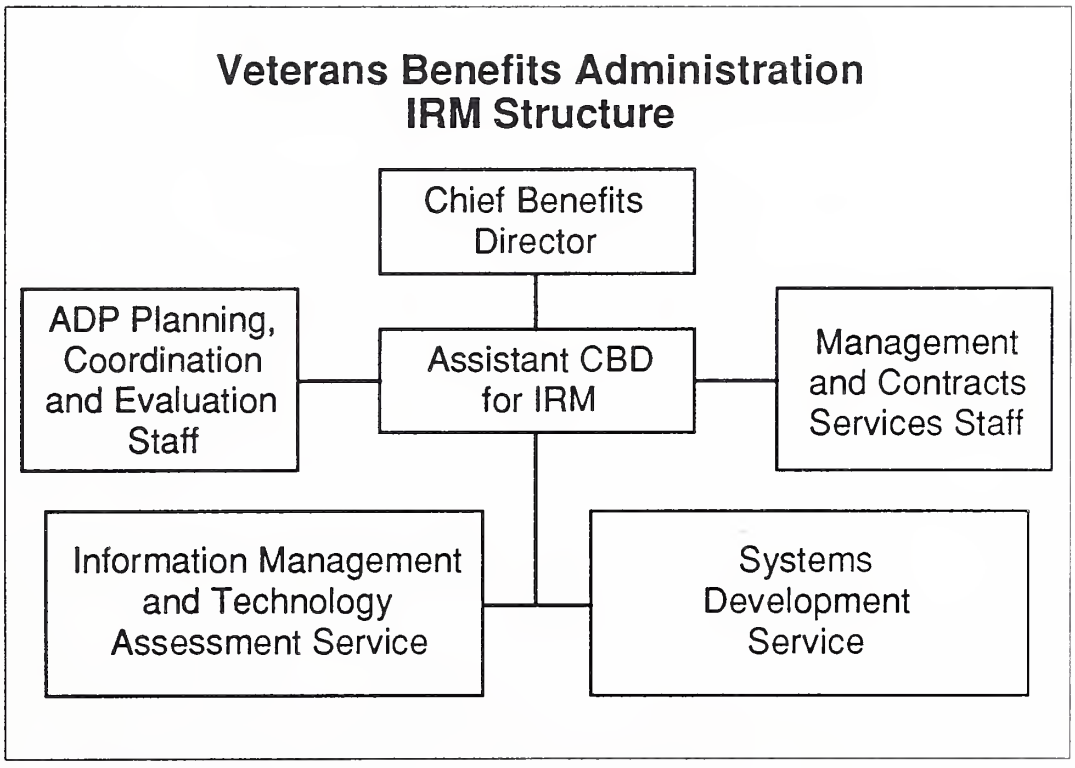
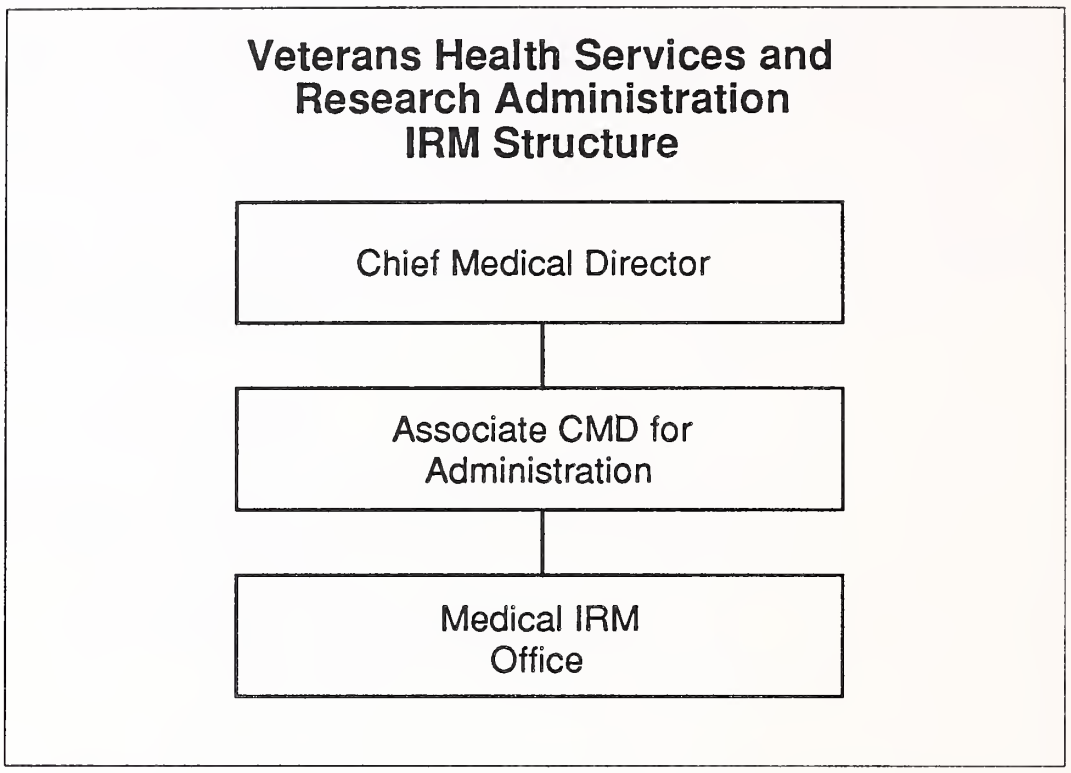


EXHIBIT III-7



2. Impact of Department Status

Following VA's elevation to department status, the Office of Information Resources Management was formed by the Secretary of Veterans Affairs to provide a more strategic foundation for IRM planning efforts. A tactical focus had been missing in the development of information systems. Information resources tended to reflect the limited views of the individual organizational elements within the department.

In recognition of the fact that OIRM was created to lead information systems planning and provide guidance regarding agency standards, INPUT asked VA respondents if department status had an impact on IS structure and planning. As shown in Exhibit III-8, over 75% of the responses indicated an observable change in the basic structure of IS planning efforts.

The most frequently observed change mentioned by respondents was that information resources planning became more structured and visible. Some respondents viewed this change as encumbering an already lengthy process, while others believed that new planning efforts were directing VA toward desirable IRM goals.

EXHIBIT III-8

Impact of Department Status on Overall IS Structure and Planning

Impact	Percent of Responses*
None	46
Planning More Visible	31
Enhanced Political Visibility and Influence	23
IRM Office Created	15
Improved Coordination between VA Elements	8

*Will not add to 100%; multiple responses allowed.

Now that VA has become a department, its political visibility and influence with Congress have improved. Respondents believe VA will be able to obtain requested appropriations to enhance agency information systems and provide better services to U.S. veterans and their families.

The least mentioned effects of the change to department status were the creation of the OIRM and improved coordination between VA organizational elements. One of the goals of the new OIRM was forging a structured planning process to achieve systems integration of VA information resources. Interdependencies among systems are key to the quality of service the department provides to veterans. OIRM has made progress in this area, but it is too early to gauge the results. Successful implementation of strategic IS planning is often not realized until new systems are operational.

Respondents were also asked specifically how department status impacted their respective organizations. Their responses focus primarily on the IRM organization and are ranked with respect to frequency of mention in Exhibit III-9.

Additional IRM planning was mentioned the most frequently, but chiefly by OIRM respondents. Many also expressed concerns that current IRM leadership, and its influence within the department, appear uncertain. VA may be facing additional reorganization of IRM functions. Following the shift of operational responsibility for three data processing centers to VBA and the Office of Finance and Planning, considerable anxiety exists within the department concerning the future of the present IRM structure and its power to direct IS modernization efforts. Some respondents also voiced concerns about job security. Others had not observed any changes within their organizations since VA became a department.

EXHIBIT III-9

Department Status Impact on Respondents' Organizations

Impact	Rank
Expanded IRM planning	1
Uncertain IRM leadership	2
Transfer of DPCs	3
None	3

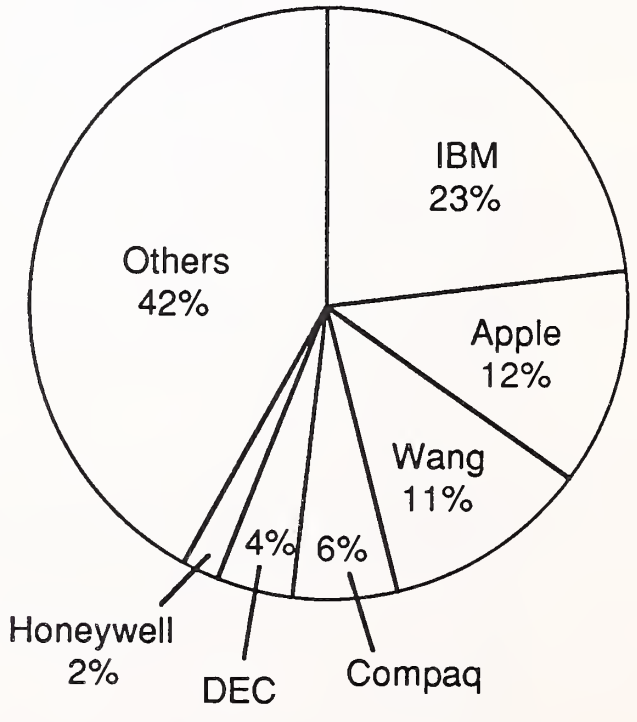
C

Current Environment

VA's current hardware environment is not dominated by the products of one or two vendors, as shown in Exhibits III-10 to III-14. The exhibits depict current hardware installed by manufacturer, hardware class, and installed-base class by manufacturer.

EXHIBIT III-10

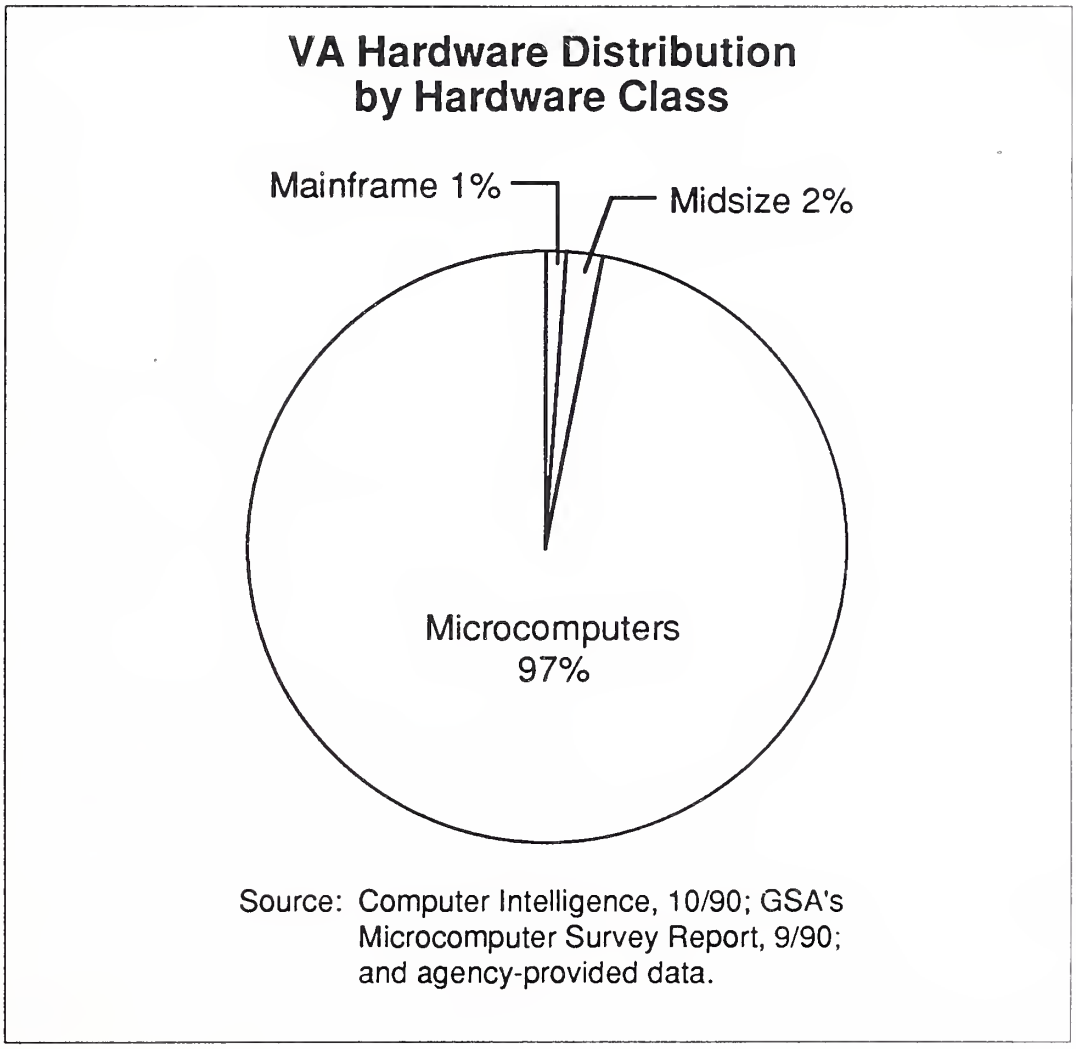
VA Hardware Distribution by Manufacturer



Source: Computer Intelligence, 10/90; GSA's Microcomputer Survey Report, 9/90; and agency-provided data.

IBM appears to have the largest market presence at VA. IBM equipment accounts for nearly one-fourth of the total computer inventory, and one-fourth of the microcomputer market within the department. Discussions of VA's hardware environment will be limited to percentages of systems, not actual CPU counts. The problem lies with the unreliability of inventory data, in that agency data is often at odds with reports to GSA and to the industry research firm Computer Intelligence.

EXHIBIT III-11

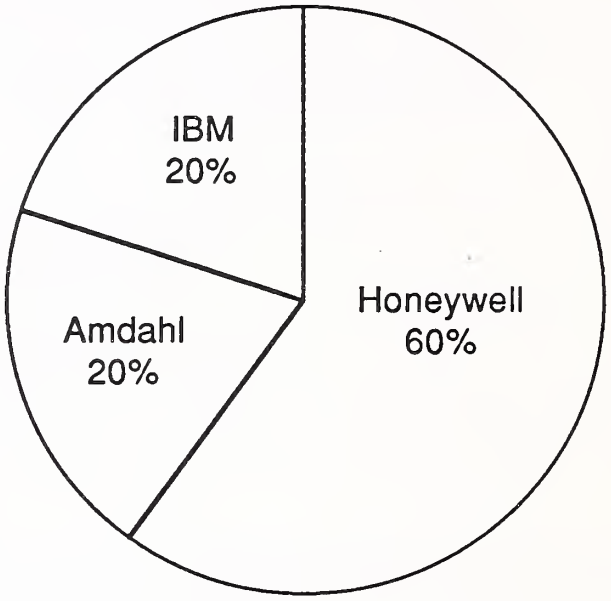


Source: Computer Intelligence, 10/90; GSA's Microcomputer Survey Report, 9/90; and agency-provided data.

The percentage of mainframe and midsize systems within VA is extremely small compared to microcomputer use. This percentage will continue to decrease as processing becomes more decentralized and the use of smaller, more powerful hardware is extended to end users within the department.

EXHIBIT III-12

Large Systems Installed Base by Manufacturer

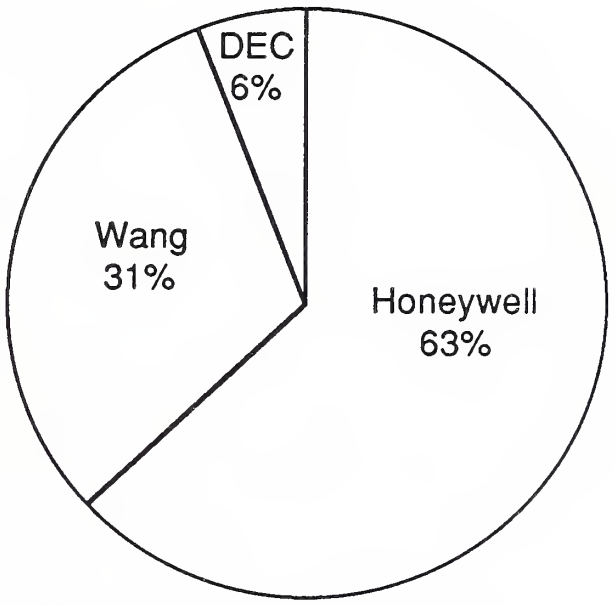


Source: Computer Intelligence, 10/90; GSA's Microcomputer Survey Report, 9/90; and agency-provided data.

Mainframes are primarily employed at VA to process financial and benefits applications. Honeywell has the most mainframes and midsize systems installed at VA. The Austin Data Processing Center uses Amdahl and Honeywell mainframes. An RFP to recompete Amdahl's contract is expected in 1992.

EXHIBIT III-13

Midsize Systems Installed Base by Manufacturer

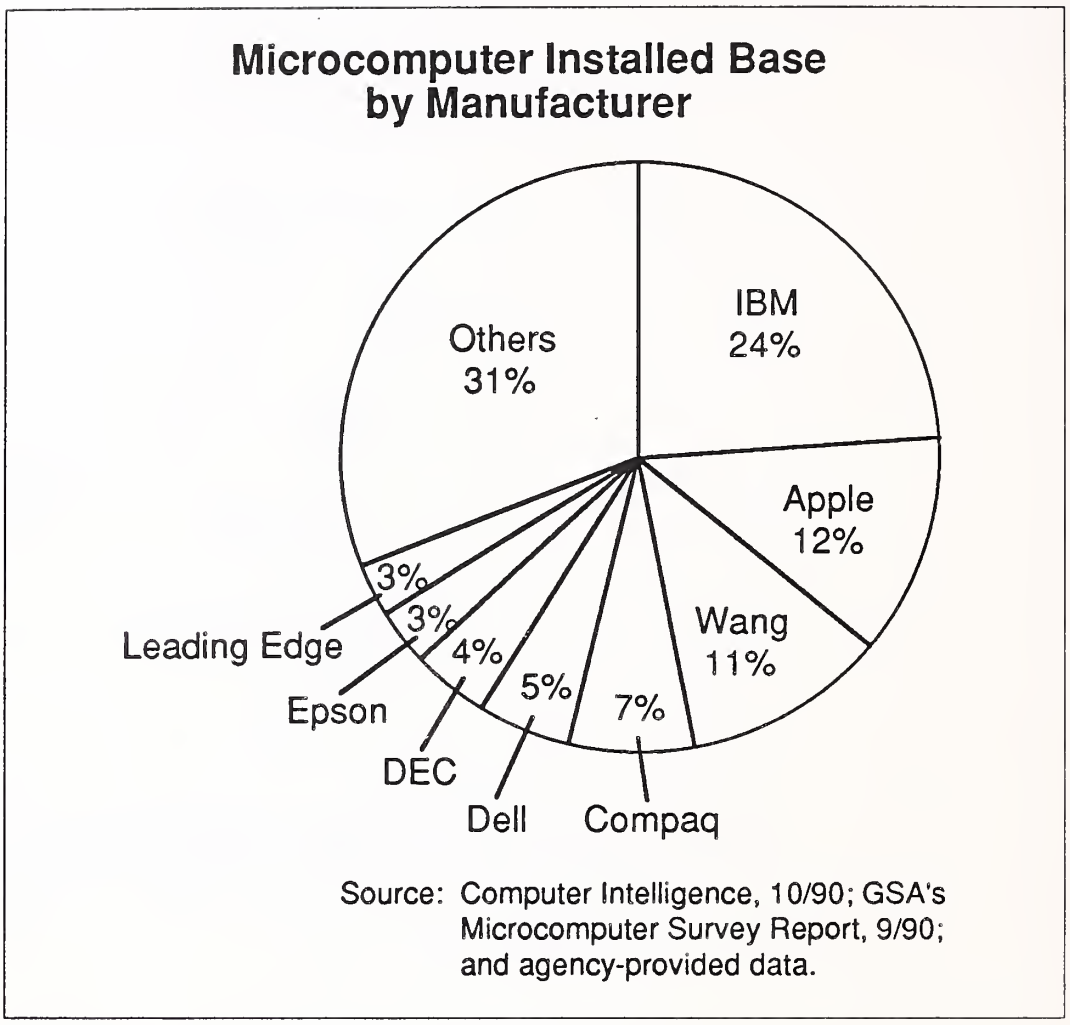


Source: Computer Intelligence, 10/90; GSA's Microcomputer Survey Report, 9/90; and agency-provided data.

Honeywell midsize equipment is used to process VBA's pension and education benefits applications. Midrange VAXs and Wangs currently service office automation requirements within VA. The current NOAVA procurement is expected to alter office information systems VA-wide.

A high percentage of equipment in the Others category consists of microcomputers from a wide range of manufacturers. GSA's recent *Microcomputer Survey Report*, published in September 1990, lists over 160 different manufacturers' machines in use at VA.

EXHIBIT III-14



As in most agencies, microcomputers compose the largest segment within VA—97% of the total hardware environment, approximately 11,000 machines. In addition to IBM, vendors with the largest installed bases are Apple, Wang, Compaq, Dell, DEC, Epson, and Leading Edge.

A recent report issued by GSA inventoried federal agency equipment valued at over $50,000 per system, or leased at over $1,700 monthly. Exhibit III-15 presents GSA's data for VA, and INPUT's associated hardware classes.

Comparison with data reported during the first and second quarters of 1989 shows agency purchases of hardware have occurred. However, the number of CPUs listed suggests variances in how data were reported. The average age of VA CPUs dropped from nine years and two months to eight years and eleven months in the later half of 1989. As noted earlier, INPUT expects the composition of VA hardware inventory to change as overall VA IS modernization efforts continue. Aging hardware will be replaced, and new systems will be purchased to facilitate decentralization directions.

EXHIBIT III-15

CPU Average Age by Hardware Class

INPUT Hardware Class	GSA Hardware Class	Number of CPUs	Average Age (Yr./Mo.)	Average Agency Age (Yr./Mo.) (All CPUs)
Mainframe	Large to Very Large	3	05/06	08/11
Midsize	Medium	23	05/07	
Midsize	Small	811	09/00	

D

Information Systems Trends

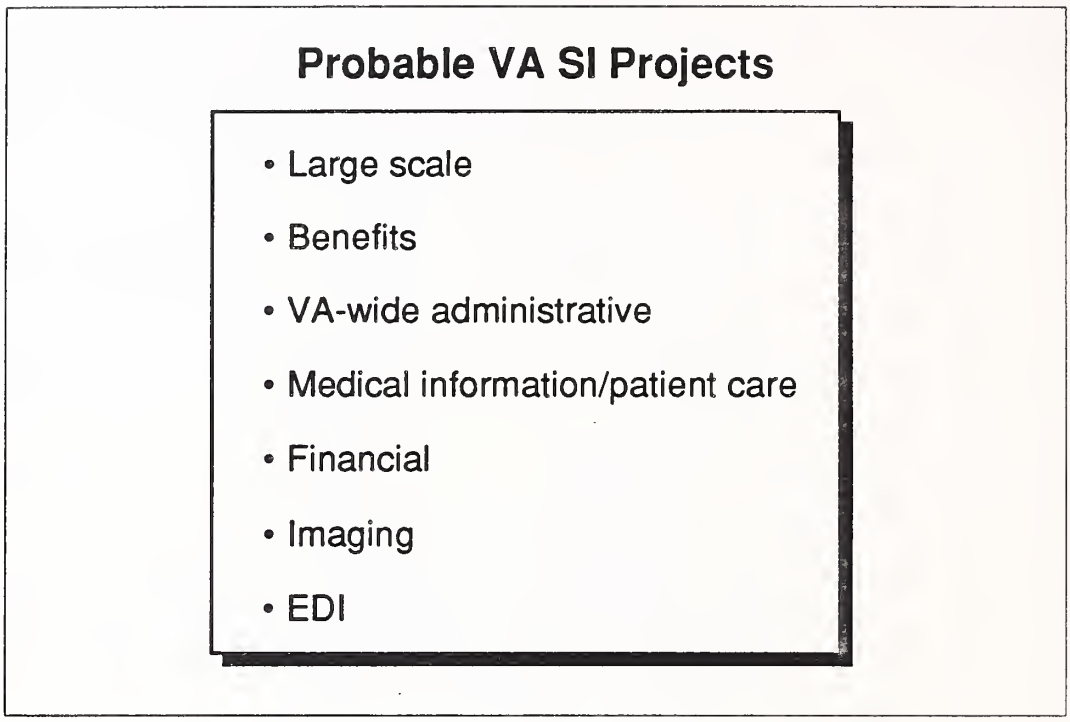
1. Systems Integration Directions

IS modernization at VA seeks to integrate existing and new information systems to achieve departmentwide data interoperability. Currently the same information is often duplicated, and resides on multiple independent systems. Vendors hope new systems integration initiatives requiring contractor assistance from the agency will be announced shortly. INPUT asked VA respondents how frequently their organizations intended to use contractors to provide SI services over the next five years. The average rating of 2.86 (based on a 1-5 scale, where 5 indicated extremely frequent use) given by respondents indicates fewer SI opportunities for contractors than INPUT had expected. VA tends to have more technical expertise than many other agencies. Apparently, some IS integration efforts will be performed by in-house personnel.

Agency respondents were also asked which types of information systems would tend to be systems integration projects. As shown in Exhibit III-16, respondents did not mention initiatives specifically, but referred to agency functional needs.

Whether respondents were referring to contractor-assisted or agency-performed SI projects remains uncertain. However, image technology represents one area that should necessitate contractor assistance. It is doubtful that VA possesses the required in-house technical capability to manage the successful implementation of this new technology.

EXHIBIT III-16



2. Standards Directions

Veterans Affairs has officially endorsed compliance with GOSIP, SQL, and POSIX. Department respondents were asked to rate the importance of VA's adhering to each of these standards plus TCP/IP. Responses are ranked in Exhibit III-17. GOSIP compliance received the highest score. The department's heterogeneous hardware and software environment demands OSI-based products that will allow message handling, file access, and transfer capabilities between disparate systems.

SQL was ranked second. Use of SQL will permit common data definition and retrieval capability across VA data bases. SQL systems also support end-user ad hoc queries. Information access will be extended to more users and assist in the delivery of veteran services.

Although the POSIX interface requirement has been incorporated in the current NOAVA project, POSIX placed third in importance. Most respondents hold the opinion that POSIX is useful only in OA environments. It is the intention of VA to incorporate POSIX-compliant operating systems into procurements for small and midsize hardware, provided it is economically and technically feasible.

TCP/IP received the lowest rating by respondents—reflecting less dependence on this communications protocol as GOSIP replaces it. TCP/IP will continue to be important for existing systems until they are upgraded or replaced.

EXHIBIT III-17

VA Ranking of Adherence to Standards for New Information Systems

Standard	Rank*
GOSIP	1
SQL	2
POSIX	3
TCP/IP	4

*Based on respondents' average ratings for each standard.

3. New Technology Directions

VA respondents were asked to rate the criticality of several new information technologies to VA operations over the next five years. The average rating for each technology type and the rationales supporting the ratings are shown in Exhibit III-18.

Evidently respondents view SQL-based products as the most important to VA information system operations. This recent VA standard for data bases will forge shared data access across VA organizational elements.

Image technology that processes text and picture images received an average rating of 4.3. VBA has already seen improvements using image technology to process correspondence between VA and the 6,000 schools accredited under the G.I. Bill. Previously, it took three days to locate information on a veteran, now only 45 seconds. This technology is critical to VA if effective management of patient care and benefits administration are to be realized.

VA's use of CASE technology, as well 4 and 5GLs, was also rated fairly critical by respondents. Software development tools improve programmer productivity and shorten systems development cycles. Many of VA's older batch applications will be converted to on-line systems using new productivity tools.

Data base machines also received a relatively high rating. High-volume transactions are processed rapidly by this integrated technology. VA has

EXHIBIT III-18

Importance of New Technologies to VA IS Operations, FY 1991 - FY 1996

Technology	Average Rating*	Reasons
SQL Products	4.8	VA DBMS Standard
EDI	4.4	Future method to handle all financial transactions
Imaging Systems	4.3	Lessens paper environment Promotes office automation
CASE Tools	4.1	Improves productivity Reduces maintenance costs
Data base Machines	3.9	Handles high-volume transactions
4 and 5GLs	3.8	Improves productivity
UNIX	3.4	Required for OA
AI/Expert Systems	2.8	Use limited to medicine

*Based on a 1 to 5 scale, where 5 = extremely critical; and 1 = not critical at all.

recently purchased a data base machine incorporating Oracle and Pyramid technology. Respondents expect wide acceptance of data base machines within the department.

UNIX was rated only 3.4, primarily due to project NOAVA, which required POSIX-compliant interfaces. The use of UNIX is perceived by respondents to be confined to office automation environments.

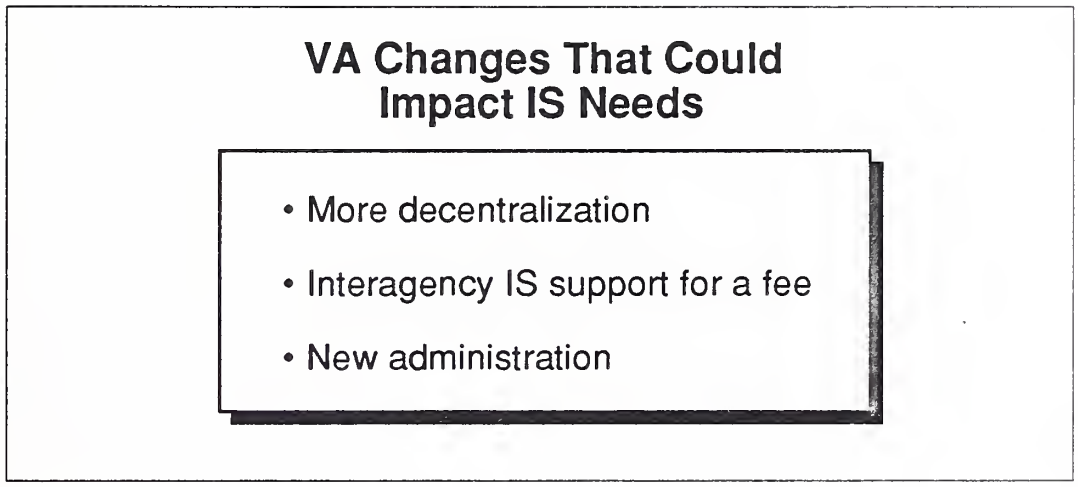
According to respondents, AI/expert systems will not be used extensively within VA. Applicability is expected to be limited to routine medical services and processing. AI/expert systems technology has proved useful at other federal agencies, particularly for processing inquiries. One

would expect such technologies would be useful in automating manual tasks within VBA.

4. Potential Impact on Information Systems

INPUT inquired whether VA interviewees expected further changes in mission, organization, or leadership to affect IS needs. As shown in Exhibit III-19, a few changes were mentioned. However, one-third of the respondents did not anticipate that IS requirements would change over the next few years as a result of these potential catalysts.

EXHIBIT III-19



Demands for additional hardware and software will increase if further decentralization of VA information processing occurs. VA is also exploring the possibility of offering interagency IS services on a fee basis at the Austin Data Processing Center. Accordingly, current environments could be upgraded to accommodate additional processing. Some respondents were concerned that new IRM leadership would alter recently developed IRM strategies and plans.

IV

Department of Veterans Affairs Market Forecast

When developing market forecasts for particular agencies, variables such as appropriations, management focus, customer expectations, and procurement success can have a major effect on out-year funding. The success or failure of one initiative, such as Nationwide Office Automation for the VA (NOAVA), can directly affect the forecast. When looking at market forecasts for the entire government, many of these factors tend to cancel each other over the long haul. However, an individual agency may experience dramatic shifts from year to year in resource availability.

A

Overall Resource Projections

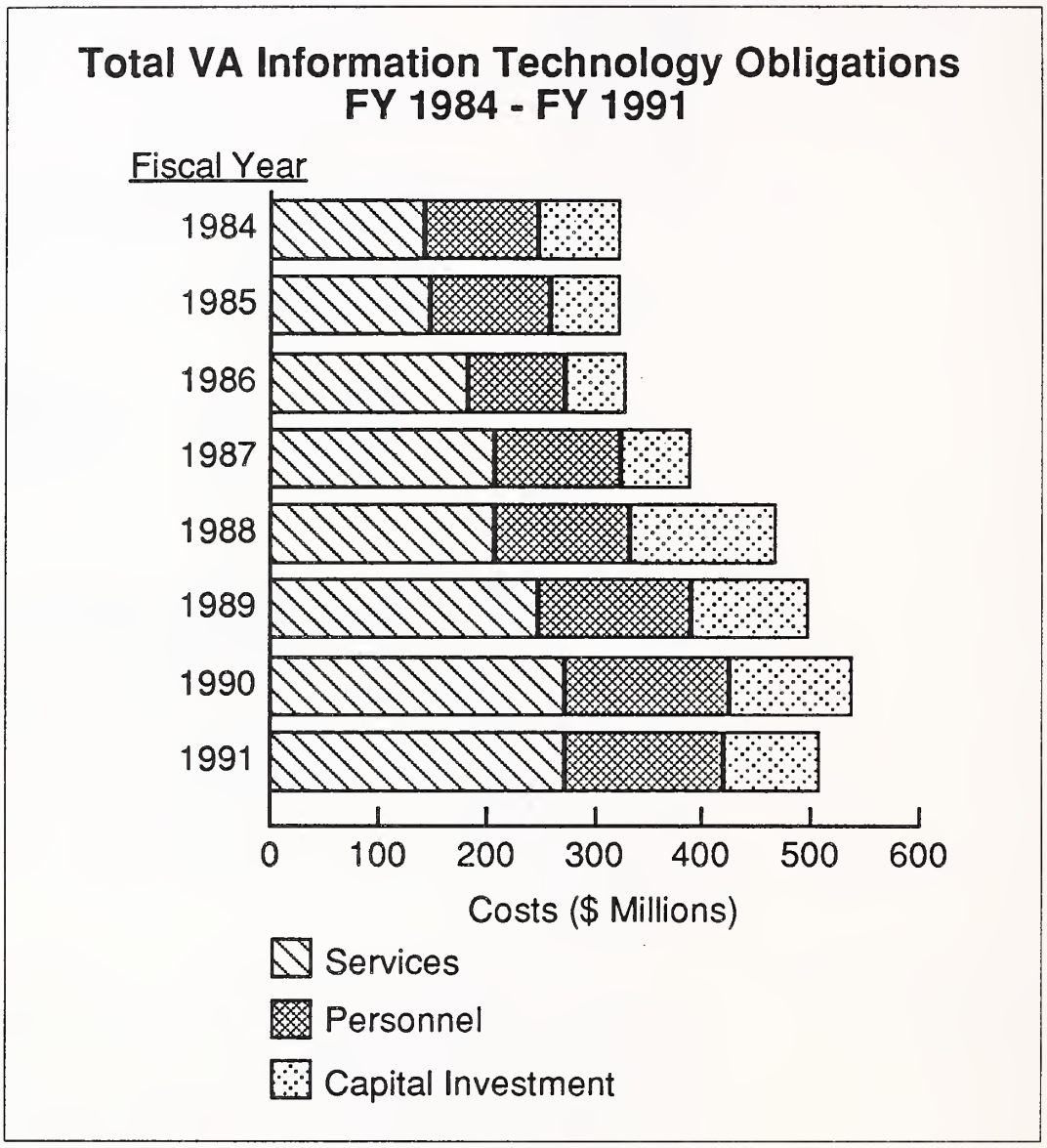
In looking at the role that information systems will play at VA, it is useful to consider VA's overall resource projections. Exhibits IV-1 through IV-4, taken from VA's most recent IS Plan, display information technology obligations and costs over the past eight years. Exhibit IV-1 shows a breakout by those categories specified in OMB Circular A-11, Exhibit 43A. Typically, capital investment includes:

- Equipment
- Software
- Site (Physical)

Services include:

- ADPE time
- Communications (voice and data)
- Operations and maintenance
- Systems analysis and programming
- System design and engineering
- Studies and other

EXHIBIT IV-1



The 43A Exhibit also includes rental of equipment, software, and space—as well as the acquisition of supplies. It is not clear why the VA omitted these items from Exhibit IV-1. At any rate, the exhibit shows an increase or constant amount in every year except the last. INPUT expects this upward trend to continue as VA further modernizes its information systems.

Exhibit IV-2 divides the same eight budgets functionally, by agency organization. Over the course of these years, the Hospital System received the bulk of the funding. However, the Veterans Benefit Administration shows some increase in FY 1991 as the agency continues to modernize its Regional Offices and the data centers supporting them.

EXHIBIT IV-2

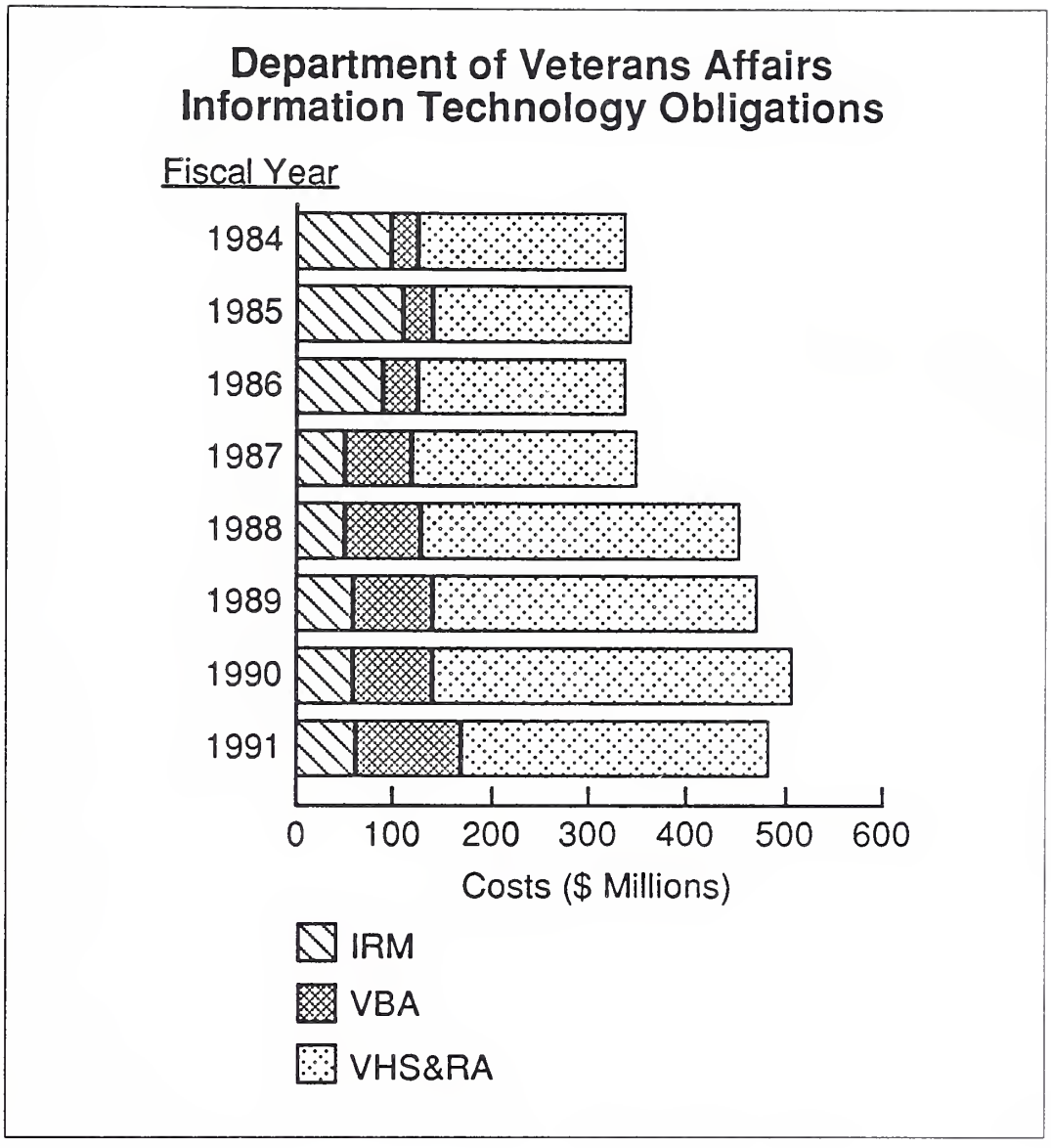
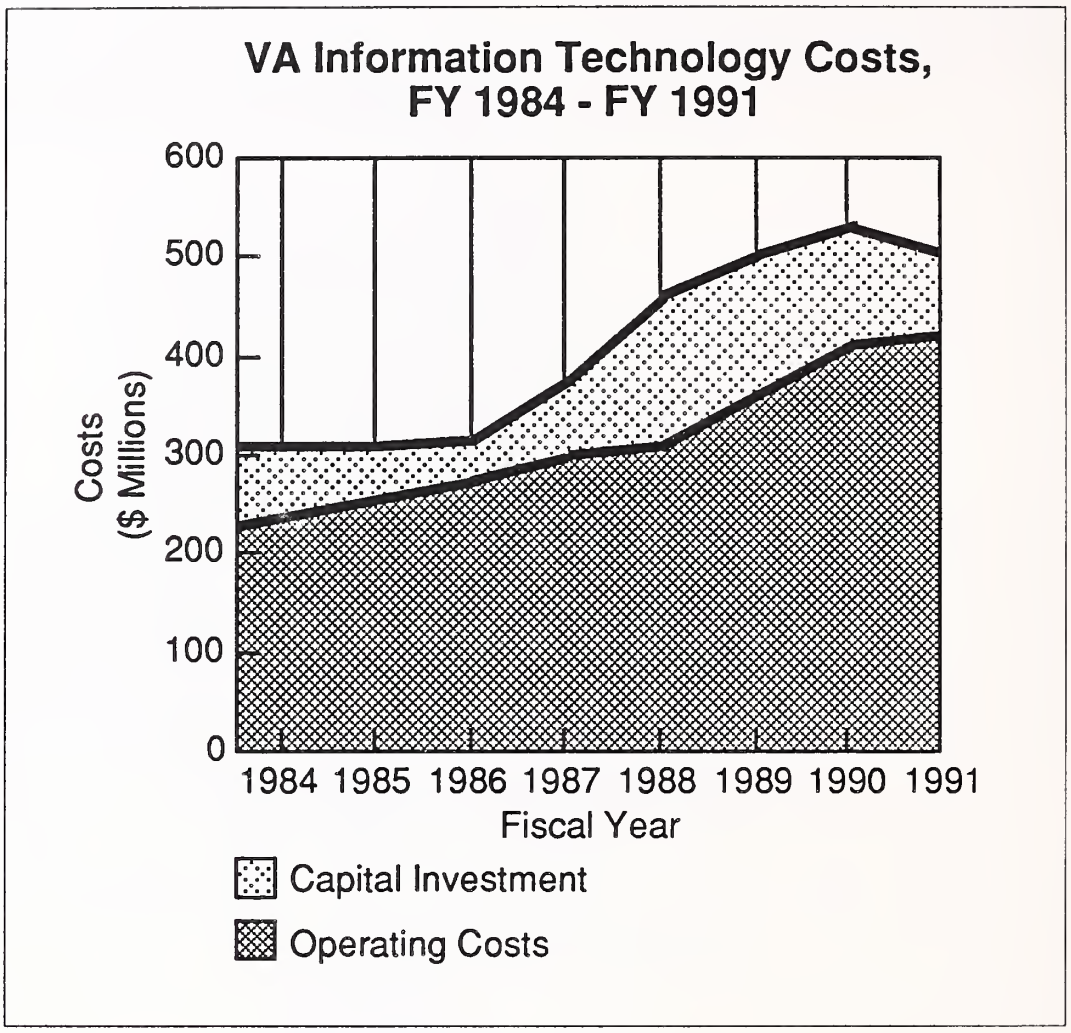


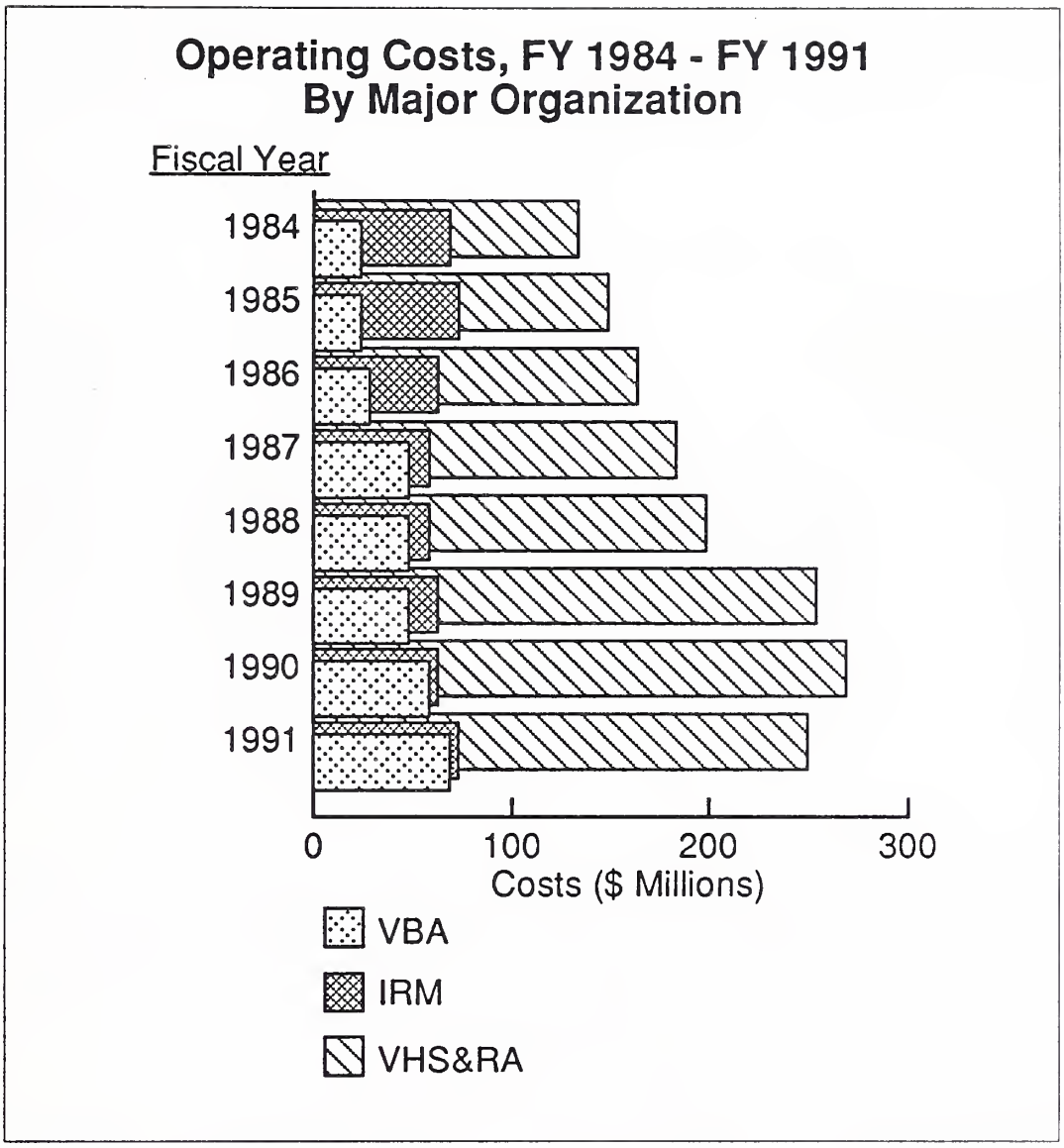
Exhibit IV-3 compares capital investments with operating costs over the eight-year period. Operating costs have continued to rise, while capital investment has fluctuated somewhat over the period. Despite the recent drop, INPUT expects capital investments to pick up sharply over the next few years as VA modernizes its mainline mission and administrative systems, as well as its office systems.

EXHIBIT IV-3



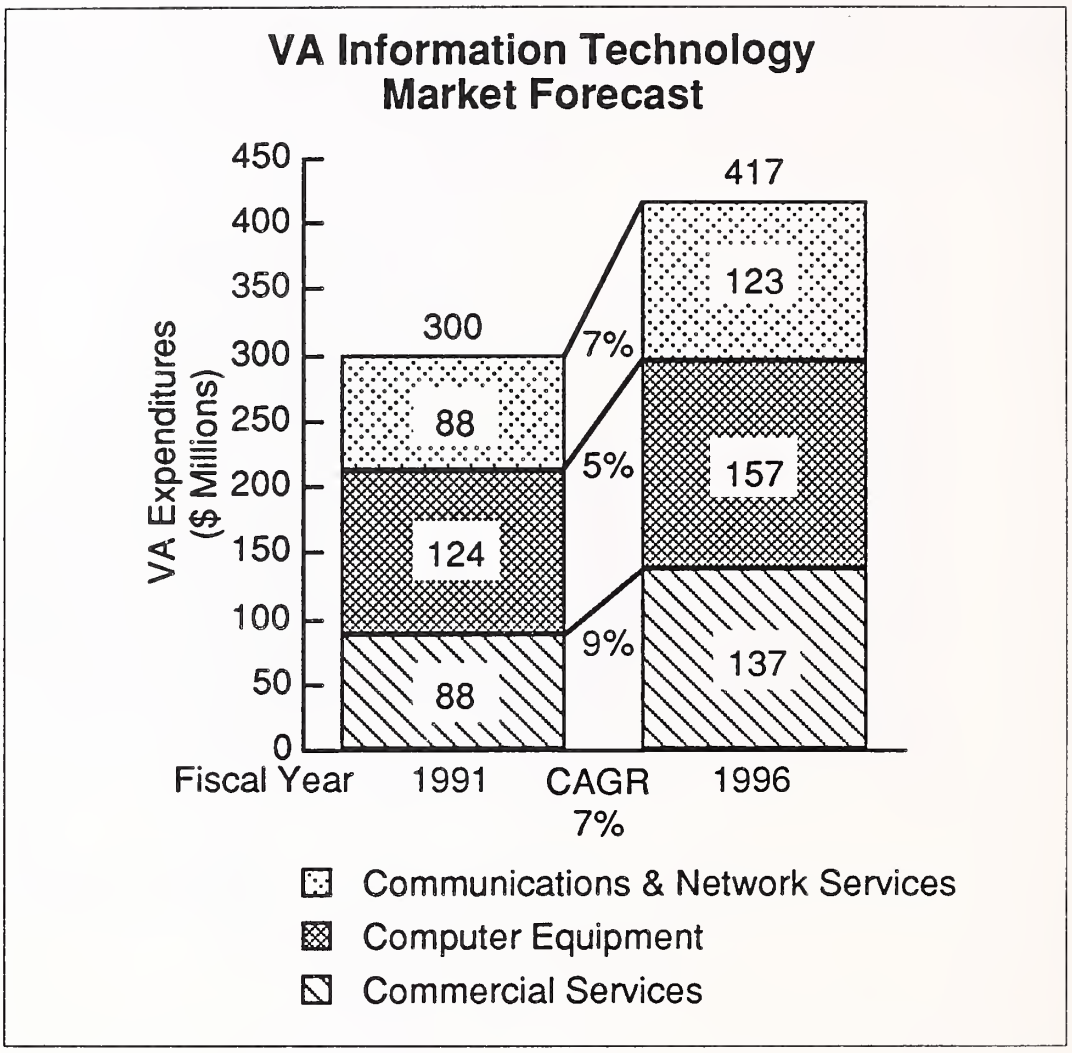
Finally, Exhibit IV-4 compares operating costs by organization over the entire eight-year period. To a large extent, spending trends parallel those in Exhibit IV-2. However, for the last two years, operating costs for the IRM organization have approximated those for VBA.

EXHIBIT IV-4



Overall, INPUT expects VA's information technology market to grow from $300 million in FY 1991 to $417 million, a compound annual growth rate (CAGR) of 7%, as shown in Exhibit IV-5. INPUT expects that spending on computer systems will initially be somewhat higher than suggested by current budget documents. This spending will grow more slowly, however, than that for commercial services or telecommunications. The following section provides detailed market forecasts, along with a discussion of the factors driving these forecasts.

EXHIBIT IV-5



B

Market Segment Forecasts

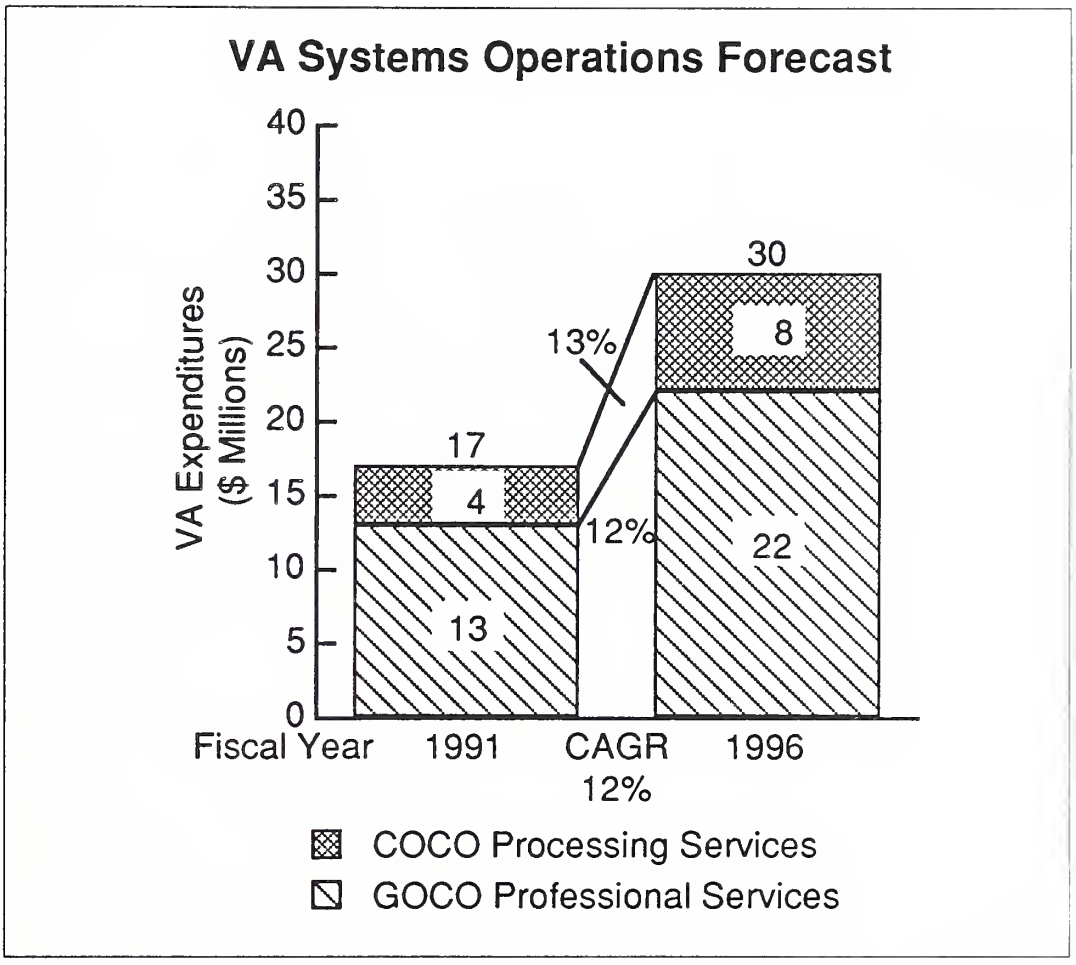
Based on VA's A-11 budget submission, individual initiatives that can be identified and sized, interviews with VA, and various reports and articles from secondary sources, INPUT has developed segment forecasts for VA. Overriding all data is the recognition that most Vietnam-era veterans have reached or are approaching middle age. INPUT believes that this large and aging veteran population will place increasing pressure on agency personnel to deliver benefits, hospital services, and ultimately burial services. In the final analysis, this will inevitably drive up demand for services, thus straining VA's information systems and forcing sizable upgrades. The current real estate market is causing an increase in defaults on VA-guaranteed loans, thus further increasing the current workload.

1. Systems Operations

As shown in Exhibit IV-6, the VA systems operations forecast will grow from $17 million in FY 1991 to $30 million in FY 1996, a CAGR of 12%. Support of contractor-owned, contractor-operated facilities is

growing slightly faster than that of government-owned facilities. Between FY 1988 and FY 1991, VA increased its spending on ADPE Time (a 43A line item) by more than 70%. During this same period, the line item for operations and maintenance has more than tripled.

EXHIBIT IV-6

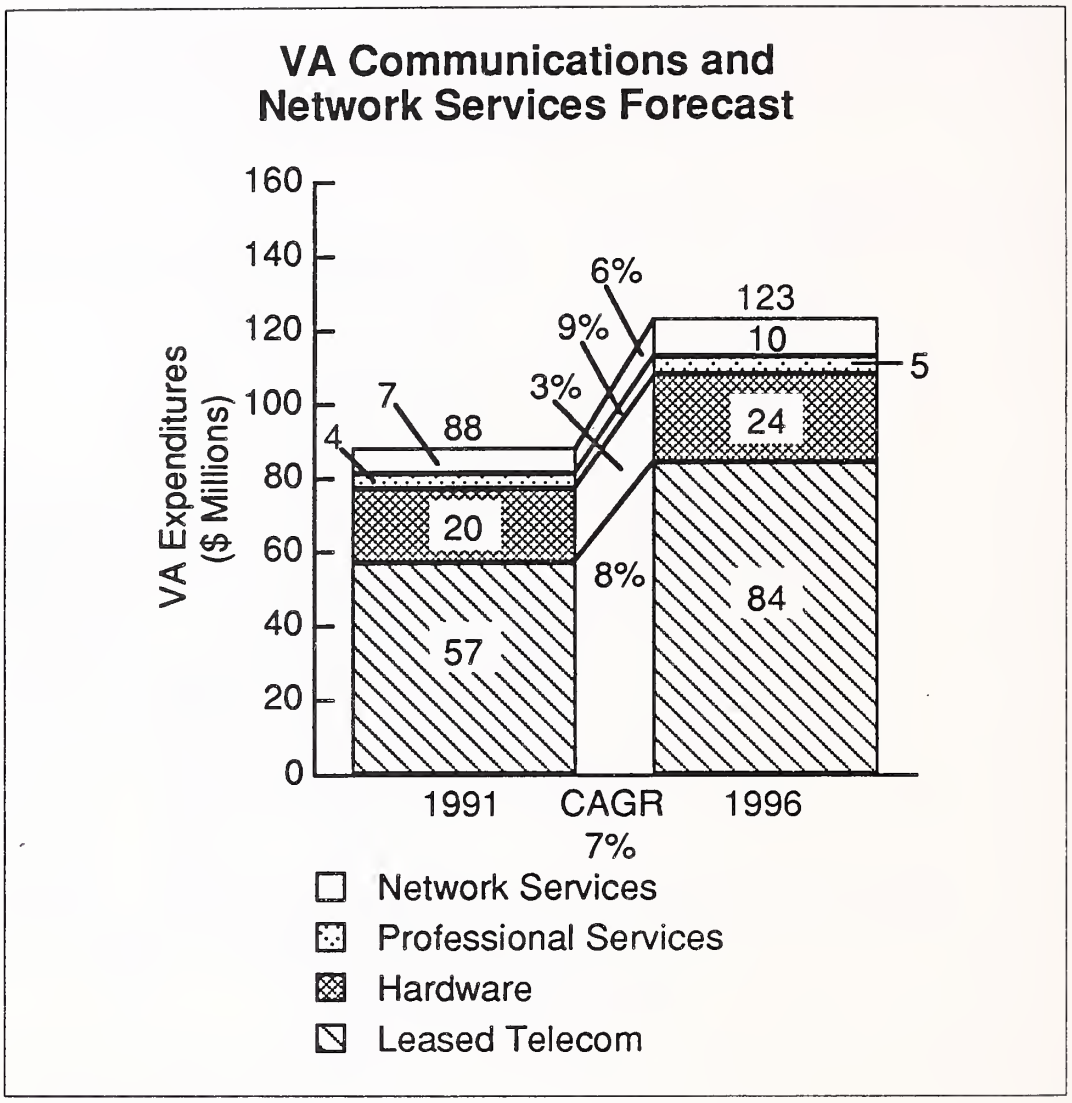


INPUT does not believe VA will be able to sustain these increases. Rather, growth will moderate as more in-house systems are modernized, thus taking up some of the workload. However, if some of VA's major initiatives are delayed for whatever reason, the systems operations market might grow faster than indicated in the exhibit.

2. Communications and Network Services

The wide dispersal of VA activities, with activities in all 50 states, dictates a fairly robust market for communications-related activities. As shown in Exhibit IV-7, VA's communications market will grow from approximately $88 million in FY 1991 to $123 million in FY 1996, a CAGR of 7%. As might be expected, leased circuits communications will continue to compose the bulk of the market, although professional services for related activities will grow slightly faster.

EXHIBIT IV-7

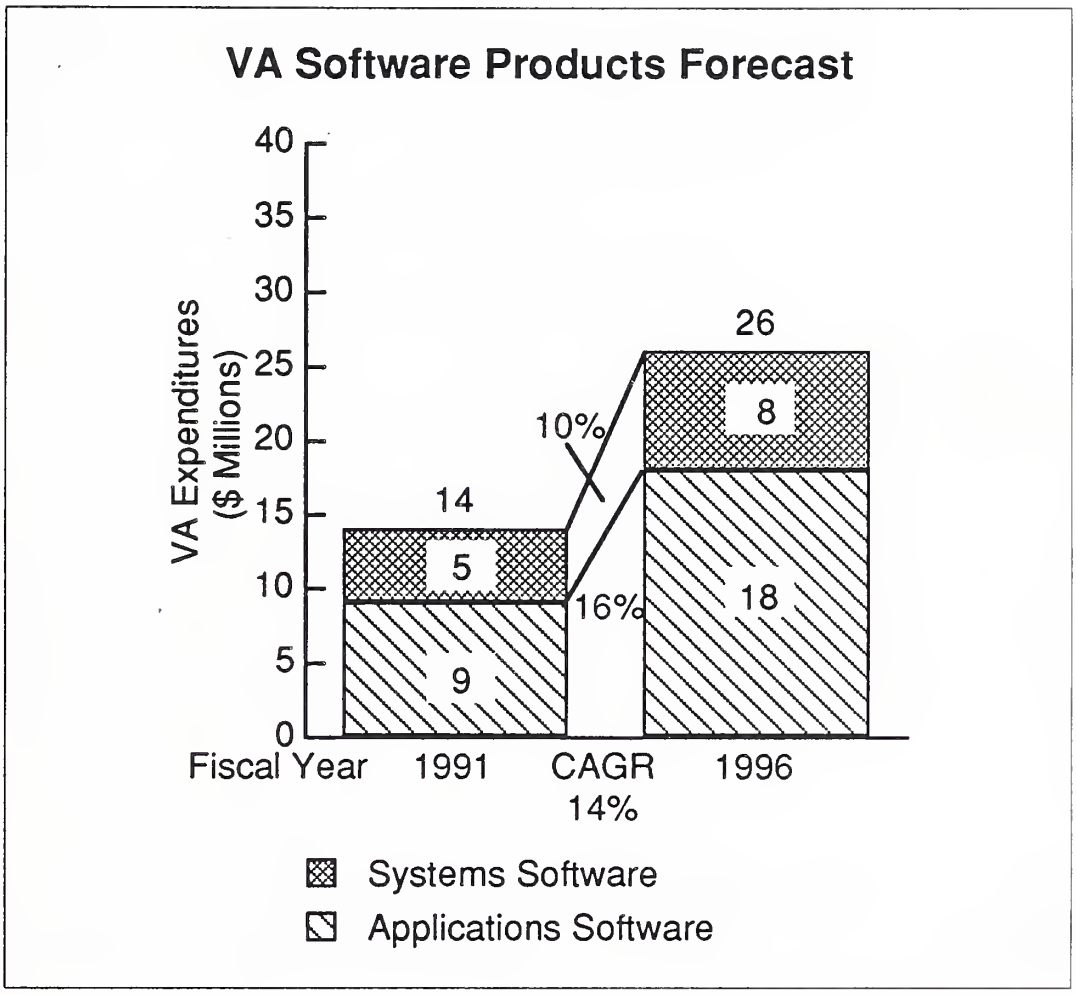


Improvements in the Benefits Delivery Network, the Personnel Accounting and Integrated Data (PAID) system redesign, Record of Interment processing, and office automation will account for much of the increase. Support for some of these enhancements will come from the Integrated Data Communications Utility (IDCU), a wide-area data communications utility network. IDCU will provide data communications services to VA facilities in the 50 states, the District of Columbia, Puerto Rico, and the Philippines.

3. Software Products

The market for software products at VA will grow sharply between FY 1991 and FY 1996. Exhibit IV-8 shows it growing from $14 million in FY 1991 to $26 million in FY 1996, at a CAGR of 14%. Applications software will continue to take an increasing share of this market, with systems software lagging.

EXHIBIT IV-8



Several factors are combining to produce this strong growth:

- VA's office automation initiatives will serve to increase systems software expenditures.
- Constrained IRM budgets are reducing VA's flexibility in contracting for tailored system development efforts, especially for administrative systems.
- OMB's emphasis on packaged software and software certification is encouraging many agencies, including the VA, to make greater use of software packages.
- Congressional interest in the Integrated Hospital System may limit VA's options for tailored software solutions in its hospitals.
- Greater software functionality, particularly in such areas as financial systems and EDI, is providing new options to VA in achieving its IRM objectives.

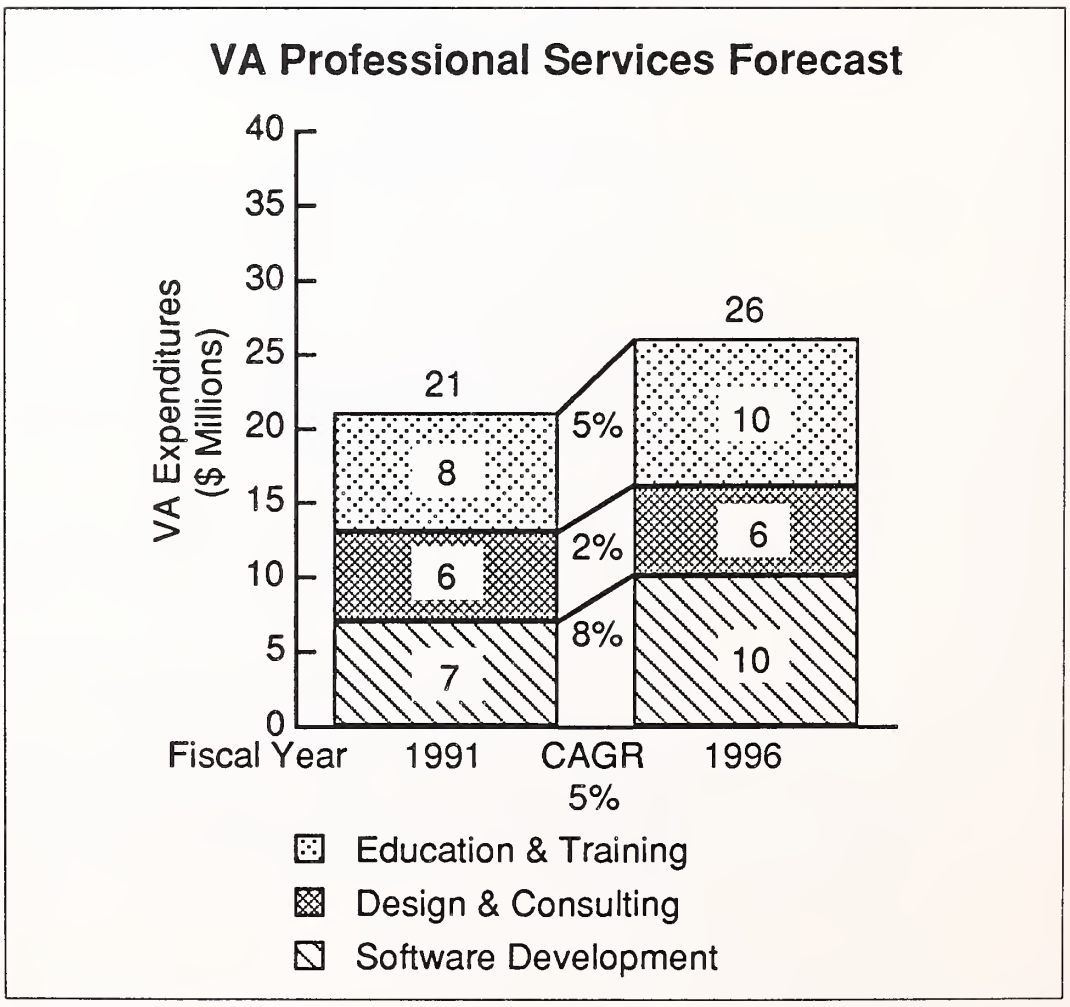
- The growing proliferation of microcomputers throughout VA will fuel the need for software packages that increase the usability of these small systems.

4. Professional Services

VA's professional services market will grow from $21 million in FY 1991 to $26 million in FY 1996, a CAGR of 5%, as shown in Exhibit IV-9. VA's market differs in two ways from the overall federal market:

- While the federal market for education and training is decreasing by 6% each year, VA's market is growing by 5%. The increase stems from at least three factors:
  - VA's relatively high percentage of technical professionals
  - VA's office automation initiatives, which increase training requirements for nontechnical personnel
  - The eagerness of VA personnel to embrace new technologies that will improve service or operations

EXHIBIT IV-9

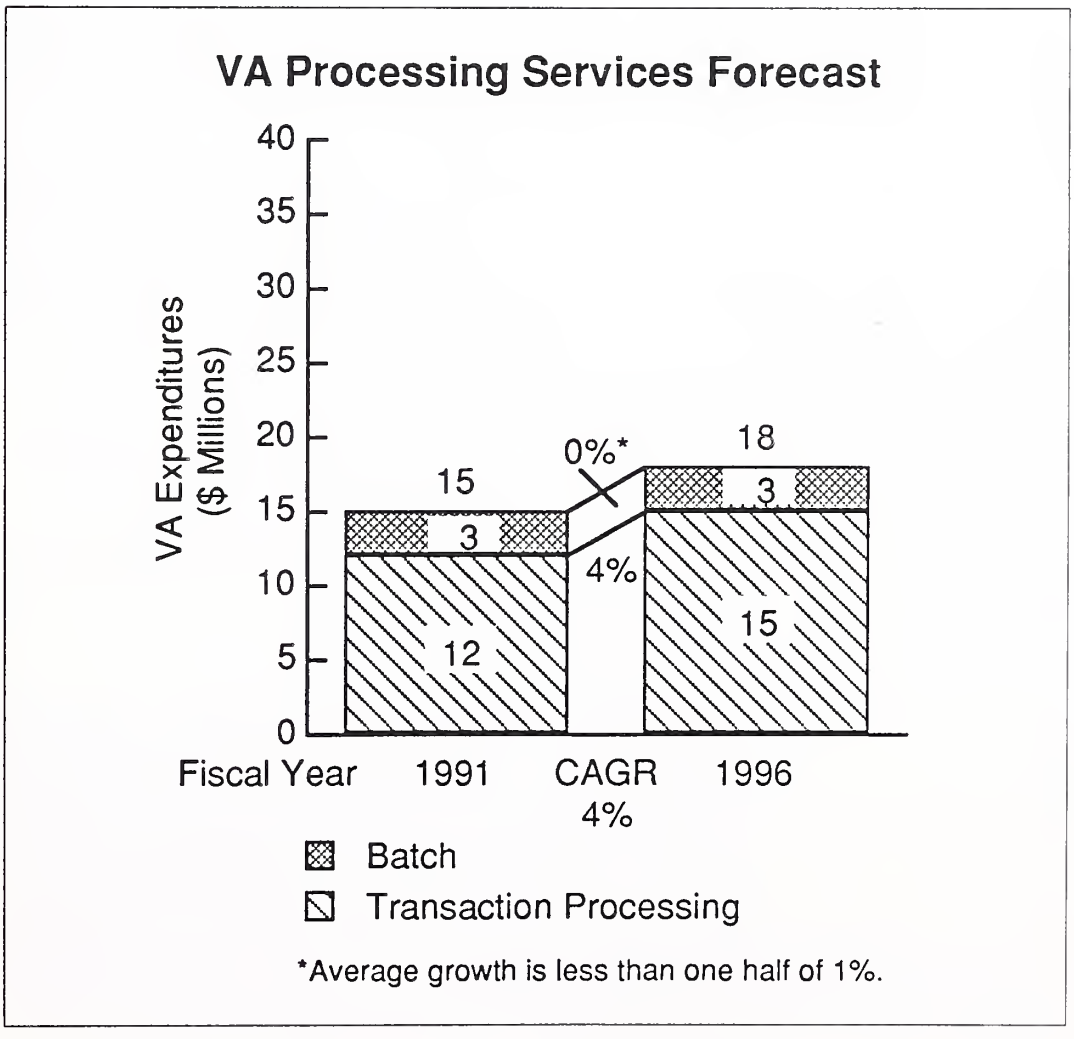


- VA's software development is growing more slowly than in the government as a whole, for the reasons cited in Section 3, above. However, some mission-oriented initiatives—including VBA's Model Station Project, Hospitals' Post-Traumatic Stress Disorder Programs, and new automation initiatives for the 68 active national cemeteries—will still require software development.

5. Processing Services

As noted in Section 1, above, VA has substantially increased its spending on "ADPE Time" and "operations and maintenance," as defined in the government's Exhibit 43A. As a result, the VA market for processing services will grow from $15 million in FY 1991 to $18 million in FY 1996, a CAGR of 4%. These figures are illustrated in Exhibit IV-10. Growth in processing services comes from the transaction processing component (a CAGR of 4%). VA's greater use of some network services will coincide with increases in transaction processing. The rest will come from external data bases, which will aid VA in supporting some of its mission requirements.

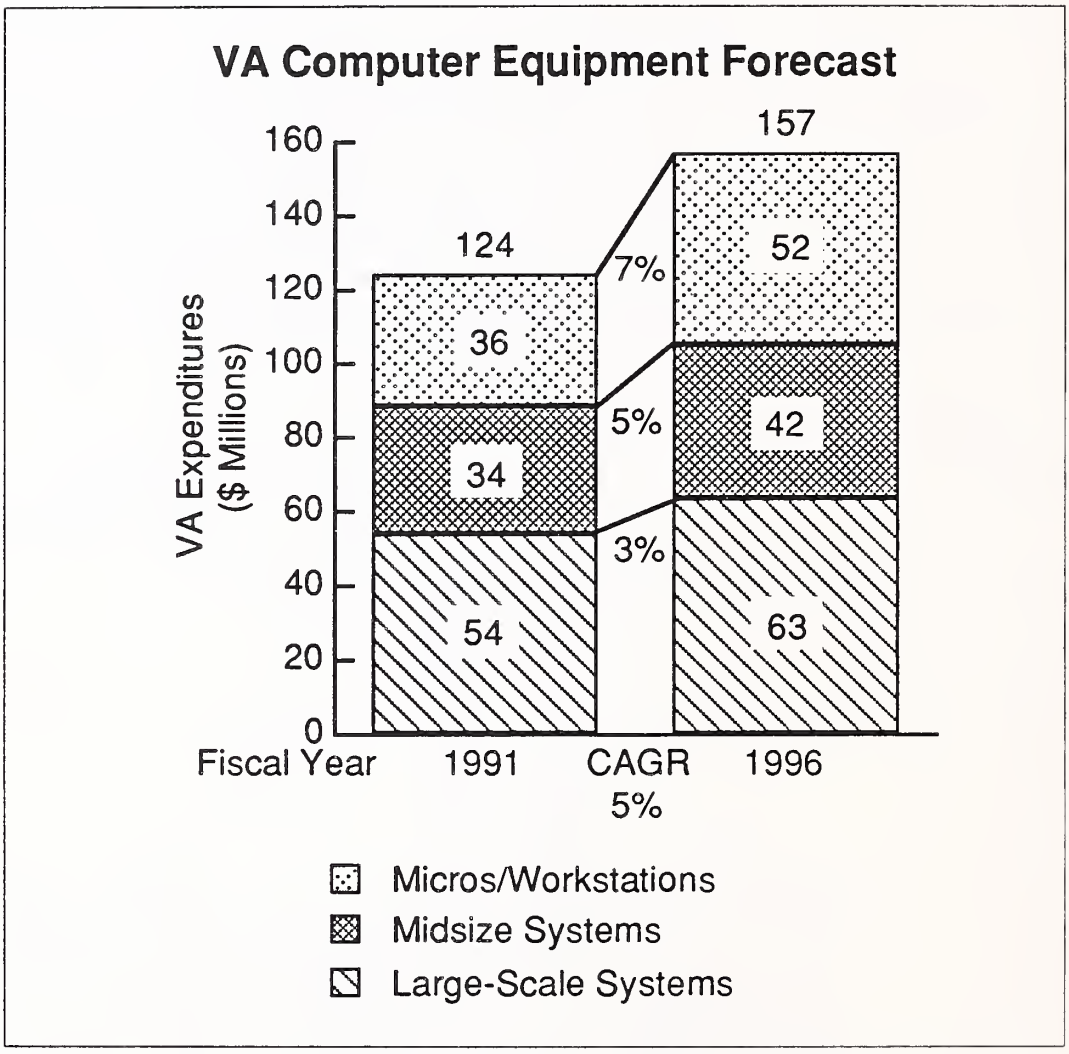
EXHIBIT IV-10



6. Computer Equipment

As shown in Exhibit IV-11, VA's computer equipment market will grow from $124 million in FY 1991 to $157 million in FY 1996, a CAGR of 5%. The large-scale systems market is relatively flat, growing at only half the overall federal rate. Flat growth is partly due to VA's not using supercomputers, unlike many agencies. Most outlays will be used to replace systems at Austin, Hines, and Philadelphia.

EXHIBIT IV-11

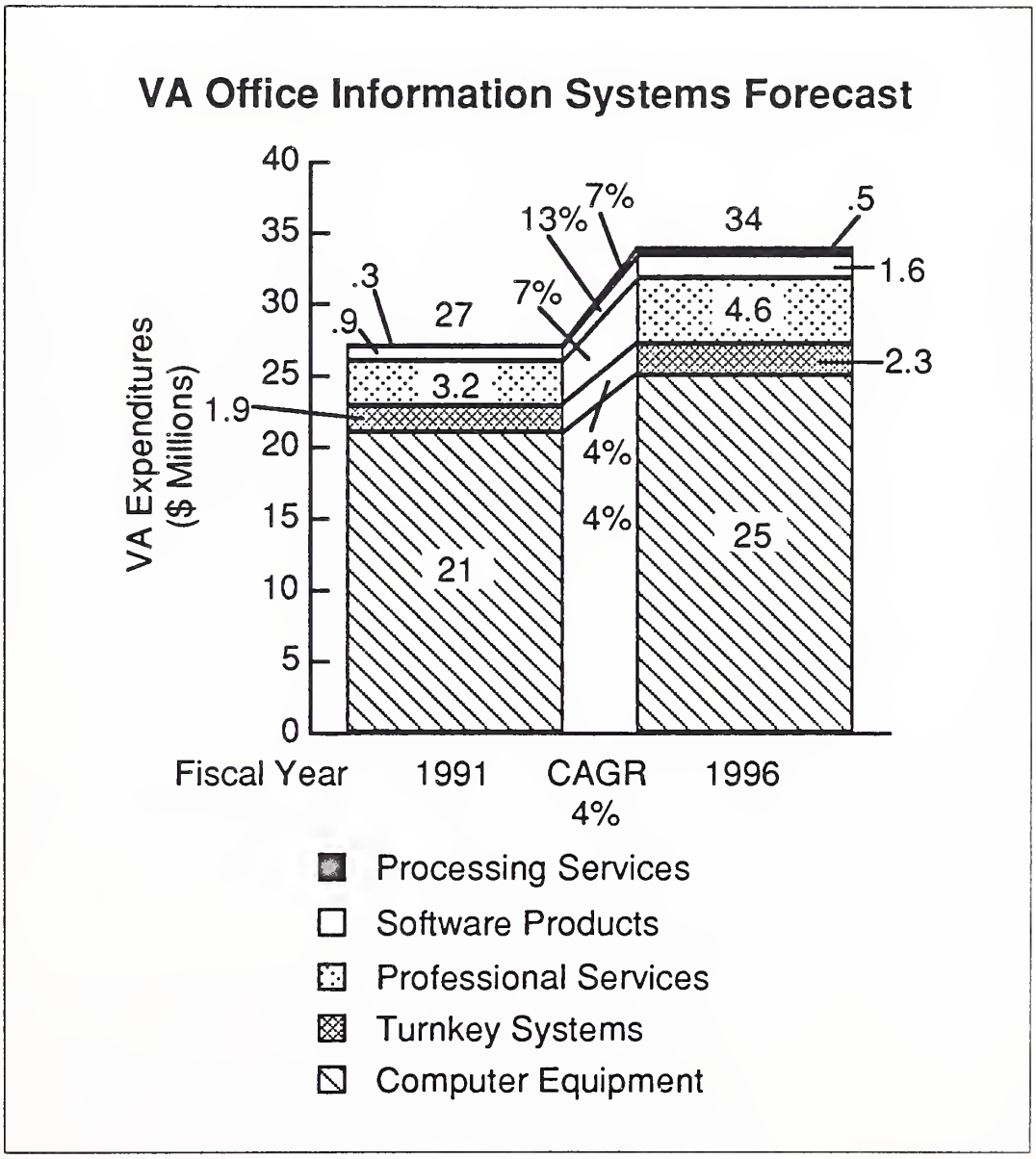


Depending on competing modernization developments in the hospital systems, the midsize market may grow even faster than indicated in the exhibit. Many VA regional offices may also use midsize systems for some local processing needs. The small-end (micros and workstations) market is especially robust, particularly for systems acquired in support of office automation. However, if the VA encounters near-term procurement difficulties, some purchases may be deferred to the latter years of the forecast period.

7. Office Information Systems

End-user computing initiatives, primarily the NOAVA Project, will ensure continued modest growth in VA's office systems market. This market will grow from $27 million in FY 1991 to $34 million in FY 1996, at a CAGR of 4%, as shown in Exhibit IV-12. Hardware acquisitions will absorb the bulk of this spending, but software products will account for the largest growth rate. VA's Executive Information System will also support this growth. VA expects to achieve significant productivity gains through the implementation of office information systems.

EXHIBIT IV-12

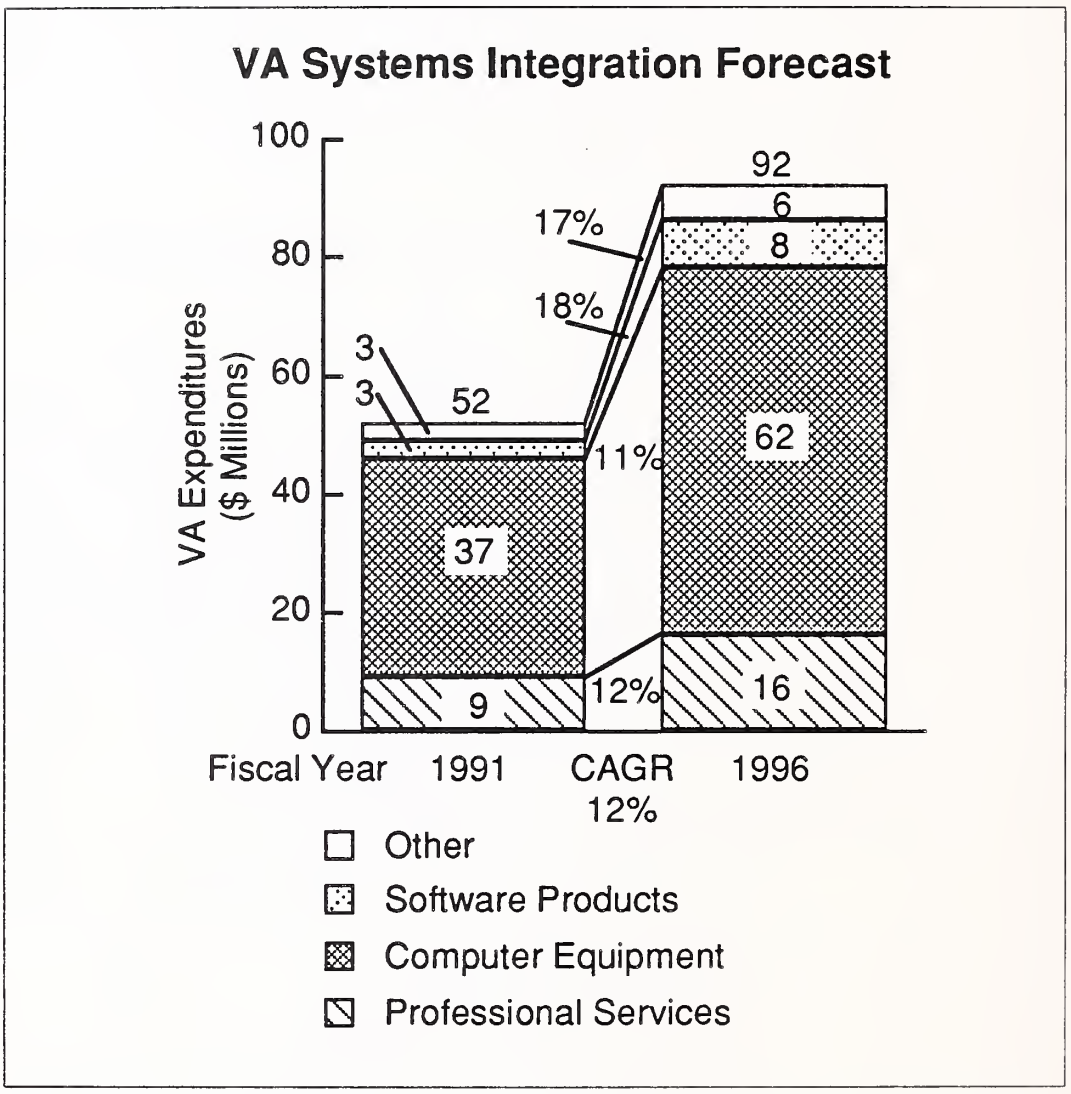


8. Systems Integration

Although it is difficult to gauge the effects of GSA's campaign against Grand Designs, the campaign does not appear to have had any impact at VA. INPUT expects VA's systems integration market to grow from $52

million in FY 1991 to $92 million in FY 1996, a CAGR of 12%. As shown in Exhibit IV-13, the software products and "other" categories will grow fastest. This "other" service mode includes outlays for site preparation, installation, test equipment and tools, and processing services; networks for tests and simulations; and test and acceptance activities.

EXHIBIT IV-13

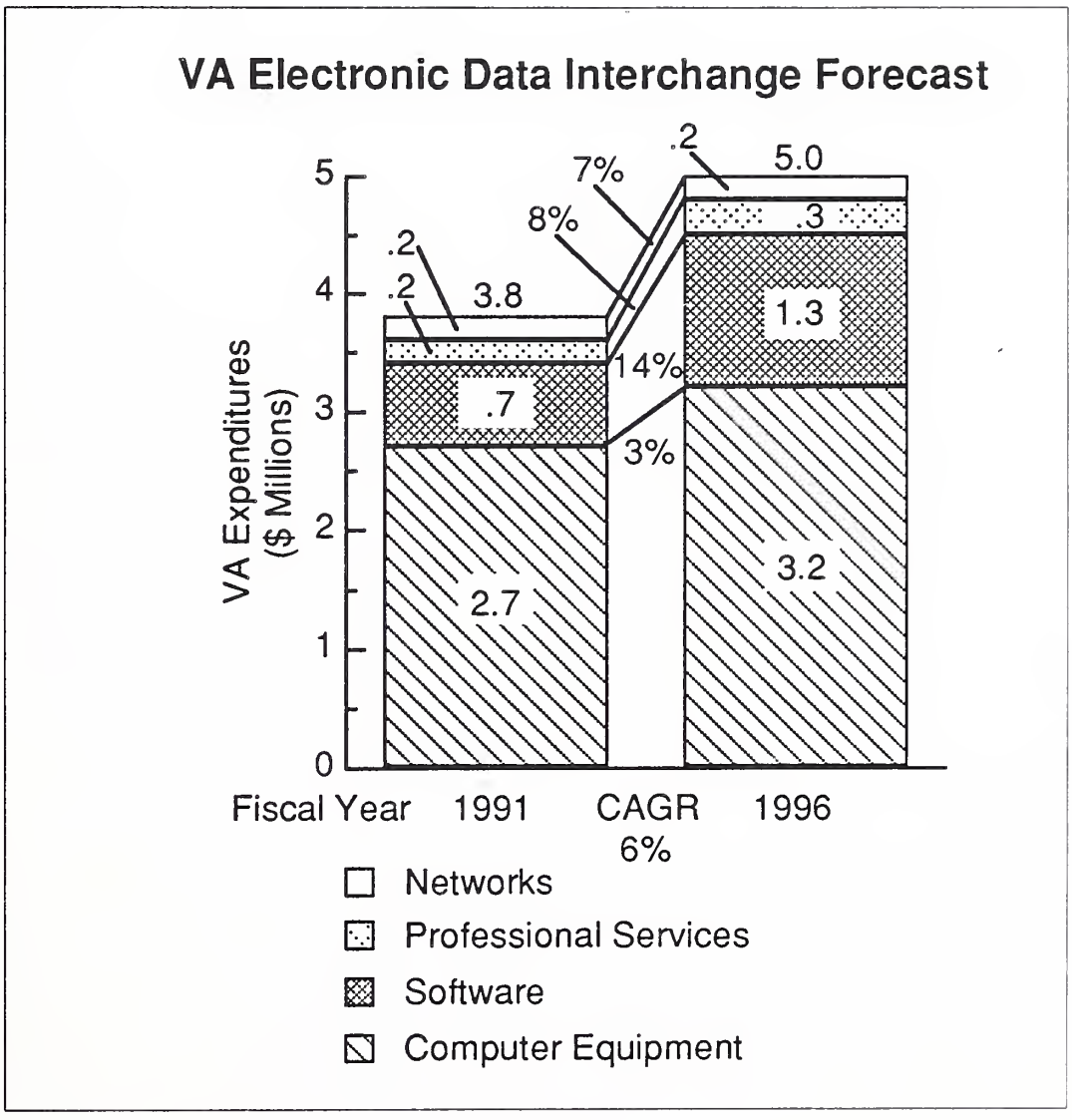


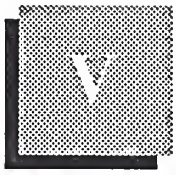
Unlike the situation in the government at large, computer equipment absorbs the largest portion of VA's systems integration market, even though equipment exhibits the smallest growth rate. In VA's planning documents and elsewhere, it has identified several major initiatives driving this market. However, as in other areas, if VA encounters procurement difficulties, the growth rate will likely be much lower.

9. Electronic Data Interchange

Although not as large as some other agencies, VA has made modest efforts in the EDI area. These efforts currently relate to administrative systems associated with finance and accounting. As a result, INPUT expects VA's EDI market to grow from $3.8 million in FY 1991 to $5 million in FY 1996—a CAGR of 6%, as shown in Exhibit IV-14. VA will use EDI, for example, in implementing its Federal Procurement Data System. The Integrated Supply Management System may also take advantage of EDI technology to reduce the paperwork burden.

EXHIBIT IV-14





Major Information Systems Acquisition Plans

The major impetus propelling VA information systems improvements is the desire to share data among VA organizational elements. Integration of new and current systems is key to the quality of service the department provides to veterans. VA is redesigning existing systems and developing new applications based on standards that promote interoperability and interconnectivity. Procurement of standards-compliant products is also expected by VA to reduce software development costs to the department.

Major information systems initiatives and associated opportunities for vendors are discussed in this chapter.

A Major VA Initiatives

Major information systems initiatives occurring during the five-year period covered by this report were identified by VA respondents. See Exhibit V-1 for a ranking in order of frequency of mention.

EXHIBIT V-1

Major VA Initiatives
FY 1991 - FY 1996

Initiatives	Rank*
FMS	1
ISMS	2
PAID Redesign	3
NOAVA	3
DHCP	5
EIS	6

*Rank based on frequency of mention by respondents.

The project most readily identified by respondents was the Financial Management System (FMS), which is sponsored by the Office of Finance and Planning. FMS will utilize commercial off-the shelf applications to standardize VA's commercial accounts-receivable, accounts-payable, and general-ledger systems. The complete FMS will replace Centralized Accounting for Local Management (CALM), Centralized Accounting for Construction Appropriation (CAS-CA), CALM Depot, Financial Reports (Nationwide Balance Trial), InterOffice Accounts (IOA), General Ledger System (GLS), and other manual processes related to the control of VA funds. Price Waterhouse was the recipient of VA's management study for the project. American Management Systems won the contract for supplying JFMIP-compliant off-the-shelf software and support services. FMS is targeted to be operational by late FY 1992. At this time no further contract opportunities exist for this project.

Also very popular with respondents was the Integrated Supply Management System (ISMS). Andersen Consulting won a contract early in 1990 to provide off-the-shelf software and design and integration services. ISMS, an umbrella project for the Office of Acquisition and Materiel Management (OA&MM) within VHS&RA, will administer and automate VA logistics operations at VA Medical Centers (VAMCs), Supply Depots, the Marketing Center, and the Prosthetic Distribution Center. ISMS is replacing the present LOG I system.

One of the systems ranked third was the Personnel Accounting and Integrated Data (PAID) Redesign effort. In-house personnel will direct redesign efforts, and additional equipment will be procured through existing contract vehicles. PAID Redesign is VA's major automation initiative to improve existing automated personnel and payroll systems departmentwide. The Office of Finance and Planning oversees and administers the PAID initiative.

VA's Nationwide Office Automation for the VA (NOAVA) was also ranked third by respondents. A contract is expected to be awarded late in 1990. The Office of Systems Planning, Policy and Acquisition Control (OSPPAC) is handling NOAVA during the procurement process. After contract award, the Office of Customer Support is expected to manage NOAVA. Hardware, software, and services will be offered to more than 600 VA locations through this contract. NOAVA will automate and integrate office functions nationwide. Adherence to GOSIP and POSIX standards is required by NOAVA. The contract's potential value is estimated at $350 million by industry sources. Acquisitions for equipment and services under this contract will be funded by each purchasing organization.

The Veterans Health Services and Research Administration (VHS&RA) continues to standardize information processing capabilities to improve

health care delivery through the Decentralized Hospital Computer Program (DHCP). Because this program was started in 1983 and enhanced in 1988, respondents did not mention this program frequently. DHCP provides computer support for VAMCs. Conceptually DHCP consists of a set of functional applications intended to evolve into an integrated medical center system. CORE modules have been developed and are operational for medical administration, pharmacies, and clinical laboratories. Enhanced DHCP consists of radiology, dietetics, medical records tracking, IFCAP (integrated funds distribution, control point activity, accounting, and procurement), surgery, Decentralized Medical Management Systems, nursing, and mental health. Enhanced modules are substantially developed and will be implemented in conjunction with hardware augmentations. Acquisitions for equipment and peripherals should end by FY 1996. Separate RFPs for individual system components will be issued wherever possible. Software development efforts have been performed by VA personnel. Although not announced, VHS&RA hopes to implement image technology to integrate textual documents with graphics of patient records (X-rays and electrocardiograms) as a DHCP module during the next few years.

Also receiving mention by respondents was the Executive Information System (EIS), a component of the Enterprise-wide Information System managed by the Office of Information Resources Policies (OIRP). OIRP's responsibilities include furnishing IRM reporting systems VA-wide. Enterprise will present on-line department data to VA executives and managers. Final implementation of Enterprise is expected during FY 1997. The EIS component will rely on user-friendly decision support tools for agency executives. It is expected to supersede the Automated Management Information System (AMIS) and the VA Information Locator System (VAILS) in FY 1995. Existing resources will be used to develop and implement EIS; contractor services will not be required, at least as the system is currently planned.

Surprisingly, respondents neglected to mention the VBA Modernization effort as one of the major VA initiatives. Aside from NOAVA, it is the only large-scale contractor effort acknowledged by VA at this time. VBA is hoping to release an RFC shortly to solicit vendor comments. VBA intends to modernize and automate all veteran benefits delivery systems. The VBA Modernization effort will be conducted in segments allowing testing and corrections during the multiyear transition to a modernized ADP environment. Procurements will include telecommunications and other equipment for regional offices (terminals; printers; midsize and microcomputer systems), peripherals, optical scanning devices, and mainframe computers. Full implementation is now targeted for late 1996.

Vendors' perceptions of the major programs differ from those of agency respondents. Vendors principally mentioned the two active VA procure-

ments, not agency in-house efforts. As shown in Exhibit V-2, NOAVA and VBA Modernization were cited with considerably higher frequency than any other initiative or need. Only two projects appear significantly lucrative to contractors at this time.

EXHIBIT V-2

Vendor Perceptions of Major Program Initiatives, FY 1991 - FY 1996

Programs	Percent of Responses*
NOAVA	53
VBA Modernization	53
Extend imaging	20
Austin Replacement	7
Payroll	7
Hospital administration	7
Integration with DoD systems	7
General professional services	7

*Will not add to 100%; multiple responses were allowed.

Other projects were mentioned infrequently. INPUT expected integration with DoD systems to be cited more often by respondents. Currently, verification of service records is conducted manually between VA and the DoD. According to a recent GAO report, VA waits approximately two months for records verifying military service. If VA is to improve veterans' services, approval processes must be automated between VA and DoD.

Vendors expressed concern that although VA executives pay public lip service to the role contractors will play in modernizing and integrating VA information systems, few procurements for services or products have been announced by the department. Both respondent groups agree that there are a limited number of opportunities for vendors at VA.

Other than NOAVA and VBA Modernization procurements, contractors interested in VA business will have to pursue smaller initiatives at VA's regional offices and medical centers.

VI

Acquisition Plans and Procedures

A

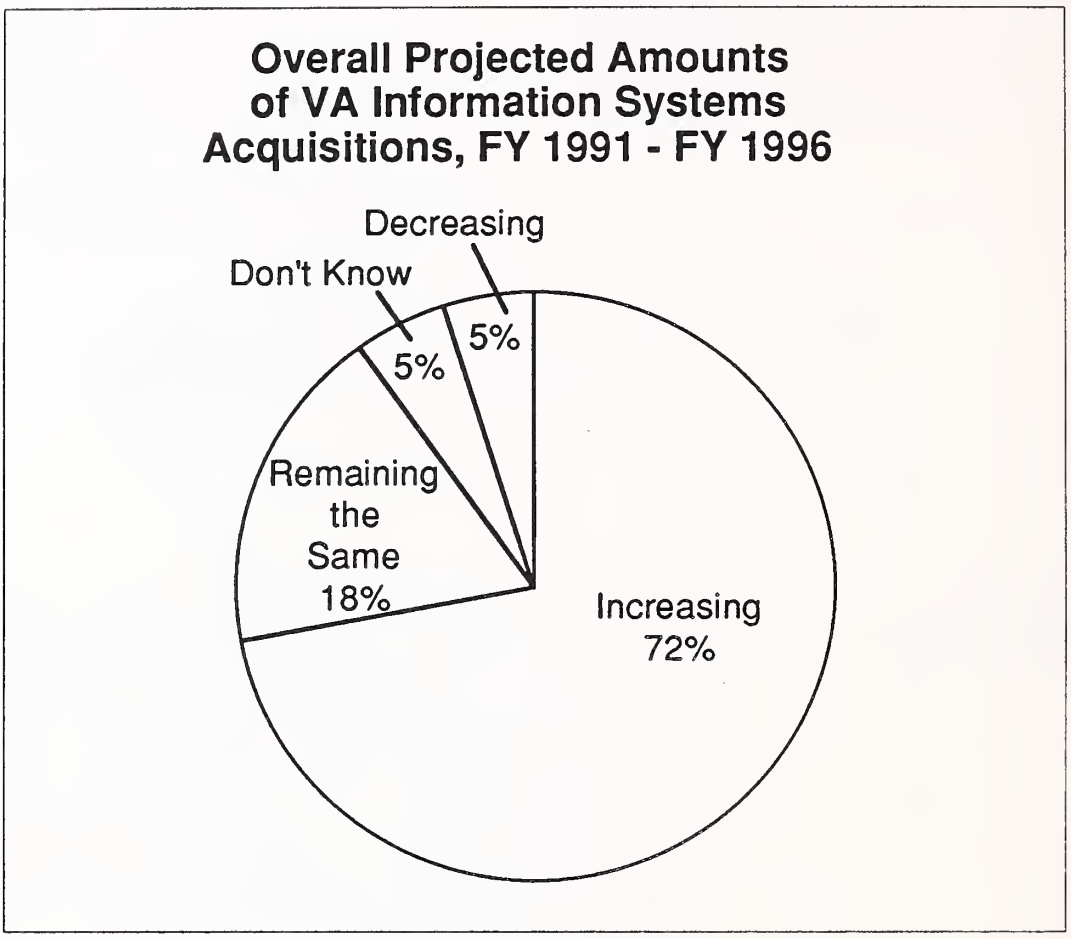
Changes in Contracted Services

Existing VA information systems are undergoing modernization, and other functions are being automated to improve critical medical and benefits services offered to veterans. For example, the Veterans Benefits Administration Modernization program, which will span several years, has just begun. The VA-wide office automation program, NOAVA—scheduled for contract award during October 1990—will provide a toolbox of OA solutions. An interoperable network of voice, data, image, text, and telecommunications will promote interconnectivity at the end-user level across all VA departments, offices, medical centers, etc.

INPUT asked department respondents if the number of information systems and services acquisitions would change to fulfill these and other VA modernization efforts. Overall, almost three-quarters believed that IS procurements would increase during the next five years. As shown in Exhibit VI-1, fewer than 20% of respondents projected that acquisitions would remain at their current levels, and 5% of respondents forecasted decreases in systems and services procured from vendors.

Projected changes in acquisitions by IS service category are presented in Exhibit VI-2. Respondents expect more increases in acquisitions of software products, systems integration services, hardware, and network services than in other IS areas. Respondents' answers mirror the stated directions of VA's modernization program. Readily available off-the-shelf software will be utilized rather than custom-designed applications. Network and systems integration services are expected to grow—based on department projections—to link existing and newly developed systems that assure interoperability and interconnectivity of information resources. Purchases of new hardware will replace an aging inventory as well as bring new technology into critical mission functions.

EXHIBIT VI-1



Fewer respondents expect increases in processing services, professional services, and turnkey systems—these expectations reflect the agency's limited use of these services from vendors. The agency maintains data processing centers at four locations: Austin (TX), Hines (IL), Philadelphia (PA), and Washington, DC. VA rarely contracts ADP to outside vendors. On the contrary, VA is currently holding discussions on the feasibility of offering Austin's data processing services to other agencies on a fee-for-service basis.

Turnkey systems have had little applicability in delivering VBA, NCS, and VACO services, but are used in providing medical and hospital functions.

Because of a combination of factors, professional services contracts were not expected to increase as much as other service areas. Increased VA dependence on off-the-shelf solutions, and a large repository of in-house technical personnel, negate the use of contractor development assistance. Unlike other agencies, VA has always had a highly sophisticated IRM staff residing at VACO and in VHS&RA field locations. Many programming efforts are developed and implemented using VA personnel. However, if VA begins encountering the same staff shortages as other agencies, this situation might change.

EXHIBIT VI-2

Projected Changes in Information Systems Acquisitions by Service Category— VA Respondents, FY 1991 - FY 1996

Service Category	Respondents Expecting Increase	Average Increase Predicted	Respondents Expecting Decrease	Average Decrease Predicted	Respondents Expecting Same Amount
Professional Services	43	60	7	N/A	50
Software Products	79	25	0	-	21
Processing Services	33	N/A	33	N/A	33
Systems Integration	77	25	0	-	23
Network Services	69	27	0	-	31
Turnkey Systems	42	10	8	N/A	50
Hardware	71	21	0	-	29

Note: Based on total number of survey respondents.
N/A = not available.
Columns one, three, and five add to 100%

The increases forecasted by respondents are extremely optimistic, and are not in line with INPUT's forecast, which predicts an overall compound annual growth rate of 7%. INPUT projects more-modest predications that range from 4% to 14% for each service/delivery mode over the next five years. Respondents' expectations are based on VA's overall modernization thrust and do not reflect contractor opportunities.

Respondents discussed VA's information architecture directions to verify the stated directions outlined in the agency's 1989 Information Systems Plan. Respondents' perceptions are listed in Exhibit VI-3. Almost half confirmed that VA was heading toward decentralization of IS processing as a by-product of downsizing hardware systems. Less mainframe dependence and increased end-user operation of PC-based processors are both changing the flow of information processing VA-wide. Midsize systems use is also declining and will probably be limited to client-server roles as smaller, more powerful hardware is networked to provide communications to other systems.

EXHIBIT VI-3

Information Architecture Directions, FY 1991 - FY 1996

Architecture Directions	Percent of Responses*
Decentralization/Downsizing	47
Integrated Systems	40
On-Line/Interactive	20
RDBMS Use	7

*Does not add to 100%; multiple responses possible.

VA hopes to achieve interoperability and interconnectivity among most classes of information systems across VBA, VHS&RA, NCS, and VACO. Links with DoD systems are also under discussion. Respondents noted that integration of information systems was one of the critical directions of IRM architecture at VA. On-line, interactive use of systems is crucial for many patient and benefit services. Many existing systems run in batch mode but without immediate on-line access and cause needless delays in providing services to veterans and their families.

A few interviewees mentioned the use of relational data bases as vital to extended data accessibility for more users through decentralized and

integrated systems. Data bases that rely on relational foundations promote data sharing among VA components.

B

Application Areas

Respondents were asked which functional areas were expected to use information technology more effectively over the next five years. Responses are ranked in Exhibit VI-4. Medical systems that assist in delivering patient care and document patient records were mentioned most frequently. The Decentralized Hospital Computer Program (DHCP) will continue to strive for improved patient medical care through development and dissemination of computer technology across VAMCs and VA hospitals.

EXHIBIT VI-4

VA Functional Areas Expected to Use IS More Effectively, FY 1991 - FY 1996

Functional Areas	Rank*
Medical Care	1
Financial Management	2
Logistics	2
Benefits Delivery	2
Office Automation	5
Cemetery Management	6

*Based on frequency of mention by respondents.

Agency financial systems responsible for order processing and accounting needs was one of the second most frequently mentioned functional areas. VA is currently defining the requirements for its Financial Management System (FMS) and is expecting to make full use of off-the-shelf software and to standardize agency accounting functions.

Another functional area that will benefit from IS is logistics. VA's decentralized Integrated Supply Management System (ISMS)—recently awarded to Andersen Consulting—replaces LOG I. ISMS will support warehouse inventory, procurement, and EDI to centralized accounting

and payment systems, depot storage, and distribution. Logistics contracting will be centralized while logistics processing becomes more decentralized. The contractor will design and integrate ISMS modules.

Benefits delivery systems were another highly ranked functional area that will take advantage of information technology over the next few years. The VBA is just beginning its modernization program of benefits delivery systems that extend hardware, software, and telecommunications capabilities across all regional offices.

Office automation was ranked fifth by respondents. Under the NOAVA contract, a single vendor will provide all office automation equipment, services, and technical support to more than 600 VA locations across the VA. Many manual office functions will be automated and offices will be integrated with existing systems and networks.

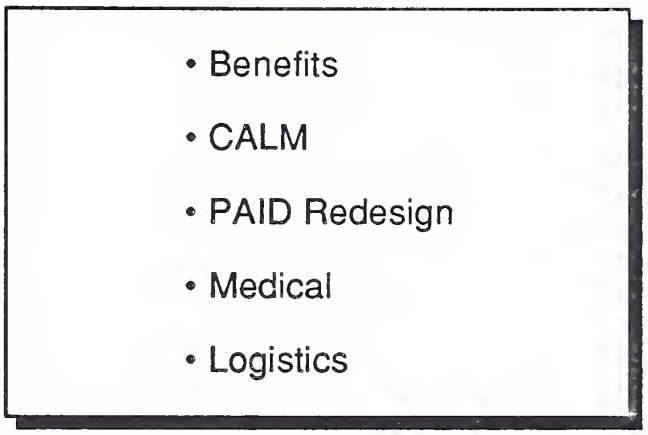
Cemetery management was also mentioned. The NCS has been the slowest part of VA to adopt information technology. Currently, manually intensive administrative processes are being automated for 68 national cemeteries, 3 national cemetery offices, and NCS activities at VACO.

The list of specific batch applications that need to be upgraded to on-line systems does not vary greatly from the functional areas identified by respondents, as shown in Exhibit VI-5. Respondents mentioned the Centralized Accounting and Local Management system specifically. FMS intends to replace CALM, which is being developed using the Federal Financial Systems package that is available from American Management Systems. This package is compliant with the core requirements of the Joint Financial Management Improvement Program (JFMIP).

The PAID Redesign effort is underway and is improving and automating a centralized payroll and personnel system. Professional services and hardware associated with this effort are being procured through existing contract vehicles.

EXHIBIT VI-5

VA Batch Applications Intended for On-Line Transactions



Note: Listing based on multiple mentions for each application.

In general, most application software runs in a three-tier equipment environment at the agency, as depicted in Exhibit VI-6. Applications associated with office automation—such as word processing, electronic mail, and electronic publishing—are confined to midsize systems and microcomputers. Midsize systems are increasingly employed as file servers in microcomputer LAN environments.

As INPUT expected, VA logistics functions are housed on mainframe systems that can process large-volume transactions. Logistics data are then downloaded to microcomputers to facilitate order processing and distribution.

EXHIBIT VI-6

Hardware Classes Employed for VA Applications

Application Types	Hardware Class		
	Mainframe	Midsize	Micro
Information Analysis	X	X	X
Human Resources/ Payroll	X	X	X
Word Processing		X	X
Electronic Mail		X	X
Electronic Publishing		X	X
Graphics	X	X	X
Logistics/Distribution	X		X
Accounting	X	X	X
Management Systems	X	X	X
Scientific/Engineering	X	X	X
Project Management	X	X	X
Benefits	X	X	X

C

System Connectivity Requirements

VA's current hardware environment is composed of a variety of manufacturers' systems. The agency recognizes that connection of disparate and often proprietary systems is vital to provide information sharing and access VA-wide. As shown in Exhibit VI-7, VA respondents specified manufacturers' names when asked to identify types of equipment that needed to communicate. Although the sample overwhelmingly indicated that agency equipment required interconnectivity, 27% said all systems needed to communicate with each other. The exhibit lists specific hardware systems targeted for connectivity to other equipment.

EXHIBIT VI-7

Frequently Mentioned Systems Interconnectivity Needs

Systems That Are/ Will Be Connected	Percent of Responses*
Amdahl to Honeywell	26
Amdahl to DEC	20
DEC to Honeywell	20
Amdahl to Wang	13
DEC to IBM	13
DEC to Wang	13
Other	53

*Will not add to 100%, due to multiple responses.

Note: 100% of the sample stated VA systems needed to communicate with other equipment; 27% specified all systems should connect with each other.

Respondents were also asked to identify system connectivity products needed by the department to provide interproduct communications. Most respondents could not name products specifically. Products mentioned are listed in Exhibit VI-8 and include protocols, standards, and interface methods. All are commonly used to perform systems interconnectivity.

EXHIBIT VI-8

VA System Connectivity Products

- File transfers
- SNA
- TCP/IP
- Protocol conversion boxes
- HDLC/SDLC
- X.25 and X.400 protocols

D

Selection Criteria

The average ratings by VA respondents of the relative importance of each criterion in the selection of information systems and services contractors are presented in Exhibit VI-9. Life cycle cost received the highest average rating of the six criteria, 4.5 on a five-point scale. Budget/funding issues continue to be of concern to federal agencies. As a result, contracting officers usually confer awards to lowest bidders. The technical solution proposed by vendors was rated almost as high as life cycle cost. Agency ratings reflect the respondents' knowledge of who actually makes award decisions and their desire to give the technical solution parallel importance. Contract type was rated the lowest, 3.0, because it is considered the least important—most VA contracts are fixed price.

EXHIBIT VI-9

Average Ratings of Criteria Used in Selection of IS Contractors

Selection Criterion	Average Rating*
Life Cycle Cost	4.50
Technical Solution	4.43
Project Management Skills	3.79
Initial Cost	3.75
Risk Containment Procedures	3.06
Contract Type	3.00

*Based on 1 to 5 scale; where 5 = extremely important to consider, and 1 = not important to consider at all.

E

Contract Preferences

VA rarely strays from the use of fixed-price contracts, as corroborated by vendor respondents in Chapter VII. Agency respondents were asked what types of projects would be the exception—that is, would use other contracting vehicles. Exhibit VI-10 lists responses. Note that 50% of the sample indicated that, to its knowledge, VA does not deviate from fixed-price contracting.

EXHIBIT VI-10

Projects That Should Use Variable-Price Contract Vehicles

- Research and development
- Professional services
- Minimally defined requirements

The few exceptions that were mentioned refer to professional services in general, research and development assistance from contractors, and projects minimally defined by the agency. These types of projects can be performed more successfully if contractors have more flexibility. Contractors feel more comfortable with variable-price contracts that accommodate changes in requirements to bring a project to successful completion. Fixed-price contracting confines a vendor to completion of projects under a price ceiling that cannot respond to changing or ill-defined agency requirements.

F

Acquisition Factors/Trends

Information systems and services acquisitions are often affected by general industry trends and advances in new technology. VA, like other federal agencies, is dependent on technology to strengthen its delivery of medical care, benefits, and burial services to U.S. veterans. Industry trends and technologies that respondents perceived will impact VA's acquisitions of computer systems and services are listed in Exhibit VI-11.

EXHIBIT VI-11

Industry Trends and Technologies Impacting VA's IS Acquisitions

- Off-the-shelf software
- OSI standards
- Networked systems
- Systems downsizing
- Image technology

The proliferation of off-the-shelf application packages, especially in the medical and financial areas, makes it easier to add new systems to the information architecture of the agency.

Software that is OSI compliant and allows data sharing and system interoperability between various hardware systems was also mentioned in the agency sample. To achieve systems integration, VA continues to adopt standards as they emerge in the areas of telecommunications and data interchange. The current NOAVA procurement will support compliance with GOSIP and POSIX standards. Future procurements, including those in the VBA Modernization Plan, are also expected to follow these two standards and to utilize SQL-based data bases when appropriate.

Most VA programs are dependent on information contained in other operational systems. VA should institute network configurations to integrate systems communications. Networking, a new trend within the information technology marketplace, and new products that provide connectivity are continually introduced. The use of EDI, for example, will streamline logistics functions and expedite supply fulfillment functions, payment for materials, and benefits. Local-area networks (LANs) and wide-area networks will play active roles in facilitating information exchange across systems.

Networked personal computers facilitate downsizing of many applications and are crucial to the exchange of information among large numbers of users. Mainframes and midsize systems are becoming less critical to information storage and retrieval. The availability of powerful, smaller, less-expensive computers and workstations allows VA to purchase hardware that satisfies decentralization and modernization requirements. End users can access and manipulate data that assist in providing veterans' services and information to VA program management.

New technological advances in image management systems will greatly reduce paper-intensive processes for medical records storage and benefits determination systems. VA has already developed prototype systems employing this technology. However, conversion costs currently prohibit wide implementation of image systems.

Other factors and external pressures that respondents viewed as impacting VA's acquisitions of information systems are ranked by frequency of mention in Exhibit VI-12.

EXHIBIT VI-12

Other Factors Impacting VA's IS Acquisitions

Factors	Rank*
Budget cuts	1
Legislation	2
Additional Reorganization	3
War	4
Fee-for-Service Agreements	5

*Based on frequency of mention.

Respondents believed budget problems were most significant. However, one must remember that VA historically has not significantly cut programs in response to federal budget directives. Respondents were basically echoing concerns expressed by most agencies during the FY1991 budget negotiation process. In fact, most respondents did not foresee program initiatives being totally cut from VA's budget, just delayed if necessary. Budget cuts causing staff reductions would, on the other hand, foster increased reliance on VA information systems.

New legislation has positive implications for VA information systems. New legislation invariably translates into additional veterans benefits or services that must be delivered with the assistance of VA information systems.

The elevation of VA to cabinet-level status led to creation of the Office of Information Resource Management, changed the IRM structure within the agency, and fostered more-integrated strategic planning. A little over a year later, a shift of IRM responsibilities transferred control of three of the four data processing centers to organizations more closely attuned to user needs. The full impact of this recent organizational change is as yet unknown. Some VA components view it negatively and assume that it will foster further decentralization of IRM planning and responsibilities, when the department should be concentrating on centralizing these efforts. Others welcome the management changes because operational control has shifted to VA organizations that are more directly involved in the day-to-day delivery of services to veterans.

Department respondents also indicated U.S. involvement in a war with Iraq would increase the amount and type of benefits provided to veterans, and place additional demands on VA information systems.

Discussions are currently underway to use the facilities at the Austin Data Processing Center to provide IS services for other agencies on a fee-for-service basis. Hardware and software requirements for Austin DPC would need modifications if this plan is approved. In particular, VA would need to institute a more rigorous chargeback system.

VII

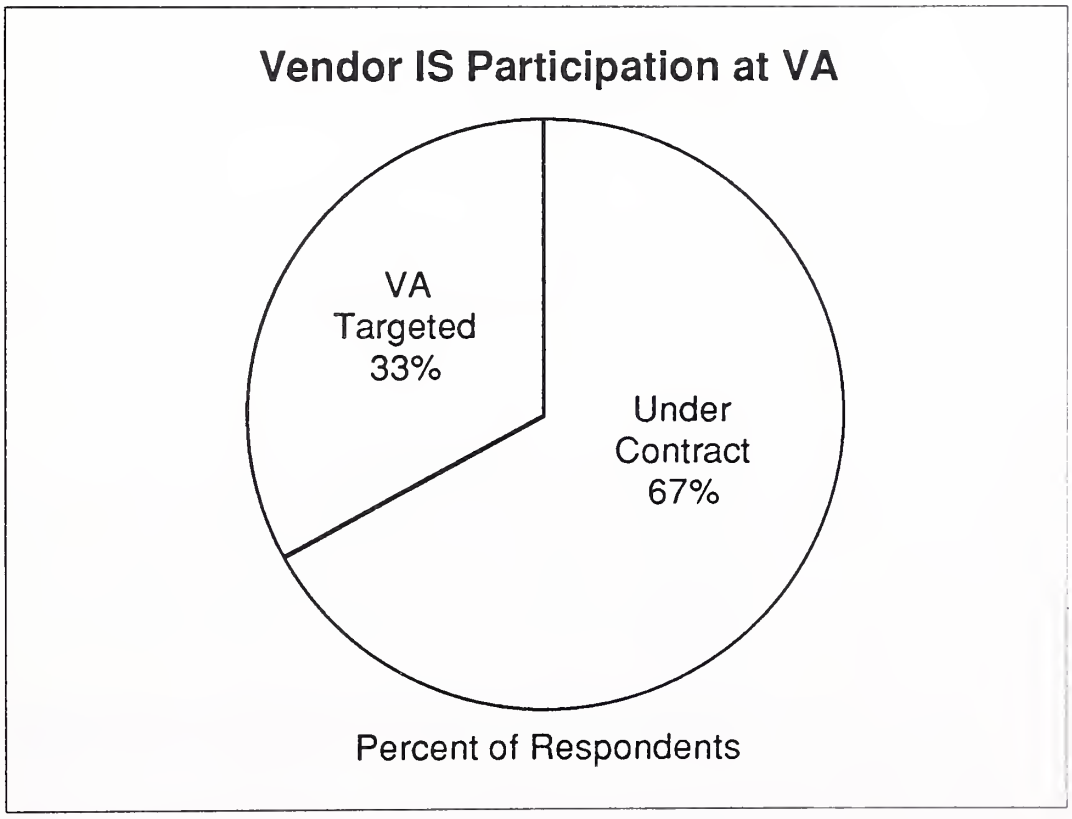
Vendor Views

A

Products and Services

The industry respondents who participated in this study were vendors that had contracts with VA or were seriously hoping to win contracts over the next five years. As shown in Exhibit VII-1, two-thirds of those surveyed were currently under contract. The remaining third identified VA as a marketing target for IS products or services.

EXHIBIT VII-1



The categories of information systems and services supplied by vendors to VA are ranked in Exhibit VII-2. Current and planned IS products and services were ranked by frequency of mention from respondents. The distribution of vendor-provided products/services in response to per-

ceived changing VA requirements from FY 1991 through FY 1996 is different from the distribution of the past. In FY 1989, more vendors were furnishing professional services, hardware, and software products to the agency than other IS products or services. Although vendors expect professional services to continue as the principal vendor-provided service to VA, vendors expect shifts in other product/service offerings.

EXHIBIT VII-2

Vendor Ranking of Current and Planned IS Provided to VA

Systems/Services	Rank*	
	FY 1989	Planned to FY 1996
Professional Services	1	1
Software Products	3	5
Processing Services	7	7
Systems Integration Services	5	2
Network Services	3	4
Turnkey Systems	6	6
Hardware	2	3

*Rank based on frequency of mention by respondents.

Surprisingly, fewer vendors anticipate supplying software products to VA by FY 1996. Less emphasis is expected because this market is already saturated with similar-looking applications. Although VA intends to purchase more off-the-shelf solutions rather than custom applications, fewer vendors will try to capture this business.

Vendors expect to offer more systems integration services to VA because of department intentions to integrate and upgrade existing systems.

Most of the vendors were not currently supplying processing services, nor were they anticipating offering this service over the next few years. VA data processing centers located in Philadelphia (PA), Hines (IL), Austin (TX), and Washington, DC will continue to provide major information processing functions to the department.

Respondents were also asked which categories of information systems and services held the most attractive opportunities at VA for their companies over the next five years. Exhibit VII-3 presents their perceptions in order.

Although responses were similar to Exhibit VII-2, planned services and attractive opportunities do not necessarily have the same meaning. Planned services indicate frequency, not potential revenues. Vendor perceptions of professional services, systems integration services, and network services as the top-three most attractive categories of opportunities also coincide with VA's overall modernization directions. Existing systems are mostly run under batch procedures and do not communicate with each other.

EXHIBIT VII-3

Vendor Ranking of Most Attractive IS Opportunities at VA

Systems/Services	Rank*
Professional Services	1
Systems Integration	2
Network Services	3
Hardware	4
Software	4
Turnkey Systems	6
Processing Services	7

*Rank based on frequency of mention by respondents.

Current central reporting efforts are minimal within the three major departments. VACO is currently trying to provide IRM strategic planning to integrate and upgrade the three departments' decentralized processing systems. Discussions are also underway to link VA with DoD systems.

Vendors that participated in this study often found advantages in teaming with other vendors as a subcontractor or teaming partner to augment

market presence at VA. As Exhibit VII-4 reflects, vendors tend to function as teaming partners or subcontractors when multiple services are required by a contractor. For example, within systems integration projects, a single vendor usually does not have the requisite skill set or technical expertise in the needed variety of technologies or services.

EXHIBIT VII-4

Vendor Participation with Other Contractors in VA Contracts

Systems/Services	Percent of Respondents Providing Services as a Subcontractor/ Teaming Partner*
Professional Services	73
Software Products	50
Processing Services	12
Systems Integration Services	38
Network Services	40
Turnkey Systems	25
Hardware	25

*Does not add to 100%; multiple responses were allowed.

B

Changes in Contracted Services

The majority of industry respondents in this study anticipate changes in the amount of IS their companies will furnish to VA over the next five years. Exhibit VII-5 indicates the percentage of respondents expecting changes in each category of IS. The exhibit at first glance can be misleading. Although 92% predicted changes in contracting with VA, they did not always specify whether increases or decreases were expected.

Overall, more vendors estimated increases in SI and professional services contracts. These vendors hope VA will depend more on contractor services as department modernization efforts gain more momentum. Numerous older batch systems need to be recoded and/or upgraded. Communication between existing and new systems may additionally require assistance from SI contractors. Network services and software products were the next promising categories for new contracting from

VA. Few respondents anticipate decreases—vendors are optimistic about winning more contracts over the next few years.

EXHIBIT VII-5

Vendor-Expected Changes in Contracting for IS at VA, FY 1991 - FY 1996

Service Category	Percent*	
	Expecting Increase	Expecting Decrease
Professional Services	42	-
Software Products	33	4
Processing Services	4	-
Systems Integration	50	4
Network Services	33	13
Turnkey Systems	25	-
Hardware	25	8

N/A = Not Available.

*Based on the total number of respondents.

Note: 92% anticipated a change in the amount of IS their companies would provide to VA through FY 1996.

C

Selection Criteria

When VA evaluates bids, vendors believe cost factors are the most important criteria for award decisions, as shown in Exhibit VII-6. This view is not entirely at odds with views expressed by agency and industry respondents in INPUT studies undertaken since 1989. Procurement practices within the federal government are apparently changing. Prior to 1989, the proposed technical solution was usually ranked first by respondents, with cost factors placing second or third.

EXHIBIT VII-6

Vendor Perception of the Relative Ranking of Criteria Used in Selection of IS Contractors

Selection Criteria	Vendor Ranking*	Agency Ranking**
Life Cycle Cost	1	1
Initial Cost	2	3
Technical Solution	3	2
Risk Containment Procedures	4	4
Contract Type	5	5

N/A = Not Available.

*Based on average rank score by respondents.

**Based on average ratings by respondents.

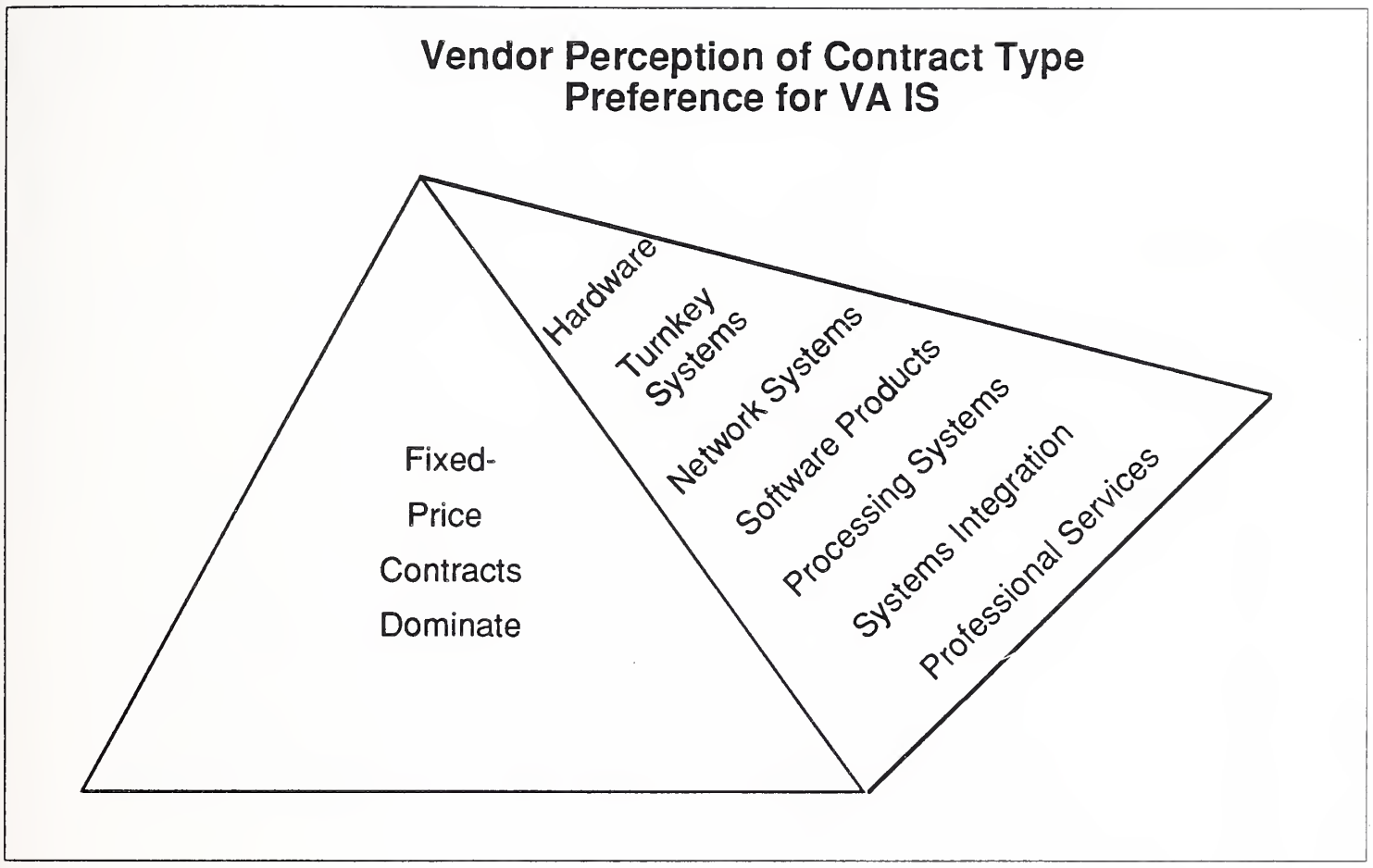
D

Preferred Contract Types

Vendors in this study unanimously believed VA prefers fixed-price contracts for all information systems and services acquisitions, as shown in Exhibit VII-7. Department respondents and industry respondents agree that VA prefers fixed-price contracts. The use of fixed-price contracting has been growing within the federal market over the past several years. This contract form places the burden of the overall contract responsibility on the vendor. Fixed-price contract vehicles are often used to ensure a vendor's performance. However, such vehicles are not always appropriate for services or products. Fixed-price contracting is rapidly becoming the norm, and thus often sacrifices the government's ability to change to specific new requirements.

Products such as off-the-shelf software packages and computer hardware lend themselves easily to fixed-price contracts. Vendors see services such as consulting and systems integration as more successful if some flexibility and/or additional incentives are provided to the contractor.

EXHIBIT VII-7



E

Factors/Trends Affecting VA Spending

Industry respondents to this study suspect that VA IS procurements have never been subject to rigorous federal budget constraints. As shown in Exhibit VII-8, 55% observed minimal or no impact on IS procurements. Some vendors stated VA had never proposed ambitious plans that would have necessitated equally high funding requests. Large-agency IS procurements usually become easy targets for congressional funding cuts. Smaller procurements attract less congressional scrutiny because fewer appropriations are requested in any given year.

Twenty-five percent of industry respondents believed program cuts were enacted in response to budget problems, and another 20% believed some programs had experienced delays. As VA's IS plans become more grandiose during modernization, it will be interesting to see if these plans will be subjected to more-intense congressional examination.

EXHIBIT VII-8

Vendor Views of the Impact of Budget Constraints on VA IS Acquisitions

Impact	Percent of Respondents
None/Minimal	55
Program Cuts	25
Program Delays	20

Although the federal government mandated that federal agencies must develop or purchase only OSI-compliant systems, over half of the responses given by vendors indicated that standards have had little or no impact on VA IS acquisitions. As shown in Exhibit VII-9, the agency is striving to develop standards compliance, but vendors have seen little evidence of these efforts in procurements of products or services. In a few years, vendors may have a different perception of VA standards compliance as department modernization efforts grow.

EXHIBIT VII-9

Standards Activities Impacting VA's Acquisitions of IS

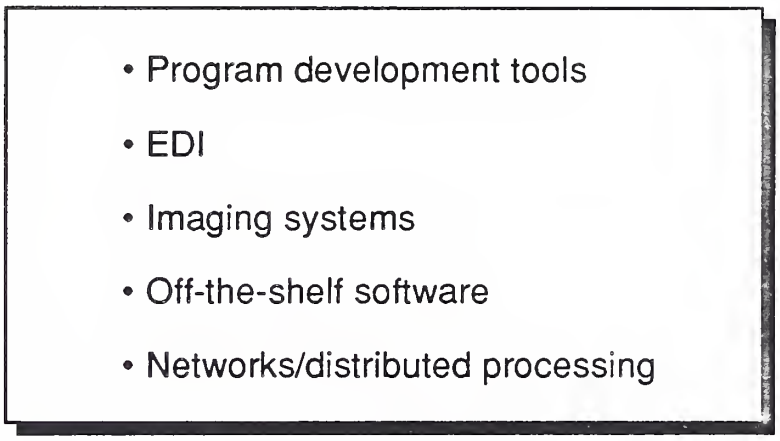
Activities	Percent of Responses*
None/Little	54
Standardized Software	21
GOSIP	17
POSIX	13
SQL	4

*Will not add to 100%; multiple responses were allowed.

Specific standards mentioned by vendors were limited to GOSIP, POSIX, and SQL. SQL use or dependence is expected to increase significantly as new systems are developed using relational data bases. VA has recently mandated SQL as a department standard. New technologies that vendors predict will change VA information processing during the next five years are listed in Exhibit VII-10. Program development technology (such as case tools) and other procedural languages that speed software development will be widely used throughout VA to upgrade aging systems and develop new applications.

EXHIBIT VII-10

Vendor Perceptions of New Technologies That Will Impact VA Information Processing, FY 1991 - FY 1996



Note: 29% of the respondents did not specify technologies.

Vendors believe the use of EDI in purchasing functions will speed medical supply purchases and payments between contractors and the department.

The role of image systems will not be limited to simple text document storage and retrieval, but will be extended to capture vital medical records such as X-rays. Imaging technology should also play a vital role in expediting the delivery of veterans' benefits.

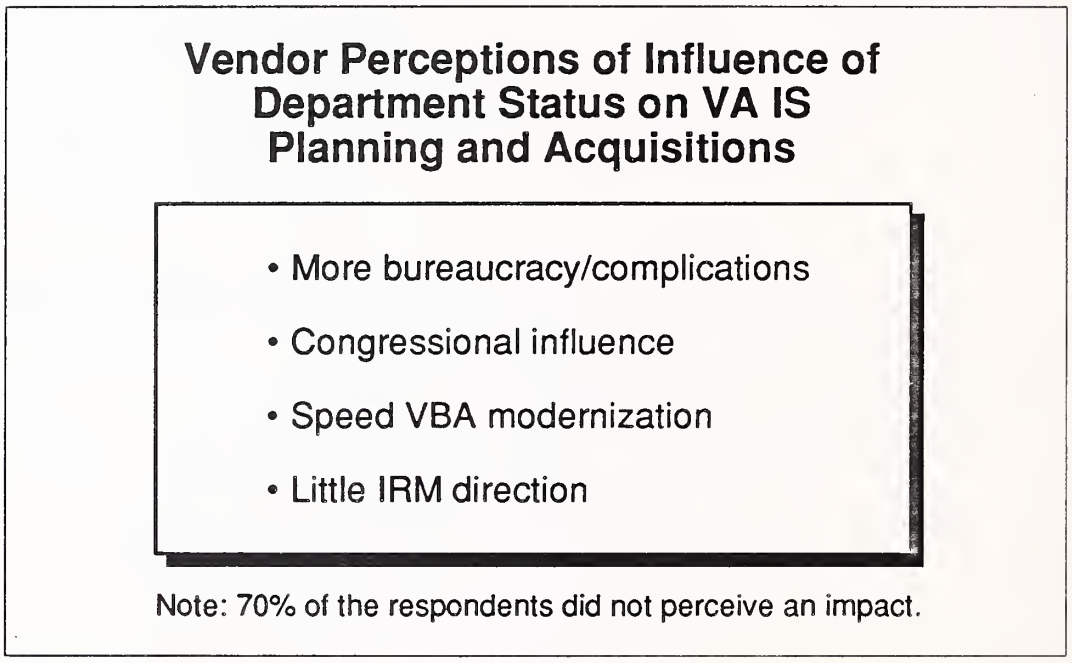
Increased availability of user-friendly, off-the-shelf software will aid in shaping a more automated office environment through all VA facilities and will create computer-literate users.

Distributed processing capabilities in the Veterans Benefits Administration and the Veterans Health Services and Research Administration are made possible by personal computers and the ability to configure PCs in

LAN and WAN networks. Successful implementation extends computer use to end users while improving overall data-processing efficiency.

Vendor respondents were asked if they believed VA's recent elevation to cabinet-level status has affected the planning or acquisition of information systems and services. Respondents' perceptions are presented in Exhibit VII-11. Contrary to INPUT's expectations, almost three-quarters did not notice changes. Some respondents also noted that VA personnel have remained the same, despite the organizational changes.

EXHIBIT VII-11



One of the changes observed was that more bureaucratic red tape was now associated with procurements. Additional bureaucracy produces more complications in the already-cumbersome procurement process.

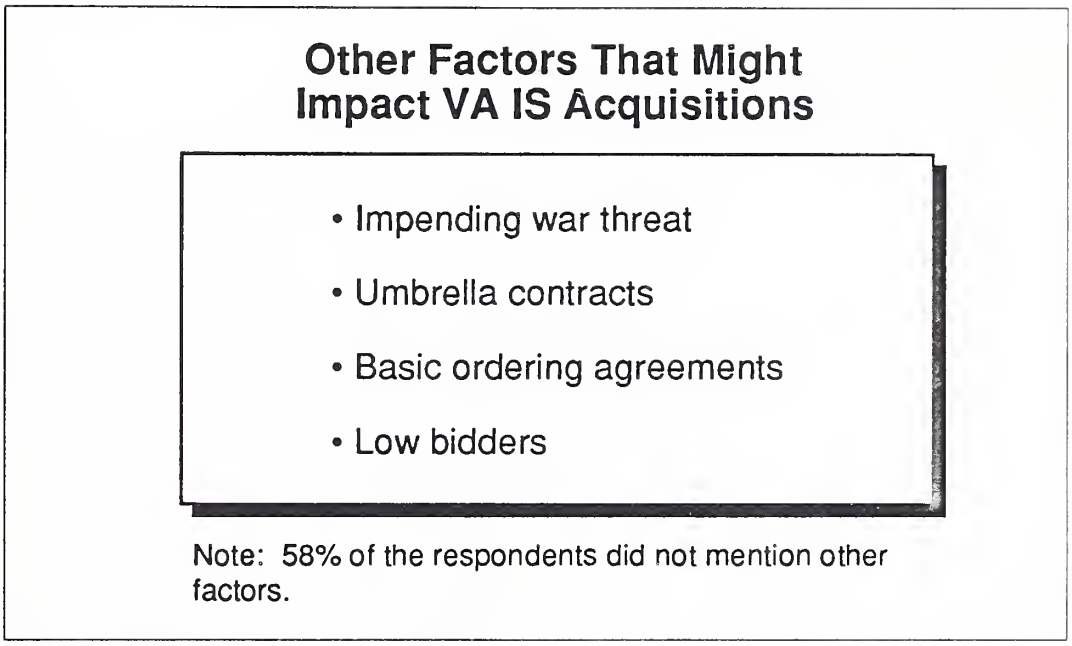
Other respondents noted that department status confers more political influence in Congress, and makes VA the recipient of more congressional attention, especially when large amounts of funding are required. Specifically, VBA modernization plans are believed to have been accelerated because of department status.

Although VA has been trying to develop and provide more IRM direction and control since department status was announced, some vendors believe little progress has been made. Information processing is almost entirely performed autonomously by the major operating VA elements; coordinated planning is minimal. The recent reassignment of management responsibility for three data processing centers from the Office of Information Resources Operations (OIRO) to VBA and the Office of Finance and Planning appears to promote decentralization directions

within the department. However, the pendulum has a way of swinging back and forth, depending on current executive preference.

Vendors were also asked to indicate other factors they thought would impact VA IS acquisitions over the next five years. Although 58% did not mention additional factors, the factors mentioned are listed in Exhibit VII-12.

EXHIBIT VI-12



Industry and VA interviews were conducted during the beginning of the Iraq/Persian Gulf crisis. It was not surprising that vendors mentioned the war threat as a factor that could change VA's IS acquisition strategies. To meet demands by larger numbers of veterans and their families, VA would have to move very quickly to improve systems that provide services.

The increased use of umbrella contracts was viewed as causing VA offices to redefine their requirements in broader terms. Specific IS requirements are often sacrificed to speed the procurement process when agencies or departments are required to purchase from standard departmentwide or multiagency contracts.

Basic ordering agreements (BOAs) make the acquisition process easier for agencies and for vendors fortunate enough to have BOAs. VA has several BOAs in place. If VA increases its use of BOAs, time-consuming procurements will be avoided. IS needs can be implemented more expeditiously. Frequently, VA establishes competitive BOAs and competes task orders among several vendors.

One phenomenon that continues to occur within the federal IS sector is underbidding by vendors to gain entry into an agency. VA is known to

select the lowest bidder in competitive situations. Vendors expressed concern that underbidding to obtain entry may be occurring within VA. The agency may sacrifice better technical solutions to keep costs low. Once a vendor gains market presence within an agency, an associated commitment to that vendor's products lasts many years. While VA modernizes its IS functions, vendors believe that the department must be careful not to preclude better information processing solutions because of contract awards on the basis of lowest price. Agency efficiency and fulfillment of mission directives could also be threatened.

F

Marketing Differences

One-third of the vendors in this study did not see any differences in marketing to this agency, or any unique problems associated with winning contracts at VA. Differences mentioned are listed in Exhibit VII-13.

Some vendors believe VA's culture is somewhat different from the culture of other agencies because of the medical orientation of VA's administrative services. Applications tend to be unique to VA, and generally do not have applicability to other agencies (except for DoD medical departments) or to commercial markets.

EXHIBIT VII-13

Differences in Marketing to VA

- Agency culture
- Technology literate
- Decentralized market
- Low bids win

Note: 33% of the respondents did not perceive any differences.

Some industry respondents view VA's IS technical personnel as more computer literate than other agencies'. This literacy can have positive or negative implications for vendors. Working with agency personnel who are technically knowledgeable can mean harder or easier sales of products and services. The ability to perform in-house programming functions means less dependence on contractors to provide professional services. However, vendors that stress solutions with the latest technology may have a competitive edge.

Vendors complained that they must market their products and services nationwide to hospitals and offices because of VA's decentralized organization. As a result, marketing efforts, are not always consistently delivered and create additional costs.

VA's preference for selecting low bidders was also voiced as one of the differences in marketing to the agency. Other agencies exhibit more flexibility in bids.

G

Suggested Improvements to Products and Services

When asked what vendors could do to improve their IS products and services to VA, only two suggestions were dominant, as shown in Exhibit VII-14.

EXHIBIT VII-14

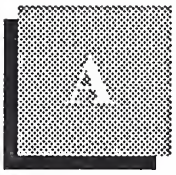
Suggested Improvements to Products and Services*

- Improve price/performance
- Assure product compatibility/ interoperability

Note: 42% of the respondents did not make suggestions.

Improvement of price and product performance was noted most frequently by vendors. Vendors believe that additional sales accompany better price/performance ratios.

Product compatibility and interoperability with other vendors' products are critical to VA as the department strives to interconnect IS resources. Vendors must respond to agency demands for OSI-compatible products or must sacrifice sales. On the other hand, producing OSI-compatible products can strip product-unique features and produce virtually identical IS products. OSI compatibility may cause a further vendor shakeout in the federal market and may further this agency's reliance on low bids.



Department of Veterans Affairs Information Systems Market Interview Profiles

A

VA Respondent Interviews

Sixty-five percent of VA interviewees were policy-level personnel, and 35% were program managers. Both respondent groups were composed of representatives of the three organizational elements within the department (VBA, VHS&RA, and NCS), the Office of Information Resources Management, and the Office of Finance and Planning.

Interviews were conducted primarily via telephone. In addition, numerous on-site interviews were conducted with senior department officials and representatives of the Office of Information Resources Management.

B

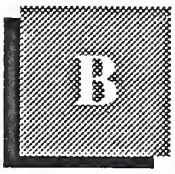
Industry Interviews

For this report, INPUT contacted a representative sample of vendors that were currently under contract with VA or had strategic marketing efforts in place to win contracts. Vendors and contractors of hardware, software, telecommunications, and professional and systems integration services were interviewed.

Job classifications of industry respondents were:

- Marketing executives
- Account managers
- Corporate executives

Vendor interviews were conducted entirely by telephone.



Definitions

The definitions in this appendix include hardware, software, services, and telecommunications categories to accommodate the range of information systems and services programs described in this report.

Alternate service mode terminology employed by the federal government in its procurement process is defined along with INPUT's regular terms of reference, as shown in Exhibit B-1.

The federal government's unique nontechnical terminology that is associated with applications, documentation, budgets, authorization, and the procurement/acquisition process is included in Appendix C, Glossary of Acronyms.

A
Delivery Modes

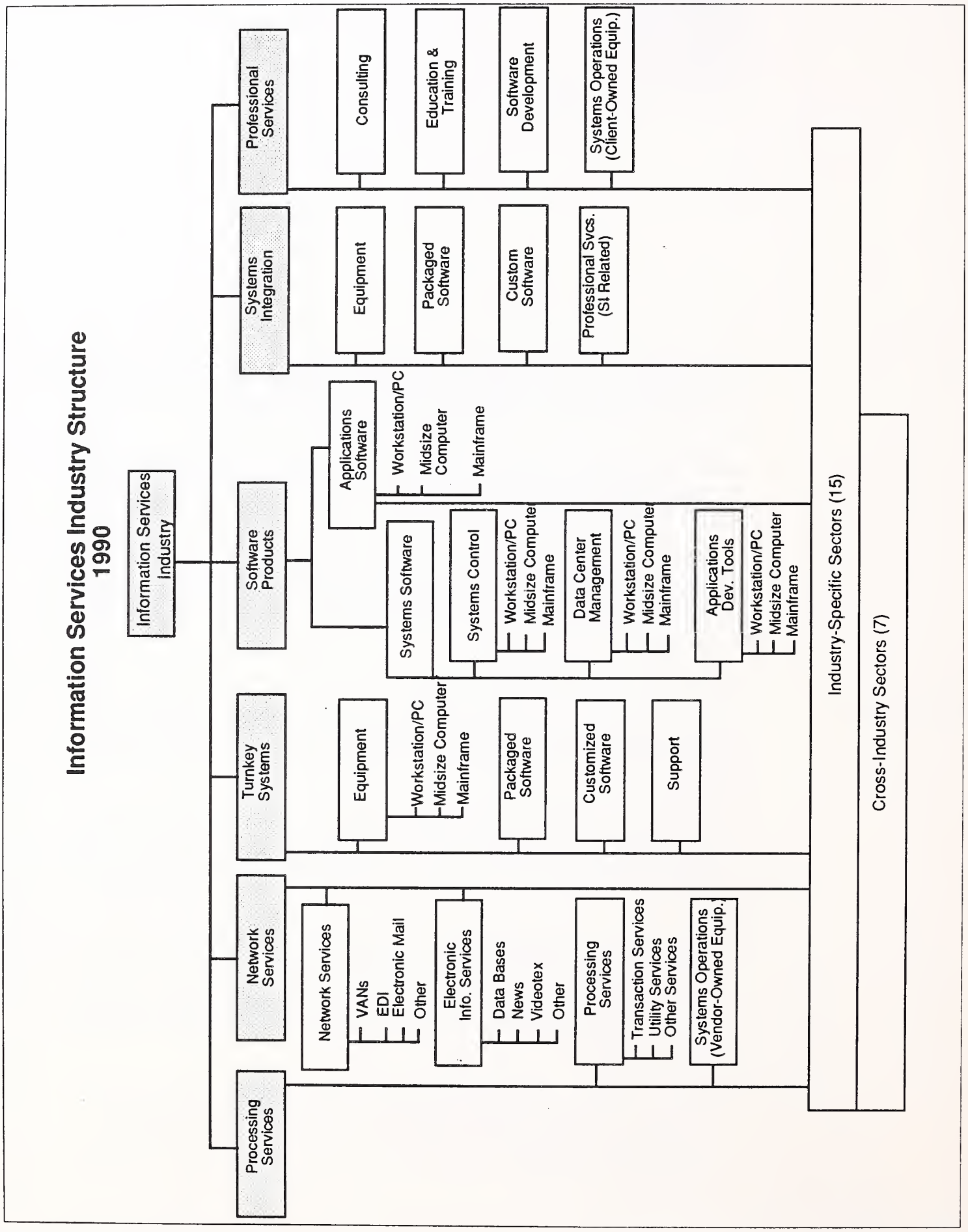
Processing services - This category includes transaction processing, utility processing, other processing services, and processing facilities management.

- *Transaction Processing Services* - Updates client-owned data files by entry of specific business activity, such as sales order, inventory receipt, cash disbursement, etc. Transactions may be entered in one of three modes.

  - *Interactive* - Characterized by the interaction of the user with the system, primarily for problem-solving timesharing, but also for data entry and transaction processing; the user is on-line to the program files. Computer response is usually measured in seconds or fractions of a second.

  - *Remote Batch* - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements. Computer response is measured in minutes or hours.

EXHIBIT B-1



- *User Site Hardware Services (USHS)* - Those offerings provided by processing services vendors that place programmable hardware at the user's site rather than at the vendor's data center. Some vendors in the federal government market provide this service under the label of distributed data services. USHS offers:

  ° Access to a communications network

  ° Access through the network to the RCS vendor's larger computers

  ° Local management and storage of a data base subset that will service local terminal users via the connection of a data base processor to the network

  ° Significant software as part of the service

- *Utility Processing* - Vendor provides access to basic software tools enabling the users to develop their own problem solutions such as language compilers assemblers, DBMS, sorts scientific library routines, and other systems software.

"Other" Processing Services include:

- *Batch Services* - These include data processing at vendors' sites for user programs and/or data that are physically transported (as opposed to transported electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and computer output microfilm processing, are also included. Batch services include expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing. Other services also includes disaster recovery and backup services.

- *Systems Operations (Processing)* - Also referred to as "Resource Management," Facilities Management or "COCO" (contractor-owned, contractor-operated). Systems control is the management of all or part of a user's data processing functions under a long-term contract of not less than one year. This would include remote computing and batch services. To qualify, the contractor must directly plan, control, operate, and own the facility provided to the user–either on-site, through communications lines, or in a mixed mode.

Processing services are further differentiated as follows:

- *Cross-industry* services involve the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but that cut across industry lines. Most general-ledger, accounts receivable, payroll, and personnel applications fall into this category.

Cross-industry data base services, for which the vendor supplies the data base and controls access to it (although it may be owned by a third party), are included in this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific (see below).

- *Industry-specific* services provide processing for particular functions or problems unique to an industry or industry group. Specialty applications can be either business or scientific in orientation. Industry-specific data base services, for which the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry-specific applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

Network Services include a wide variety of network-based functions and operations. The common thread is that more of these functions could be performed without network involvement. Network services is divided into two segments: value-added networks (enhanced services), and network applications (electronic information systems).

- *Value-Added Networks (VANs)* - VANs typically involve common carrier network transmission facilities that are augmented with computerized switches. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and TYMNET) employ packet-switching techniques. However, other added data service features such as store-and-forward message switching, terminal interfacing, error detection and correction, and host computer interfacing are of equal importance.

- *Network applications* include electronic data interchange (EDI), the application-to-application electronic communications between organizations, based on established business document standards and electronic mail.

Software products - This category includes user purchases of applications and systems software packages for in-house computer systems. Included are lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Expenditures for work performed by organizations other than the package vendor are counted in the category of professional services. Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself. There are several subcategories of software products, as indicated below and shown in detail in Exhibit B-2.

EXHIBIT B-2

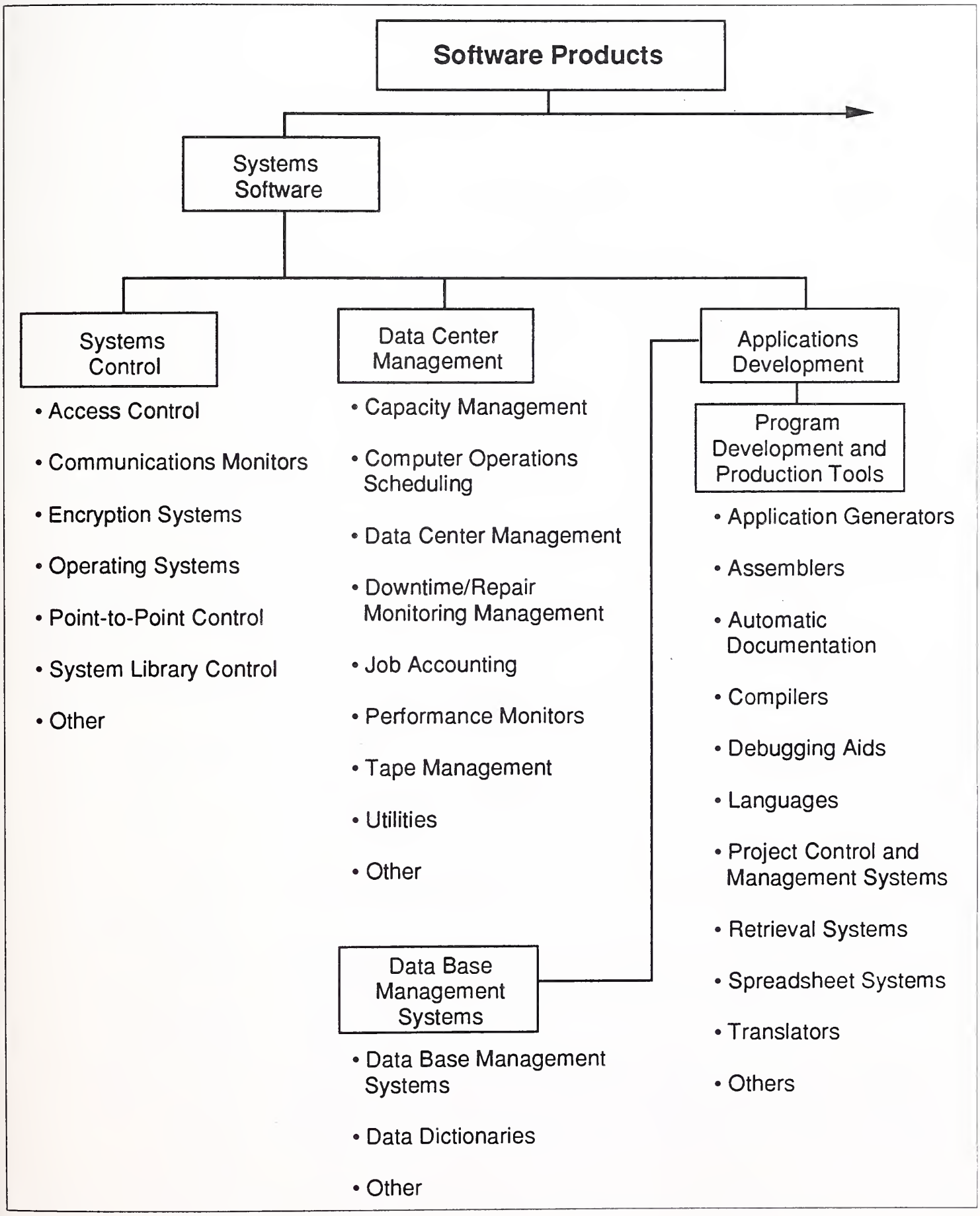
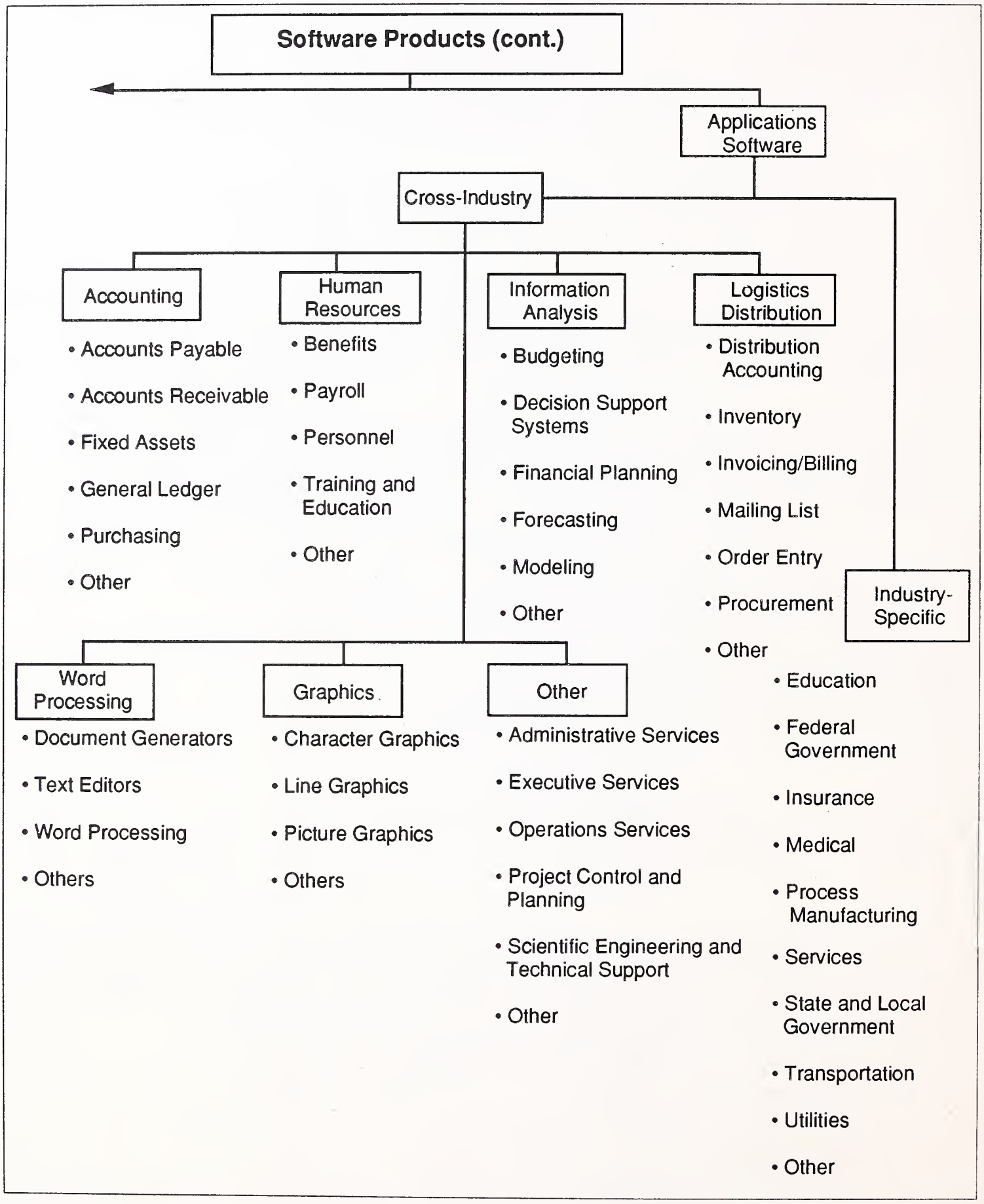


EXHIBIT B-2 (Cont.)



- *Applications Products* - Software that performs functions directly related to solving user's business or organizational need. The products can be:

  - *Cross-Industry Products* - Used in multiple-industry applications as well as the federal government sector. Examples are payroll, inventory control, and financial planning.

  - *Industry-Specific Products* - Used in a specific industry sector, such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting, airline scheduling, and material resource planning.

- *Systems Software Products* - Software that enables the computer/communications system to perform basic functions. These products include:

  - *System Control Products* - Function during applications program execution to manage the computer system resources. Examples include operating systems, communication monitors, emulators, spoolers, network control, library control, windowing, access control.

  - *Data Center Management Products* - Used by operations personnel to manage the computer systems resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, utilities, capacity management.

  - *Applications Development Products* - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include traditional programming languages, 4GLs, sorts, productivity aids, assemblers, compilers, data dictionaries, data base management systems, report writers, project control, and CASE systems.

Professional Services - This category includes consulting, education and training, software development, and systems operations as defined below.

- *Software development* - Develops a software system on a custom basis. It includes one or more of the following: user requirements definition, system design, contract programming, documentation, and software maintenance.

- *Education and Training* - Products and/or services related to information systems and services for the user, including computer-aided instruction (CAI), computer-based education (CBE), and vendor instruction of user personnel in operations, programming, and maintenance.

- *Consulting Services* - Information systems and/or services management consulting, project assistance (technical and/or management), feasibility analyses, and cost-effectiveness trade-off studies.

- *Systems Operations (Professional Services)* - This is a counterpart to systems operations (processing services) except the computing equipment is owned or leased by the client, not by the vendor. The vendor provides the staff to operate, maintain, and manage the client's facility.

Turnkey Systems - A turnkey system is an integration of systems and applications software with CPU hardware and peripherals, packaged as a single application (or set of applications) solution. The value added by the vendor is primarily in the software and support. Most CAD/CAM systems and many small-business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, or process control systems, nor does it include Embedded Computer Resources for military applications. Turnkey systems may be either custom or packaged systems.

- Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

- Turnkey systems revenue is divided into two categories:

  - *Industry-specific systems* - that is, systems that serve a specific function for a given industry sector such as automobile dealer parts inventory, CAD/CAM systems, or discrete manufacturing control systems.

  - *Cross-industry systems* - that is, systems that provide a specific function that is applicable to a wide range of industry sectors such as financial planning systems, payroll systems, or personnel management systems.

- Revenue includes hardware, software, and support functions.

Systems Integration: (SI) delivery of large, complex multidisciplinary, multivendor systems, incorporating some or all of these categories: systems design, programming, integration, equipment, packaged software, communication networks, installation education and training, and SI-related professional services and acceptance. Systems integration contracts typically take more than a year to complete and involve a prime contractor assuming risk and accepting full responsibility.

B

Hardware/Hardware Systems

Hardware - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system.

- *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be connected locally to the main processor, and generally cannot be included in other categories such as terminals.

- *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.

- *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters.

- *Communication Devices* - Includes modems, encryption equipment, special interfaces, and error control.

- *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories.

Terminals - Three types of terminals are described below:

- *User-Programmable* - Also called intelligent terminals, including:

  - Single-station or standalone
  - Multistation shared processor
  - Teleprinter
  - Remote batch

- *User Nonprogrammable*

  - Single-station
  - Multistation shared processor
  - Teleprinter

- *Limited Function* - Originally developed for specific needs, such as point-of-sale (POS), inventory data collection, controlled access, and other applications.

Hardware Systems - Includes all processors from microcomputers to supercomputers. Hardware systems may require type- or model-unique

operating software to be functional, but this category excludes applications software and peripheral devices, other than main memory and processors or CPUs not provided as part of an integrated (turnkey) system.

- *Microcomputer* - Combines all of the CPU, memory, and peripheral functions of an 8-, 16-, or 32-bit computer on a chip in the form of:

  - Integrated circuit package
  - Plug-in boards with more memory and peripheral circuits
  - Console including keyboard and interfacing connectors
  - Personal computer with at least one external storage device directly addressable by the CPU
  - An embedded computer which may take a number of shapes or configurations

  Microcomputers are primarily single-user computers that cost under $15,000.

- *Midsize Computer* - Typically a 32- or 64-bit computer with extensive applications software and a number of peripherals in standalone or multiple-CPU configurations for business (administrative, personnel, and logistics) applications; also called a general-purpose computer. Specific systems in this category are: IBM 93XX systems, all Digital VAX series systems, and such common UNIX-based systems as from Apollo and Sun) are also included. Most large shared-logic, integrated office systems—such as those from Wang, Hewlett-Packard, and Groupe Bull—would also be considered midsize systems. Does not include microcomputers (standalone, or shared), embedded systems, and CAD/CAM systems.

- *Large Computer* - Presently centered around storage controllers but likely to become bus-oriented and to consist of multiple processors or parallel processors. Intended for structured mathematical and signal processing and typically used with general-purpose, VonNeumann-type processors for system control. Usually refers to traditional mainframes (such as IBM 30XX, Unisys (Sperry) 1100/XX, Honeywell DDPS88, Unisys (Burroughs) A15, or CDC Cyber series) and supercomputers (such as products from Cray, ETA, Fujitsu, and the new IBM development effort).

- *Supercomputer* - High-powered processors with numerical processing throughput that is significantly greater than the fastest general-purpose computers, with capacities in the 100-500 million floating point opera-

tions per second (MFLOPS) range. Newer supercomputers, with burst modes over 500 MFLOPS, main storage size up to 10 million words, and on-line storage in the one-to-three gigabyte class, are labeled Class IV to Class VII in agency long-range plans. Supercomputers fit in one of two categories:

- *Real Time* - Generally used for signal processing in military applications.

- *Non-Real Time* - For scientific use in one of three configurations:

  ° Parallel processors
  ° Pipeline processor
  ° Vector processor

- *Supercomputer* - Term applied to micro, mini, and large mainframe computers with performance substantially higher than attainable by VonNeuman architectures.

- *Embedded Computer* - Dedicated computer system designed and implemented as an integral part of a weapon, weapon system, or platform; critical to a military or intelligence mission such as command and control, cryptological activities, or intelligence activities. Characterized by military specifications (MIL SPEC) appearance and operation, limited but reprogrammable applications software, and permanent or semi-permanent interfaces. May vary in capacity from microcomputers to parallel processors computer systems.

C
Telecommunications

Networks - Electronic interconnection between sites or locations that may incorporate links between central computer sites and remote locations and switching and/or regional data processing nodes. Network services typically are provided on a leased basis by a vendor to move data, voice, video, or textual information between locations. Networks can be categorized in several different ways.

- *Common Carrier Network* - A public access network, such as provided by AT&T, consisting of conventional voice-grade circuits and regular switching facilities accessed through dial-up calling with leased or user-owned modems for transfer rates between 150 and 1200 baud.

- *Value-Added Network (VAN)* - (See listing under Section B, Delivery Modes.)

- *Local-Area Network (LAN)* - Limited-access network between computing resources in a relatively small (but not necessarily contiguous) area, such as a building, complex of buildings, or buildings distributed within a metropolitan area. Uses one of two signaling methods:

- *Baseband* - Signaling using digital waveforms on a single frequency band, usually at voice frequencies and bandwidth, and limited to a single sender at any given moment. When used for local-area networks, typically implemented with TDM to permit multiple access.

- *Broadband* - Transmission facilities that use frequencies greater than normal voice-grade, supported in local-area networks with RF modems and AC signaling. Also known as wideband. Employs multiplexing techniques that increase carrier frequency between terminals to provide:

  ° Multiple (simultaneous) channels via FDM (Frequency Division Multiplexing)

  ° Multiple (time-sequenced) channels via TDM (Time Division Multiplexing)

  ° High-speed data transfer rate via parallel mode at rates of up to 96,000 baud (or higher, depending on media)

• *Wide-Area Network (WAN)* - Limited access network between computing resources in buildings, complexes of buildings, or buildings within a large metropolitan or wide geographical area. Uses baseband or broadband signaling methods.

Transmission Facilities - Includes wire, carrier, coaxial cable, microwave, optical fiber, satellites, cellular radio, and marine cable operating in one of two modes depending on the vendor and the distribution of the network.

• *Mode* - may be either:

- *Analog* - Transmission or signal with continuous-waveform representation, typified by AT&T's predominantly voice-grade DDD network and most telephone operating company distribution systems.

- *Digital* - Transmission or signal using discontinuous, discrete quantities to represent data, which may be voice, data, record, video, or text, in binary form.

• *Media* - May be any of the following:

- *Wire* - Varies from earlier single-line teletype networks, to two-wire standard telephone (twisted pair), to four-wire full-duplex balanced lines.

- *Carrier* - A wave, pulse train, or other signal suitable for modulation by an information-bearing signal to be transmitted over a communi-

cations system, used in multiplexing applications to increase network capacity.

- *Coaxial Cable* - A cable used in HF (high-frequency) and VHF (very high frequency), single-frequency, or carrier-based systems; requires frequent reamplification (repeaters) to carry the signal any distance.

- *Microwave* - UHF (ultra-high-frequency) multichannel, point-to-point, repeated radio transmission, also capable of wide frequency channels.

- *Optical Fiber* - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers and TDM for multichannel applications.

- *Communications Satellites* - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but requiring suitable groundstation facilities for up- and down-link operation.

- *Cellular Radio* - Network of fixed, low-powered two-way radios that are linked by a computer system to track mobile phone/data set units. Each radio serves a small area called a cell. The computer switches service connections to the mobile unit from cell to cell.

D

General Definitions

103/113 - Bell standard modem for low-speed transmission up to 300 bps, asynchronous, half or full duplex.

212 - Bell standard for medium-speed transmission at 1200 bps, asynchronous or synchronous, half or full duplex.

ASCII - American National Standards Code for Information Interchange—eight-bit code with seven data bits and one parity bit.

Asynchronous - Communications operation (such as transmission) without continuous timing signals. Synchronization is accomplished by appending signal elements to the data.

Bandwidth - Range of transmission frequencies that can be carried on a communications path; used as a measure of capacity.

Baud - Number of signal events (discrete conditions) per second. Typically used to measure modem or terminal transmission speed.

Benchmark - Method of testing proposed ADP system solutions for a specified set of functions (applications) employing simulated or real data inputs under simulated operating conditions.

BPS - Bits per second - also mbps and kbps, million bits per second and thousand bits per second, respectively.

BSC - IBM's binary synchronous communications data link protocol. First introduced in 1968 for use on point-to-point and multipoint communications channels. Frequently referenced as "bisync."

Byte - Usually equivalent to the storage required for one alphanumeric character (i.e., one letter or number).

CBX - Computerized Branch Exchange - a PABX based on a computer system, implying programmability and usually voice and data capabilities.

Central Processing Unit (CPU) - The arithmetic and control portion of a computer; i.e., the circuits controlling the interpretation and execution of computer instructions.

Centrex - Central office telephone services that permit local circuit switching without installation of customer premises equipment. Could be described as shared PBX service.

Circuit Switching - A process that, usually on demand, connects two or more network stations and permits exclusive circuit use until the connection is released; typical of the voice telephone network where a circuit is established between the caller and the called party.

CO - Central Office - local telco site for one or more exchanges.

CODEC - Coder/decoder, equivalent to modem for digital devices.

Constant Dollars - Growth forecasts in constant dollars make no allowance for inflation or recession. Dollar value based on the year of the forecast unless otherwise indicated.

Computer System - The combination of computing resources required to perform the designed functions and which may include one or more CPUs, machine room peripherals, storage systems, and/or applications software.

CPE - Customer Premises Equipment - DCE or DTE located at a customer site rather than at a carrier site such as the local telephone company CO. May include switchboards, PBX, data terminals, and telephone answering devices.

CSMA/CD - Carrier Sense Multiple Access/Collision Detect. Contention protocol used in local-area networks, typically with a multi-point configuration.

Current Dollars - Estimates or values expressed in current-year dollars which, for forecasts, would include an allowance for inflation.

Data Encryption Standard (DES) - 56-bit key, one-way encryption algorithm adopted by NBS in 1977, implemented through hardware ("S-boxes") or software. Designed by IBM with NSA guidance.

Datagram - A self-contained packet of information with a finite length that does not depend on the contents of preceding or following packets.

DCA - IBM's Document Content Architecture - protocols for specifying document (text) format which are consistent across a variety of hardware and software systems within IBM's DISOSS.

DCE - Data Circuit-Terminating Equipment - interface hardware that couples DTE to a transmission circuit or channel by providing functions to establish, maintain, and terminate a connection, including signal conversion and coding.

DDCMP - Digital Data Communications Message Protocol - data link protocol used in Digital Equipment Corporation's DECNET.

DECNET - Digital Equipment Corporation's network architecture.

Dedicated Circuit - A permanently established network connection between two or more stations; contrast with switched circuit.

DEMS - Digital Electronic Message Service - nationwide common carrier digital networks which provide high-speed, end-to-end, two-way transmission of digitally-encoded information using the 10.6 GHz band.

DIA - IBM's Document Interchange Architecture - protocols for transfer of documents (text) between different hardware and software systems within IBM's DISOSS.

DISOSS - IBM's DIStributed Office Support System - office automation environment, based on DCA and DIA, which permits document (text) transfer between different hardware and software systems without requiring subsequent format or content revision.

Distributed Data Processing - The development of programmable intelligence in order to perform a data processing function where it can be accomplished most effectively through computers and terminals arranged in a telecommunications network adapted to the user's characteristics.

DTE - Data Terminal Equipment - hardware which is a data source or link or both, such as video display terminals that convert user information into data for transmission and reconvert data signals into user information.

EBCDIC - Extended Binary Coded Decimal Interchange Code - eight-bit code typically used in IBM mainframe environments.

EFT - Electronic funds transfer.

Encryption - Electrical, code-based conversion of transmitted data to provide security and/or privacy of data between authorized access points.

End User - One who is using a product or service to accomplish his or her own functions. The end user may buy a system from the hardware supplier(s) and do his or her own programming, interfacing, and installation. Alternately, the end user may buy a turnkey system from a systems house or hardware integrator, or may buy a service from an in-house department or external vendor.

Engineering Change Notice (ECN) - Product changes to improve the product after it has been released to production.

Engineering Change Order (ECO) - The follow-up to ECNs—they include parts and a bill of materials to effect the change in the hardware.

Equipment Operators - Individuals operating computer control consoles and/or peripheral equipment (BLS definition).

Ethernet - Local-area network developed by Xerox PARC using baseband signaling, CSMA/CD protocol, and coaxial cable to achieve a 10 mbps data rate.

Facsimile - Transmission and reception of data in graphic form, usually fixed images of documents, through scanning and conversion of a picture signal.

FDM - Frequency Division Multiplexing - a multiplexing method that permits multiple access by assigning different frequencies of the available bandwidth to different channels.

FEP - Front-End Processor - communications concentrator such as the IBM 3725 or COMTEN 3690 used to interface communications lines to host computers.

Field Engineer (FE) - Field engineer, customer engineer, serviceperson, and maintenance person are used interchangeably and refer to the individual who responds to a user's service call to repair a device or system.

Full-Duplex - Bi-directional communications with simultaneous two-way transmission.

General-Purpose Computer System - A computer designed to handle a wide variety of problems. Includes machine room peripherals, systems software, and small business systems.

Half-Duplex - Bi-directional communications, but only in one direction at a time.

Hardware Integrator - Develops system interface electronics and controllers for the CPU, sensors, peripherals, and all other ancillary hardware components. The hardware integrator also may develop control system software in addition to installing the entire system at the end-user site.

HDLC - High-Level Data Link Control.

Hertz - Number of signal oscillations (cycles) per second - abbreviated Hz.

IBM Token Ring - IBM's local-area network using baseband signalling and operating at 4 mbps on twisted-pair copper wire. Actually a combination of star and ring topologies – IEEE 802.5-compatible.

IDN - Integrated Digital Network - digital switching and transmission; part of the evolution to ISDN.

Independent Suppliers - Suppliers of machine room peripherals - usually do not supply general purpose computer systems.

Information Processing - Data processing as a whole, including use of business and scientific computers.

Installed Base - Cumulative number or value (cost when new) of computers in use.

Interconnection - Physical linkage between devices on a network.

Interoperability - The capability to operate with other devices on a network. To be contrasted with interconnection, which merely guarantees a physical network interface.

ISDN - Integrated Services Digital Network - integrated voice and non-voice public network service which is completely digital. Not clearly defined through any existing standards although FCC and other federal agencies are participating in the development of CCITT recommendations.

Keypunch Operators - Individuals operating keypunch machines (similar in operation to electric typewriters) to transcribe data from source materials onto punch cards.

Lease Line - Permanent connection between two network stations. Also known as dedicated or non-switched line.

Machine Repairers - Individuals who install and periodically service computer systems.

Machine Room Peripherals - Peripheral equipment that is generally located close to the central processing unit.

Mainframe - The central processing unit (CPU or units in a parallel processor) of a computer that interprets and executes computer (software) instructions of 32 bits or more. Usually refers to traditional mainframes (such as IBM 30XX, Unisys (Sperry) 1100/XX, Honeywell DDPS88, Unisys (Burroughs) A15, or CDC (Cyber series).

MAP - Manufacturing Automation Protocol - seven-layer communications standard for factory environments promoted by General Motors/ EDS. Adopts IEEE 802.2 and IEEE 802.4 standards plus OSI protocols for other layers of the architecture.

Mean Time to Repair - The mean of elapsed times from the arrival of the field engineer on the user's site until the device is repaired and returned to user service.

Mean Time to Respond - The mean of elapsed times from the user call for services and the arrival of the field engineer on the user's site.

Message - A communication intended to be read by a person. The quality of the received document need not be high, only readable. Graphic materials are not included.

MMFS - Manufacturing Messaging Format Standard - application-level protocol included within MAP.

Modem - A device that encodes information into electronically transmittable form (MOdulator) and restores it to original analog form (DEModulator).

NCP - Network Control Program - software used in IBM 3705/3725 FEPs for control of SNA networks.

Node - Connection point of three or more independent transmission points which may provide switching or data collection.

Off-Line - Pertaining to equipment or devices that can function without direct control of the central processing unit.

On-Line - Pertaining to equipment or devices under direct control of the central processing unit.

OSI - ISO reference model for Open Systems Interconnection - seven-layer architecture for application, presentation, session, transport, network, data link, and physical services and equipment.

OSI Application Layer - Layer 7, providing end-user applications services for data processing.

OSI Data Link Layer - Layer 2, providing transmission protocols, including frame management, link flow control, and link initiation/release.

OSI Network Layer - Layer 3, providing call establishment and clearing control through the network nodes.

OSI Physical Layer - Layer 1, providing the mechanical, electrical, functional, and procedural characteristics to establish, maintain, and release physical connections to the network.

OSI Presentation Layer - Layer 6, providing data formats and information such as data translation, data encoding/decoding, and command translation.

OSI Session Layer - Layer 5, establishes, maintains, and terminates logical connections for the transfer of data between processes.

OSI Transport Layer - Layer 4, providing end-to-end terminal control signals such as acknowledgements.

Overseas - Not within the geographical limits of the continental United States, Alaska, Hawaii, and U.S. possessions.

PABX - Private Automated Branch Exchange - hardware that provides automatic (electromechanical or electronic) local circuit switching on a customer's premises.

PAD - Packet Assembler-Disassembler - a device that enables DTE not equipped for packet switching operation to operate on a packet-switched network.

PBX - Private Branch Exchange - hardware which provides local circuit switching on the customer premise.

PCM - Pulse-Code Modulation - modulation involving conversion of a waveform from analog to digital form through coding.

PDN - Public Data Network - a network established and operated by a recognized private operating agency, a telecommunications administration, or other agency for the specific purpose of providing data transmission services to the public.

Peripherals - Any unit of input/output equipment in a computer system, exclusive of the central processing unit.

PPM - Pulse Position Modulation.

Private Network - A network established and operated for one user or user organization.

Programmers - Persons mainly involved in designing, writing, and testing of computer software programs.

Protocols - The rules for communication system operation that must be followed if communication is to be effected. Protocols may govern portions of a network or service. In digital networks, protocols are digitally encoded as instructions to computerized equipment.

Public Network - A network established and operated for more than one user with shared access, usually available on a subscription basis. See related international definition of PDN.

Scientific Computer System - A computer system designed to process structured mathematics, such as Fast Fourier Transforms, and complex, highly redundant information, such as seismic data, sonar data, and radar, with large on-line memories and very high capacity throughput.

SDLC - Synchronous Data Link Control - IBM's data link control for SNA. Supports a subset of HDLC modes.

SDN - Software-Defined Network.

Security - Physical, electrical, and computer (digital) coding procedures to protect the contents of computer files and data transmission from inadvertent or unauthorized disclosure to meet the requirements of the Privacy Act and national classified information regulations.

Service Delivery Point - The location of the physical interface between a network and customer/user equipment.

Simplex - Undirectional communications.

Smart Box - A device for adapting existing DTE to new network standards such as OSI. Includes PADs and protocol convertors, for example.

SNA - Systems Network Architecture - seven-layer communications architecture designed by IBM. Layers correspond roughly but not exactly to OSI model.

Software - Computer programs.

Supplies - Includes materials associated with the use or operations of computer systems, such as printer paper, keypunch cards, disk packs, and tapes.

Switched Circuit - Temporary connection between two network stations established through dial-up procedures.

Synchronous - Communications operation with separate, continuous clocking at both sending and receiving stations.

Systems Analyst - Individual who analyzes problems to be converted to a programmable form for application to computer systems.

Systems House - Vendor that acquires, assembles, and integrates hardware and software into a total system to satisfy the data processing requirements of an end user. The vendor also may develop systems software products for license to end users. The systems house vendor does not manufacture mainframes.

Systems Integrator - Systems house vendor that develops systems interface electronics, applications software, and controllers for the CPU, peripherals, and ancillary subsystems that may have been provided by a contractor or the government (GFE). This vendor may either supervise or perform the installation and testing of the completed system.

TI - Bell System designation for 1.544 mbps carrier capable of handling 24 PCM voice channels.

TDM - Time Division Multiplexing - a multiplexing method that interweaves multiple transmissions on a single circuit by assigning a different time slot to each channel.

Token Passing - Local-area network protocol which allows a station to transmit only when it has the "token," an empty slot on the carrier.

TOP - Technical Office Protocol - protocol developed by Boeing Computer Services to support administrative and office operations as complementary functions to factory automation implemented under MAP.

Turnkey System - System composed of hardware and software integrated into a total system designed to completely fulfill the processing requirements of a single application.

Twisted-Pair Cable - Communications cabling consisting of pairs of single-strand metallic electrical conductors, such as copper wires, typically used in building telephone wiring and some LANs.

Verification and Validation - Process for examining and testing applications and special systems software to verify that it operates on the target CPU and performs all of the functions specified by the user.

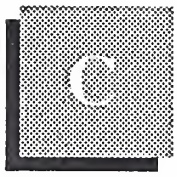
Voice-Grade - Circuit or signal in the 300-3300 Hz bandwidth typical of the public telephone system - nominally a 4 KHz user.

VTAM - Virtual Telecommunications Access Method - host-resident communications software for SNA networks.

E

Other Considerations

When questions arise as to the proper place to count certain user expenditures, INPUT addresses the questions from the user viewpoint. Expenditures then are categorized according to what the users perceive they are buying.



Glossary of Acronyms

The federal government's procurement language uses a combination of acronyms, phrases, and words that is complicated by different agency definitions and interpretations. The government also uses terms of accounting, business, economics, engineering, and law with new applications and technology.

Acronyms and contract terms that INPUT encountered most often in program documentation and interviews for this report are included here, but this glossary should not be considered all-inclusive. Federal procurement regulations (DAR, FPR, FAR, FIRMR, FPMR) and contract terms listed in RFIs, RFPs, and RFQs provide applicable terms and definitions.

Federal agency acronyms have been included to the extent they are employed in this report.

A

Federal Acronyms

AAS	Automatic Addressing System.
AATMS	Advanced Air Traffic Management System.
ACO	Administrative Contracting Offices (DCAS).
ACS	Advanced Communications Satellite (formerly NASA 30/20 GHzSatellite Program).
ACT-1	Advanced Computer Techniques (Air Force).
Ada	DoD High-Order Language.
ADA	Airborne Data Acquisition.
ADL	Authorized Data List.
ADS	Automatic Digital Switches (DCS).
AFA	Air Force Association.
AFCEA	Armed Forces Communications Electronics Association.
AGE	Aerospace Ground Equipment.
AIP	Array Information Processing.
AIS	Automated Information System.
AMPE	Automated Message Processing Equipment.

AMPS	Automated Message Processing System.
AMSL	Acquisition Management Systems List.
ANG	Army National Guard.
AP(P)	Advance Procurement Plan.
Appropriation	Congressionally approved funding for authorized programs and activities of the Executive Branch.
APR	Agency Procurement Request.
ARPANET	DARPA network of scientific computers.
ASP	Aggregated Switch Procurement.
ATLAS	Abbreviated Test Language for All Systems (for ATE-Automated Test Equipment).
Authorization	In the legislative process programs, staffing, and other routine activities must be approved by Over sight Committees before the Appropriations Committee will approve the money from the budget.
AUSA	Association of the U.S. Army.
AUTODIN	AUTOmatic DIgital Network of the Defense Communications System.
AUTOSEVOCOM	AUTOmatic SEcure VOice COMmunications Network.
AUTOVON	AUTOmatic VOice Network of the Defense Communications System.
BA	Basic Agreement.
BAFO	Best And Final Offer.
Base level	Procurement, purchasing, and contracting at the military installation level.
BCA	Board of Contract Appeals.
Benchmark	Method of evaluating ability of a candidate computer system to meet user requirements.
Bid protest	Objection (in writing, before or after contract award) to some aspect of a solicitation by a valid bidder.
BML	Bidders Mailing List - qualified vendor information filed annually with federal agencies to automatically receive RFPs and RFQs in areas of claimed competence.
BOA	Basic Ordering Agreement.
B&P	Bid and Proposal - vendor activities in response to government solicitation/specific overhead allowance.
BPA	Blanked Purchase Agreement.
Budget	Federal Budget, proposed by the President and subject to Congressional review.
C^2	Command and Control.
C^3	Command, Control, and Communications.
C^4	Command, Control, Communications, and Computers.

C^3I	Command, Control, Communications, and Intelligence.
CAB	Contract Adjustment Board or Contract Appeals Board.
CADE	Computer-Aided Design and Engineering.
CADS	Computer-Assisted Display Systems.
CAIS	Computer-Assisted Instruction System.
CALS	Computer-Aided Automated Logistic System.
CAPS	Command Automation Procurement Systems.
CAS	Contract Administration Services or Cost Accounting Standards.
CASB	Cost Accounting Standards Board.
CASP	Computer-Assisted Search Planning.
CBD	Commerce Business Daily - U.S. Department of Commerce publication listing government contract opportunities and awards.
CBO	Congressional Budget Office.
CCEP	Commercial Comsec Endorsement Program.
CCDR	Contractor Cost Data Reporting.
CCN	Contract Change Notice.
CCPDS	Command Center Processing and Display Systems.
CCPO	Central Civilian Personnel Office.
CCTC	Command and Control Technical Center (JCS).
CDR	Critical Design Review.
CDRL	Contractor Data Requirement List.
CFE	Contractor-Furnished Equipment.
CFR	Code of Federal Regulations.
CICA	Competition in Contracting Act.
CIG	Computerized Interactive Graphics.
CIR	Cost Information Reports.
CM	Configuration Management.
CMI	Computer-Managed Instruction.
CNI	Communications, Navigation, and Identification.
CO	Contracting Office, Contract Offices, or Change Order.
COC	Certificate of Competency (administered by the Small Business Administration).
COCO	Contractor-Owned, Contractor-Operated.
CODSIA	Council of Defense and Space Industry Associations.
COMSTAT	Communications Satellite Corporation.
CONUS	CONtinental United States.
COP	Capability Objective Package.
COTR	Contracting Officer's Technical Representative.
CP	Communications Processor.
CPAF	Cost-Plus-Award-Fee Contract.
CPFF	Cost-Plus-Fixed-Fee Contract.
CPIF	Cost-Plus-Incentive-Fee Contract.
CPR	Cost Performance Reports.

CPSR	Contractor Procurement System Review.
CR	Cost Reimbursement (Cost Plus Contract).
CSA	Combat or Computer Systems Architecture.
C/SCSC	Cost/Schedule Control System Criteria (also called "C-Spec").
CWAS	Contractor Weighted Average Share in Cost Risk.
DAL	Data Accession List.
DAR	Defense Acquisition Regulations.
DARPA	Defense Advanced Research Projects Agency.
DAS	Data Acquisition System.
DBHS	Data Base Handling System.
DCA	Defense Communications Agency.
DCAA	Defense Contract Audit Agency.
DCAS	Defense Contract Administration Services.
DCASR	DCAS Region.
DCC	Digital Control Computer.
DCP	Development Concept Paper (DoD).
DCS	Defense Communications System.
DCTN	Defense Commercial Telecommunications Network.
DDA	Dynamic Demand Assessment (Delta Modulation).
DDC	Defense Documentation Center.
DDL	Digital Data Link - A segment of a communications network used for data transmission in digital form.
DDN	Defense Data Network.
DDS	Dynamic Diagnostics System.
DECCO	Defense Commercial Communications Office.
DECEO	Defense Communications Engineering Office.
D&F	Determination and Findings - required documenta tion for approval of a negotiated procurement.
DIA	Defense Intelligence Agency.
DIF	Document Interchange Format, Navy-sponsored word processing standard.
DHHS	Department of Health and Human Services.
DIDS	Defense Integrated Data Systems.
DISC	Defense Industrial Supply Center.
DLA	Defense Logistics Agency.
DMA	Defense Mapping Agency.
DNA	Defense Nuclear Agency.
DO	Delivery Order.
DOA	Department of Agriculture (also USDA).
DOC	Department of Commerce.
DOE	Department of Energy.
DOI	Department of Interior.
DOJ	Department of Justice.
DOS	Department of State.
DOT	Department of Transportation.
DPA	Delegation of Procurement Authority (granted by GSA under FPRs).

DPC	Defense Procurement Circular.
DQ	Definite Quantity Contract.
DQ/PL	Definite Quantity Price List Contract.
DR	Deficiency Report.
DSCS	Defense Satellite Communication System.
DSN	Defense Switched Network.
DSP	Defense Support Program (WWMCCS).
DSS	Defense Supply Service.
DTC	Design-To-Cost.
ECP	Engineering Change Proposal.
ED	Department of Education.
EEO	Equal Employment Opportunity.
8(a) Set-Aside	Agency awards direct to Small Business Administration for direct placement with a socially/ economically disadvantaged company.
EMC	Electro-Magnetic Compatibility.
EMCS	Energy Monitoring and Control System.
EO	Executive Order - Order issued by the President.
EOQ	Economic Ordering Quantity.
EPA	Economic Price Adjustment.
EPA	Environmental Protection Agency.
EPMR	Estimated Peak Monthly Requirement.
EPS	Emergency Procurement Service (GSA) or Emergency Power System.
EUC	End User Computing, especially in DoD.
FA	Formal Advertising.
FAC	Facility Contract.
FAR	Federal Acquisition Regulations.
FCA	Functional Configuration Audit.
FCC	Federal Communications Commission.
FCDC	Federal Contract Data Center.
FCRC	Federal Contract Research Center.
FDPC	Federal Data Processing Center.
FEDSIM	Federal (Computer) Simulation Center (GSA).
FEMA	Federal Emergency Management Agency.
FFP	Firm Fixed-Price Contract (also Lump Sum Contract).
FIPS	NBS Federal Information Processing Standard.
FIPS PUBS	FIPS Publications.
FIRMR	Federal Information Resource Management Regulations.
FMS	Foreign Military Sales.
FOC	Final Operating Capability.
FOIA	Freedom of Information Act.
FP	Fixed-Price Contract.
FP-L/H	Fixed-Price - Labor/Hour Contract.

FP-LOE	Fixed-Price - Level-Of-Effort Contract.
FPMR	Federal Property Management Regulations.
FPR	Federal Procurement Regulations.
FSC	Federal Supply Classification.
FSG	Federal Supply Group.
FSN	Federal Supply Number.
FSS	Federal Supply Schedule or Federal Supply Service (GSA).
FSTS	Federal Secure Telecommunications System.
FT Fund	A revolving fund, designated as the Federal Telecommunications Fund, used by GSA to pay for GSA-provided common-user services, specifically including the current FTS and proposed FTS 2000 services.
FTSP	Federal Telecommunications Standards Program administered by NCS, Standards are published by GSA.
FTS	Federal Telecommunications System.
FTS 2000	Proposed replacement for the Federal Telecommunications System.
FY	Fiscal Year.
FYDP	Five-Year Defense Plan.
GAO	General Accounting Office.
GFE	Government-Furnished Equipment.
GFM	Government-Furnished Material.
GFY	Government Fiscal Year (October to September).
GIDEP	Government-Industry Data Exchange Program.
GOCO	Government Owned - Contractor Operated.
GOGO	Government Owned - Government Operated.
GOSIP	Government Open Systems Interconnection Profile.
GPO	Government Printing Office.
GPS	Global Positioning System.
GRH	Gramm-Rudman-Hollings Act (1985), also called Gramm-Rudman Deficit Control.
GS	General Schedule.
GSA	General Services Administration.
GSBCA	General Services Administration Board of Contract Appeals.
HCFA	Health Care Financing Administration.
HHS	(Department of) Health and Human Services.
HPA	Head of Procuring Activity.
HSDP	High-Speed Data Processors.
HUD	(Department of) Housing and Urban Development.
ICA	Independent Cost Analysis.
ICAM	Integrated Computer-Aided Manufacturing.

ICE	Independent Cost Estimate.
ICP	Inventory Control Point.
ICST	Institute for Computer Sciences and Technology, National Bureau of Standards, Department of Commerce.
IDAMS	Image Display And Manipulation System.
IDEP	Interservice Data Exchange Program.
IDN	Integrated Data Network.
IFB	Invitation For Bids.
IOC	Initial Operating Capability.
IOI	Internal Operating Instructions.
IPS	Integrated Procurement System.
IQ	Indefinite Quantity Contract.
IR&D	Independent Research & Development.
IRM	Information Resources Management.
IXS	Information Exchange System.
JFMIP	Joint Financial Management Improvement Program.
JOCIT	Jovial Compiler Implementation Tool.
JSIPS	Joint Systems Integration Planning Staff.
JSOP	Joint Strategic Objectives Plan.
JSOR	Joint Service Operational Requirement.
JUMPS	Joint Uniform Military Pay System.
LC	Letter Contract.
LCC	Life Cycle Costing.
LCMP	Life Cycle Management Procedures (DD7920.1).
LCMS	Life Cycle Management System.
L-H	Labor-Hour Contract.
LOI	Letter of Interest.
LRPE	Long-Range Procurement Estimate.
LRIRP	Long-Range Information Resource Plan.
MAISRC	Major Automated Information Systems Review Council (DoD).
MANTECH	MANufacturing TECHnology.
MAPS	Multiple Address Processing System.
MAP/TOP	Manufacturing Automation Protocol/Technical and Office Protocol.
MASC	Multiple Award Schedule Contract.
MDA	Multiplexed Data Accumulator.
MENS	Mission Element Need Statement or Mission Essential Need Statement (see DD-5000.1 Major Systems Acquisition).
MILSCAP	Military Standard Contract Administration Procedures.
MIL SPEC	Military Specification.
MIL STD	Military Standard.

MIPR	Military Interdepartmental Purchase Request.
MOD	Modification.
MOL	Maximum Ordering Limit (Federal Supply Service).
MPC	Military Procurement Code.
MYP	Multi-Year Procurement.
NARDIC	Navy Research and Development Information Center.
NASA	National Aeronautics and Space Administration.
NBS	National Bureau of Standards.
NCMA	National Contract Management Association.
NCS	National Communications System; responsible for setting U.S. Government standards administered by GSA; also holds primary responsibility for emergency communications planning.
NICRAD	Navy-Industry Cooperative Research and Development.
NIP	Notice of Intent to Purchase.
NMCS	National Military Command System.
NSA	National Security Agency.
NSEP	National Security and Emergency Preparedness.
NSF	National Science Foundation.
NSIA	National Security Industrial Association.
NTIA	National Telecommunications and Information Administration of the Department of Commerce; replaced the Office of Telecommunications Policy in 1970 as planner and coordinator for government communications programs; primarily responsible for radio.
NTIS	National Technical Information Service.
Obligation	"Earmarking" of specific funding for a contract from committed agency funds.
OCS	Office of Contract Settlement.
OFCC	Office of Federal Contract Compliance.
Off-Site	Services to be provided near but not in government facilities.
OFMP	Office of Federal Management Policy (GSA).
OFPP	Office of Federal Procurement Policy.
OIRM	Office of Information Resources Management.
O&M	Operations & Maintenance.
OMB	Office of Management and Budget.
O,M&R	Operations, Maintenance, and Readiness.
On-Site	Services to be performed on a government installation or in a specified building.
OPM	Office of Procurement Management (GSA) or Office of Personnel Management.

Options	Sole-source additions to the base contract for services or goods to be exercised at the government's discretion.
OSHA	Occupational Safety and Health Act.
OSI	Open System Interconnect.
OSP	Offshore Procurement.
OTA	Office of Technology Assessment (Congress).
Out-Year	Proposed funding for fiscal years beyond the Budget Year (next fiscal year).
P-I	FY Defense Production Budget.
P3I	Pre-Planned Product Improvement (program in DoD).
PAR	Procurement Authorization Request or Procurement Action Report.
PAS	Pre-Award Survey.
PASS	Procurement Automated Source System.
PCO	Procurement Contracting Officer.
PDA	Principal Development Agency.
PDM	Program Decision Memorandum.
PDR	Preliminary Design Review.
PIR	Procurement Information Reporting.
PME	Performance Monitoring Equipment.
PMP	Purchase Management Plan.
PO	Purchase Order or Program Office.
POM	Program Objective Memorandum.
POSIX	Portable Open System Interconnection Exchange.
POTS	Purchase of Telephone Systems.
PPBS	Planning, Programming, Budgeting System.
PR	Purchase Request or Procurement Requisition.
PRA	Paperwork Reduction Act.
PS	Performance Specification - alternative to a Statement of Work, when work to be performed can be clearly specified.
QA	Quality Assurance.
QAO	Quality Assurance Office.
QMCS	Quality Monitoring and Control System (DoD software).
QMR	Qualitative Material Requirement (Army).
QPL	Qualified Products List.
QRC	Quick Reaction Capability.
QRI	Quick Reaction Inquiry.
R-I	FY Defense RDT&E Budget.
RAM	Reliability, Availability, and Maintainability.
RC	Requirements Contract.
R&D	Research and Development.

RDA	Research, Development, and Acquisition.
RDD	Required Delivery Date.
RD&E	Research, Development, and Engineering.
RDF	Rapid Deployment Force.
RDT&E	Research, Development, Test, and Engineering.
RFI	Request For Information.
RFP	Request For Proposal.
RFQ	Request For Quotation.
RFTP	Request For Technical Proposals (Two-Step).
ROC	Required Operational Capability.
ROI	Return On Investment.
RTAS	Real Time Analysis System.
RTDS	Real Time Display System.
SA	Supplemental Agreement.
SBA	Small Business Administration.
SB Set-Aside	Small Business Set-Aside contract opportunities with bidders limited to certified small businesses.
SCA	Service Contract Act (1964 as amended).
SCN	Specification Change Notice.
SDN	Secure Data Network.
SEC	Securities and Exchange Commission.
SE&I	Systems Engineering and Integration.
SETA	Systems Engineering/Technical Assistance.
SETS	Systems Engineering/Technical Support.
SIBAC	Simplified Intragovernmental Billing and Collection System.
SIMP	Systems Integration Master Plan.
SIOP	Single Integrated Operations Plan.
SNAP	Shipboard Nontactical ADP Program.
Sole Source	Contract award without competition.
Solicitation	Invitation to submit a bid.
SOR	Specific Operational Requirement.
SOW	Statement of Work.
SSA	Source Selection Authority (DoD).
SSAC	Source Selection Advisory Council.
SSEB	Source Selection Evaluation Board.
SSO	Source Selection Official (NASA).
STINFO	Scientific and Technical INFOrmation Program - Air Force/NASA.
STU	Secure Telephone Unit.
SWO	Stop-Work Order.
Synopsis	Brief Description of contract opportunity in CBD after D&F and before release of solicitation.
TA/AS	Technical Assistance/Analysis Services.
TCP/IP	Transmission Control Protocol/Internet Protocol.

TEMPEST	Studies, inspections, and tests of unintentional electromagnetic radiation from computer, communi cation, command, and control equipment that may cause unauthorized disclosure of information; usually applied to DoD and security agency testing programs.
TILO	Technical and Industrial Liaison Office—Qualified Requirement Information Program - Army.
TM	Time and Materials contract.
TOA	Total Obligational Authority (Defense).
TOD	Technical Objective Document.
TR	Temporary Regulation (added to FPR, FAR).
TRACE	Total Risk Assessing Cost Estimate.
TRCO	Technical Representative of the Contracting Offices.
TREAS	Department of Treasury.
TRP	Technical Resources Plan.
TSP	GSA's Teleprocessing Services Program.
TVA	Tennessee Valley Authority.
UCAS	Uniform Cost Accounting System.
USA	U.S. Army.
USAF	U.S. Air Force.
USCG	U.S. Coast Guard.
USMC	U.S. Marine Corps.
USN	U.S. Navy.
U.S.C.	United States Code.
USPS	United States Postal Service.
USRRB	United States Railroad Retirement Board.
VA	Veterans Affairs Department.
VE	Value Engineering.
VHSIC	Very High Speed Integrated Circuits.
VIABLE	Vertical Installation Automation BaseLine (Army).
VICI	Voice Input Code Identifier.
WBS	Work Breakdown Structure.
WGM	Weighted Guidelines Method.
WIN	WWMCCS Intercomputer Network.
WITS	Washington Interagency Telecommunications System.
WIS	WWMCCS Information Systems.
WS	Work Statement - Offerer's description of the work to be done (proposal or contract).
WWMCCS	World-Wide Military Command and Control System.

B

General and Industry Acronyms

ADAPSO	Association of Data Processing Service Organization, now the Computer Software and Services Industry Association.
ADP	Automatic Data Processing.
ADPE	Automatic Data Processing Equipment.
ANSI	American National Standards Institute.
BOC	Bell Operating Company.
CAD	Computer-Aided Design.
CAM	Computer-Aided Manufacturing.
CBEMA	Computer and Business Equipment Manufacturers Association.
CCIA	Computers and Communications Industry Association.
CCITT	Comite Consultaif Internationale de Telegraphique et Telephonique; Committee of the International Telecommunication Union.
COBOL	Common Business-Oriented Language.
COS	Corporation for Open Systems.
CPU	Central Processor Unit.
DMBS	Data Base Management System.
DRAM	Dynamic Random Access Memory.
EIA	Electronic Industries Association.
EPROM	Erasible Programmable Read-Only-Memory.
IEEE	Institute of Electrical and Electronics Engineers.
ISDN	Integrated Services Digital Networks.
ISO	International Organization for Standardization; voluntary international standards organization and member of CCITT.
ITU	International Telecommunication Union.
LSI	Large-Scale Integration.
MFJ	Modified Final Judgement.
PROM	Programmable Read-Only Memory.
RBOC	Regional Bell Operating Company.
UNIX	AT&T Proprietary Operating System.
UPS	Uninterruptable Power Source.
VAR	Value-Added Retailer.
VLSI	Very Large-Scale Integration.
WORM	Write-Once-Read-Many-Times.

C

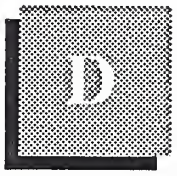
VA Commonly Used Acronyms

AACS	Automated Allotment Control System
AEMAS	Affirmative Employment Monitoring and Analysis System
ADP	Automated Data Processing
AD&RS	Applications Design and Review Service
AIRS	Appellate Index and Retrieval System
AMAS	Automated Monument Application System
AMIE	Automated Medical Information Exchange
AMIS	Automated Management Information System
AMVAD	Automated Masterfile of VA Directives
AS	Assistant Secretary
AS/A&F	Assistant Secretary for Acquisition and Facilities
AS/C&PA	Assistant Secretary for Congressional and Public Affairs
AS/F&P	Assistant Secretary for Finance and Planning
AS/HRA	Assistant Secretary for Human Resources and Administration
AS/IRM	Assistant Secretary for Information Resources Management
AS/VL&PC	Assistant Secretary for Veterans Liaison and Program Coordination
ASD/MCS	Automated Supply Deport/Marketing Center
AUS UPGD	Austin Upgrade
AUTOREC	Automated Records Management Systems
BACS	Benefit Accounting and Control System
BIRLS	Beneficiary Identification and Records Locator System
BCA	Board of Contract Appeals
BDN	Benefits Delivery Network
BOSS	Burial Operations Support Systems
BVA	Board of Veterans Appeals
CAD	Computer Aided Design
CALM	Centralized Accounting for Local Management
CAM	Computer Assisted Manufacturing
CAPPS	Computer Assisted Payment Processing System
CAROLS	Centralized Accounts Receivable Online System
CARP	Chapter 32 Accounts Receivable Program
CARS	Centralized Accounts Receivable
CASCA	Centralized Accounting for Construction Appropriations
CBD	Chief Benefits Director
CCF	Consolidated Computer Facility
CD ROM	Compact Disk Read Only Memory
CHAMPVA	Civilian Health & Medical Program of the Department of Veterans Affairs
CMD	Chief Medical Director
CPE	Clinical Practice Extensions
CP&E	Compensation, Pension and Education Systems
CO	Central Office

DAAC	District Counsel Automation Advisory Committee
DAS	Deputy Assistant Secretary
DCIS	Discrimination Complaints Information Systems
DCMIS	District Counsel Management Information Systems
DD/DS	Data Dictionary/Directory System
DELMA	Interim Loan Guaranty Automated Appraiser Assignment System
DHCP	Decentralized Hospital Computer Program
DMDC	Defense Manpower Data Center
DMMS	Decentralized Medical Management System
DOOR	Distribution of Operational Resources
DPC	Data Processing Center
DSS	Decision Support System
EDI	Electronic Data Interchange
EEO	Electronic Fund Transfer
EIS	Executive Information System
EPS	Electronic Printing System
FBS	FEE Basis System
F&FE	Fiduciary and Field Examination
FMS	Financial Management System
FORMS/ PUBS	Forms and Publications System
FTS	Federal Telecommunications System
GAD	Generate and Display
GC	General Counsel
GCATS	General Counsel Automated Tracking System
GCISD	General Counsel Information Systems Division
GDX	Geographic Distribution of Expenditures
GRS	Gravesite Reservation System
HGL	Honeywell Generated Letters
HOLAR	Hearing Officer Letters and Report System
ICB	Information Collection Budget
IDCU	Integrated Data Communications Utility
IFCAP	Integrated Funds Distribution, Control Point Activity, Accounting and Procurement, DHCP Module
IG	Inspector General
IHS	Integrated Hospital System
IIS	Integrated Information System
IPDB	Integrated Patient Database
IRM	Information Resources Management
ISC	Information System Center
ISMS	Integrated Supply Management System
ISP	Information Systems Plan

ITC	Information Technology Center
ITMP	Information Technology Management Program
LOGI	Integrated Storage and Distribution System
LPS	Loan Production System
LSI	Laboratory Systems Interface
MADSS	NCS Management and Decision Support System
MAFCS	Management and Financial Control Systems
MAMOE	Medical Administration and Misc.Operating Expense
MAS	Medical Administration, Module of the DHCP
MCTS	Message Communications Terminal Systems
MIRMO	Medical Information Resources Management Office
MSC	Message Switching Center
MUMPS	Massachusetts General Hospital Utility Multi-Programming System
NCS	National Cemetery System
NOAVA	National Office Automation for VA
OA	Office Automation
OA&MM	Office of Acquisition and Materiel Management
OB&F	Office of Budget and Finance
OF	Office of Facilities
OIG	Office of Inspector General
OIRO	Office of Information Resources Operations
OIRP&P	Office of Information Resources Plans and Policies
OLAF	On-Line Approval File
OPA	Office of Public Affairs
OPC	Outpatient Clinic
OP&LR	Office of Personnel and Labor Relations
OSDBU	Office of Small and Disadvantaged Business Utilization
OTA	Office of Technology Assessment
PAID	Personnel Accounting Integrated Data System
PCMI	Presidents Council on Management Improvement
PDC	Prosthetic Distribution Center
PTF	Patient Treatment File
RAM	Resource Allocation Model
R&P	Receivables and Payables System
RDBME	Relational Database Management Engineering
RIMS	Records Inventory Management System
RO	Regional Office
ROI	Record of Interment
RPO	Regional Processing Office

SIUG	Systems Integration Users Group
SIRB	Systems Integration Review Board
SPD	Supply Processing and Distribution
TIMS	Target Inventory Management System
VA	Department of Veterans Affairs
VACO VA	Central Office
VACOLS	Veterans Appeals Control and Locator System
VADATS	VA Data Transmission System
VARO	VA Regional Offices
VBA	Veterans Benefits Administration
VADS	Veterans Assistance Discharge System
VAMC	VA Medical Centers
VHS&RA	Veterans Health Services and Research Administration



Policies, Regulations, and Standards

A

OMB Circulars

A-11	Preparation and Submission of Budget Estimates.
A-49	Use of Management and Operating Contracts.
A-71	Responsibilities for the Administration and Management of Automatic Data Processing Activities.
A-76	Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government.
A-109	Major Systems Acquisitions.
A-120	Guidelines for the Use of Consulting Services.
A-121	Cost Accounting, Cost Recovery, and Integrated Sharing of DataProcessing Facilities.
A-123	Internal Control Systems.
A-127	Financial Management Systems.
A-130	Management of Federal Information Resources.
A-131	Value Engineering.

B

GSA Publications

The FIRMR as published by GSA is the primary regulation for use by federal agencies in the management, acquisition, and use of both ADP and telecommunications information resources.

C

DoD Directives

DD-5000.1	Major System Acquisitions.
DD-5000.2	Major System Acquisition Process.
DD-5000.11	DoD Data Elements and Data Codes Standardization Program.
DD-5000.31	Interim List of DoD-Approved High-Order Languages.
DD-5000.35	Defense Acquisition Regulatory Systems.
DD-5200.1	DoD Information Security Program.
DD-5200.28	Security Requirements for Automatic Data Processing (ADP) Systems.

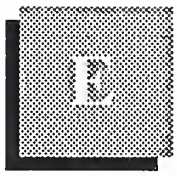
DD-5200.28-M	Manual of Techniques and Procedures for Implement ing, Deactivating, Testing, and Evaluating Secure Resource Sharing ADP Systems.
DD-7920.1	Life Cycle Management of Automated Information (AIS).
DD-7920.2	Major Automated Information Systems Approval Process.
DD-7935	Automated Data Systems (ADS) Documentation.

D

Standards

ADCCP	Advanced Data Communications Control Procedures; ANSI Standard X3.66 of 1979; also NBS FIPS 71.
CCITT G.711	International PCM standard.
CCITT T.0	International standard for classification of facsimile apparatus for document transmission over telephone-type circuits.
DEA-1	Proposed ISO standard for data encryption based on the NBS DES.
EIA RS-170	Monochrome video standard.
EIA RS-170A	Color video standard.
EIA RS-464	EIA PBX standards.
EIA RS-465	Standard for Group III facsimile.
EIA RS-466	Facsimile standard; procedures for document transmission in the General Switched Telephone Network.
EIA RS-232-C	EIA DCE to DTE interface standard using a 25-Pin connector; similar to CCITT V-24.
EIA RS-449	New EIA standard DTE to DCE interface which replaces RS-232-C.
FED-STD 1000	Proposed Federal Standard for adoption of the full OSI reference model.
FED-STD 1026	Federal Data Encryption Standard (DES) adopted in 1983; also FIPS 46.
FED-STD 1041	Equivalent to FIPS 100.
FED-STD 1061	Group II Facsimile Standard (1981).
FED-STD 1062	Federal standard for Group III facsimile; equivalent to EIA RS-465.
FED-STD 1063	Federal facsimile standard; equivalent to EIA RS-466.
FED- STDs 1005, 1005A-1008	Federal Standards for DCE Coding and Modulation.
FIPS 46	NBS Data Encryption Standard (DES).
FIPS 81	DES Modes of Operation.
FIPS 100	NBS Standard for packet-switched networks; subset of 1980 CCITT X.25.
FIPS 107	NBS Standard for local area networks, similar to IEEE 802.2 and 802.3.

FIPS 146	Government Open Systems Interconnection (OSI) Profile (GOSIP).
FIPS 151	NIST POSIX (Portable Operating System Interface for UNIX) standard.
IEEE 802.2	OSI-Compatible IEEE standard for data-link control in local area networks.
IEEE 802.3	Local-area network standard similar to Ethernet.
IEEE 802.4	OSI-compatible standard for token-bus local area networks.
IEEE 802.5	Local-area networks standard for token-ring networks.
IEEE P1003.1	POSIX standard, similar to FIPS 151.
MIL-STD-188-114C	Physical interface protocol similar to RS-232 and RS-449.
MIL-STD-1777	IP-Internet Protocol.
MIL-STD-1778	TCP - Transmission Control Protocol.
MIL-STD-1780	File Transfer Protocol.
MIL-STD-1781	Simple Mail Transfer Protocol (electronic mail).
MIL-STD-1782	TELNET - virtual terminal protocol.
MIL-STD-1815A	Ada Programming Language Standard.
SVID	UNIX System Interface Definition.
X.12	ANSI standard for Electronic Data Interchange.
X.21	CCITT Standard for interface between DTE and DCE for synchronous operation on public data networks.
X.25	CCITT standard for interface between DTE and DCE for terminals operating in the packet mode on public data networks.
X.75	CCITT standard for links that interface different packet networks.
X.400	ISO Application-level standard for the electronic transfer of messages (electronic mail).



Related INPUT Reports

A

Annual Market Analyses

Procurement Analysis Reports, FY 1990-1995

B

Market Reports

Federal Professional Services Market, 1990-1995

Federal Software and Related Services Market, 1989-1994

Federal Systems Integration Market, 1990-1995

Federal Microcomputer Market, 1989-1994

Defense Logistics Agency Information Services Market

Federal Processing Services and Operations Support Market, 1989-1994

Federal Electronic Data Interchange Market, 1989-1994

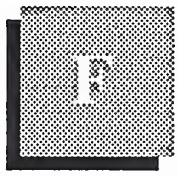
Federal Financial Systems Market, 1990-1995

Federal Equipment Maintenance Market, 1990-1995

Federal Computer Security Market, 1990-1995

Federal Telecommunications Market, 1990-1995

Federal Education and Training Market



Questionnaires

A cover letter to VA and vendor respondents explained that for the purposes of this study, INPUT has defined information systems and services (IS) "for ADP" as follows:

Processing Services - Includes transaction processing, utility processing, other processing services, and systems operations; also referred to as "resource management," facilities management or "COCO" (contractor-owned, contractor-operated).

Network Services - A wide variety of network-based functions and operations. The common thread is that none of these functions could be performed without network involvement. Network services includes VANS and network applications (electronic information systems).

Software Products - Includes user purchases of applications and systems software packages for in-house computer systems. Included are lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites.

Professional Services - Software development, education and training, consulting, and systems operations of client-owned equipment ("GOCO" government-owned, contractor-operated) are included in this category.

Turnkey Systems - An integration of systems and applications software with CPU hardware and peripherals, packaged as a single application (or set of applications) solution.

Systems Integration - Delivery of large, complex multidisciplinary, multivendor systems incorporating some or all of these categories: systems design, programming, integration, equipment, packaged software, communication networks, installation, education and training, and systems-integration-related professional services. These contracts usually take at least one year to complete and involve a prime contractor.

Hardware - Includes all computer processors/terminals, and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system.

A

Department of Veterans Affairs Information Systems Market, 1991-1996
VA Respondent Questionnaire

CONFIDENTIAL

1. In your opinion, in what functional areas does the Department of Veterans Affairs (VA) intend to use information technology more effectively over the next five years?

_____
_____
_____

2a. Do you expect VA's information architecture, i.e., the overall framework of active systems, to change over the next five years? **(check one)**

Yes ____ No ____ Don't know ____

2b. If yes, please explain:

_____
_____
_____

3. Overall, do you anticipate the amount of information systems and services that VA will procure during the next five years will: **(check one)**

Increase ___
Decrease ___
Remain the same ___
Don't know ___

4. For each of the following categories, please indicate if you expect an increase or decrease in acquisitions within your organization over the next five years, and can you estimate by what percent?

IS Category *(check one column only)*	Increase	Decrease	Remain the Same	Indicate Percent Change
Professional Services	___	___	___	___
Software Products	___	___	___	___
Processing Services	___	___	___	___
Systems Integration Services	___	___	___	___
Network Services	___	___	___	___
Turnkey Systems	___	___	___	___
Hardware	___	___	___	___

5. Rate the importance of VA adhering to each of the following standards for new or replacement information systems through FY1996. Use a 1-5 scale where 5=extremely important to adhere to; and 1=not important at all to adhere to. Also indicate your reason for each rating.

Standard	Circle Rating	Reason
GOSIP	1 2 3 4 5	_____ _____
POSIX	1 2 3 4 5	_____ _____
SQL	1 2 3 4 5	_____ _____
TCP/IP	1 2 3 4 5	_____ _____
Other (specify): _____	1 2 3 4 5	_____ _____

6a. Do or will VA applications/systems need to communicate with other brands of equipment? **(check one)**

Yes ____ No ____ Don't know ____

6b. If yes, what system(s) are/will be connected to each other, and what product(s) are/will provide the connectivity?

System A to System B (specify current or planned connected systems - mfg./model)		**Specify Connectivity Products for Each Case of Connected Systems**
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. Which current VA application systems that you are aware of include batch procedures which need to be upgraded to online systems? For each application indicate how you think the upgrade will most likely be accomplished (i.e. through a formal RFP, GSA Schedule Order, In-house effort, or other).

Indicate Application	**Upgrade Method**
_____	_____
_____	_____
_____	_____

8. For each of the following types of technology, how critical do you think they will be to VA information systems operations through FY 1996? Use a 1-5 scale; where 5 = extremely critical and 1 = not critical at all. Indicate the reason behind your rating.

Technology Type	**Circle Rating**	**Reason**
Data base Machines	1 2 3 4 5	_____
		_____
EDI	1 2 3 4 5	_____
		_____
Imaging Systems	1 2 3 4 5	_____
		_____
UNIX	1 2 3 4 5	_____
		_____

AI/Expert Systems	1 2 3 4 5	_____
CASE Tools	1 2 3 4 5	_____
4 and 5GLs	1 2 3 4 5	_____
SQL Products	1 2 3 4 5	_____
Other (specify):_____	1 2 3 4 5	_____

9. In your opinion what changes in VA's mission, organization, or leadership could lead to changes in information systems needs?

_____
_____
_____

10. Generally, VA prefers to use fixed price contracts. In your opinion what types of projects tend to use other forms of contracting?

_____
_____
_____

11. How frequently do you think your organization will use systems integration contractors over the next five years? Use the 1-5 scale; where 5 = extremely frequently, and 1 = not frequently at all.

Circle One: 1 2 3 4 5

12. What types of VA information systems needs are more likely to be systems integration projects?

_____
_____

13. What do you view as the three most significant VA information systems initiatives for FY91-96?

Specify initiatives:_____

14. Use the 1-5 scale again to rate the importance of each of the following criteria to your organization in making information systems/service contract awards. (5 = extremely important to consider and 1= not important to consider at all)

Criteria	Circle Rating
Contract Type	1 2 3 4 5
Risk Containment Procedures	1 2 3 4 5
Initial Cost	1 2 3 4 5
Technical Solution	1 2 3 4 5
Life Cycle Cost	1 2 3 4 5
Project Management Skills/Responsibilities	1 2 3 4 5

15. What, if any, has been the impact of department status on your organization's IRM structure and IRM planning process?

16. Overall, what has been the impact of department status on the structure and planning of VA information systems?

17. What other factors (i.e., technology, budget issues, legislation, industry trends) might impact VA's acquisitions of computer systems and services?

B

Department of Veterans Affairs Information Systems Market, 1991-1996 Vendor Questionnaire

Confidential

1a. Does your company now provide or hope to provide information systems or services to the Department of Veterans Affairs (VA)? **(check one)**

Yes, currently provides	____
Yes, hoping to win contracts	____
No	____ **(end interview)**

1b. What information systems and services has your company provided to VA in FY89? Or hope to provide through FY96? **(check all current and future services that apply)**

	Offered FY89? (check all that apply in each column)	**Offered in Future?**
Professional Services	_____	_____
Software Products	_____	_____
Processing Services	_____	_____
Systems Integration	_____	_____
Network Services	_____	_____
Turnkey Systems	_____	_____
Hardware	_____	_____
Other (specify):	_____	_____

_____

2. In your opinion, what categories of information systems and services provide the most attractive opportunities for your company at VA? **(check all that apply)**

Professional Services	____
Software Products	____
Processing Services	____
Systems Integration	____
Network Services	____
Turnkey Systems	____
Hardware	____
Other (specify):	____

_____

3a. Overall, do you anticipate any changes in the amount of information systems and services your company will provide to VA through FY96? **(check one)**

Yes ____
No ____ **(go to Q4)**
Don't know ____ **(go to Q4)**

3b. If yes, in which of the following categories do you expect either an increase or decrease in revenue over the next five years, and can you estimate by what percent?

	Increase	**Decrease**	**Indicate % Change**
	(check one column)		
Professional Services	____	____	_____
Software Products	____	____	_____
Processing Services	____	____	_____
Systems Integration	____	____	_____
Network Services	____	____	_____
Turnkey Systems	____	____	_____
Hardware	____	____	_____

4. Indicate any differences your company sees between marketing products and services to VA versus other sectors of the federal market:

Differences

_____

_____

_____

_____

_____

5a. Are there any unique problems associated with winning or fulfilling contracts with the VA? **(check one)**

Yes ___
No ___
Don't know ___

5b. If yes, what are they?

_____

_____

_____

6. Indicate which categories of systems or services your company provides to VA as a subcontractor, or as a "team" participant? **(check all that apply)**

Professional Services ____
Software Products ____
Processing Services ____
Systems Integration ____
Network Services ____
Turnkey Systems ____
Hardware ____
Other (specify): ____
_____

7. What major programs do you expect VA to initiate through FY96?

Specify initiatives: _____

_____

_____

_____

_____

8. What type of contract does your company expect to dominate at VA for each category of information systems or services through FY96?

	Cost Plus	Fixed Price	Fixed Labor	Award Fee	Mix
(check one contract type for each category)					
Professional Services	____	____	____	____	____
Software Products	____	____	____	____	____
Processing Services	____	____	____	____	____
Systems Integration	____	____	____	____	____
Network Services	____	____	____	____	____
Turnkey Systems	____	____	____	____	____
Hardware	____	____	____	____	____

9. I'd like you to put in rank order what you think have been VA's controlling criteria in the selection of contractors for IS? **(Read the following list, rank the criteria in 1, 2, 3, order, etc., where 1 means most important, and 6 means least important)**

Criteria	Indicate Rank Order
Contract Type	____
Risk Containment Procedures	____
Initial Cost	____
Technical Solution	____
Life Cycle Cost	____
Other (specify): _____	____

10. How do you think vendors should improve their products or services to make them more valuable to VA?

Please explain: _____

_____

_____

11. What impact, if any, have budget constraints had on VA's acquisitions of computer systems and services?

Please explain:_____

_____

_____

12. In your opinion, how has VA's elevation to department status impacted its planning and acquisition of information systems and services?

Please explain:_____

_____

_____

13. What industry trends or other external factors might impact VA's acquisitions of computer systems and services? (i.e., Ada, AI, teaming, mergers, etc.)

Please explain:_____

_____

14. How are standards activities impacting VA's acquisition of information systems and services?

Please explain:_____

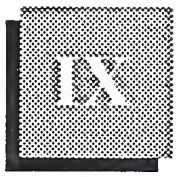
_____

_____

15. What technological improvements do you foresee altering the way VA accomplishes information processing during the next 5 years?

Please explain:_____

_____



About INPUT

Company Profile

INPUT provides planning information, analysis, and recommendations to managers and executives in the information services industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Continuous-information advisory services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services (software products, processing and network services, systems management, and systems/software maintenance and support).

Many of INPUT's professional staff have more than 20 years' experience in their areas of specialization. Most have held management positions in large organizations, enabling them to supply practical solutions to complex business problems.

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

Staff Credentials

INPUT's staff have been selected for their broad background in a variety of functions, including planning, marketing, operations, and information processing. Many of INPUT's professional staff have held executive positions in some of the world's leading organizations, both as vendors and users of information services, in areas such as the following:

- Processing Services
- Professional Services
- Turnkey Systems
- Applications Software
- Field (customer) Service
- Banking and Finance
- Insurance
- Process Manufacturing
- Telecommunications
- Federal Government

Educational backgrounds include both technical and business specializations, and many INPUT staff hold advanced degrees.

U.S. and European Advisory Services

INPUT offers the following advisory services on an annual subscription basis.

1. Market Analysis Program—U.S.
The Market Analysis Program provides up-to-date U.S. information services market analyses, five-year forecasts, trend analyses, vertical/cross-industry market reports, an on-site presentation, hotline inquiry service, and sound recommendations for action. It covers software products, turnkey systems, processing and network services, and professional services markets. It is designed to satisfy the planning and marketing requirements of current and potential information services vendors.

2. Market Analysis Program—Europe
This program is designed to help vendors of software and services with their market planning. It examines the issues in the marketplace, from both a user and a vendor viewpoint. It provides detailed five-year market forecasts to help plan for future growth.

3. Vendor Analysis Program—U.S.
A comprehensive reference service covering more than 400 U.S. information services vendor organizations, VAP is often used for competitive analysis and prescreening of acquisition and joint-venture candidates. Profiles on leading vendors are updated regularly, and hotline inquiry service is provided.

4. Vendor Analysis Program—Europe
This is an invaluable service for gaining competitive information. Two binders are provided—one is a directory listing names, addresses, and turnover of some 700 European software and services vendors. The second binder contains profiles of about 300 key vendors.

5. Electronic Data Interchange Program
Focusing on what is fast becoming a major computer/communications market opportunity, this program keeps you well informed. Through monthly newsletters, timely news flashes, comprehensive studies, and telephone inquiry privileges, you will be informed and stay informed about the events and issues impacting this burgeoning market.

6. Network Services Program—Europe
Network services is a fast-growing area of the software and services industry. This program is essential to vendors of EDI, electronic information services, and network products and services. It keeps clients informed of the latest developments and includes a monthly newsletter on EDI.

7. Systems Integration Program—U.S.
Focus is on the fast-moving world of systems integration and the provision of complex information systems requiring vendor management and installation of multiple products and services. The program includes an annual market analysis of the U.S. systems integration market, SI vendor profiles and updates, topical market analysis reports, and an annual SI seminar.

8. Systems Operations Program—U.S.
This program focuses on the exciting resurgence of the market for outsourcing systems operations. It includes an annual market analysis report of the systems operations market, SO vendor profiles and updates, topical market analysis reports, and an annual SO seminar.

9. Systems Management Program—Europe
Systems integration and systems operations (facilities management) are key growth areas for the decade. This program examines these two areas and analyzes current market trends, user needs, and vendor offerings.

10. Federal Information Systems and Services Program
This program presents highly specific information on U.S. federal government procurement practices, identifies information services vendor opportunities, and provides guidance from INPUT's experienced Washington professionals to help clients maximize sales effectiveness in the federal government marketplace.

11. State Information Systems and Services Program (proposed)
This program presents extensive information on state government spending, procurement policies, identifies key contacts, opportunities, and provides guidance from INPUT's experienced professionals to help clients maximize sales opportunities in the state government marketplace.

12. Information Systems Program
ISP is designed for executives of large information systems organizations and provides crucial information for planning, procurement, and management decision making. This program is widely used by both user and vendor organizations.

13. Customer Service Program—International
This program provides customer service organization management with data and analyses needed for marketing, technical, financial, and organizational planning. The program pinpoints user perceptions of service received, presents vendor-by-vendor service comparisons, and analyzes and forecasts service markets for large systems, minicomputers, personal computer systems, and third-party maintenance. A monthly newsletter helps clients keep informed of the latest developments in the market.

14. Customer Service Program—Europe
Customer service is an expanding area. Companies are now expanding from hardware service to more software-related maintenance and professional services. This program helps vendors penetrate these new areas and provides guidelines for future market strategy. A monthly newsletter helps clients keep abreast of the latest developments in the market.

15. Worldwide Information Services Market Forecasts
In 1989 INPUT initiated this research study, which provides an international forecast for the information services market.

Customized Advisory Services

In addition to standard continuous-information programs, INPUT will work with you to develop and provide a customized advisory service that meets your unique requirements.

Acquisition Services

INPUT also offers acquisition services that are tailor-made for your requirements. INPUT's years of experience and data base of company information about information systems and services companies have helped many companies in their acquisition processes.

An Effective Combination

INPUT'S Executive Advisory Services are built on an effective combination of research-based studies, client meetings, informative conferences, and continuous client support. Each service is designed to deliver the information you need in the form most useful to you, the client. Executive Advisory Services are composed of *varied combinations of the following products and services:*

Research-Based Studies
Following a proven research methodology, INPUT conducts major research studies throughout each program year. Each year INPUT selects issues of concern to management. Topical reports are prepared and delivered throughout the calendar year.

Information Service Industry Reports
INPUT's Executive Advisory Services address specific issues, competitive environments, and user expenditures relative to:

- Software Products
- Processing Services
- Network Services
- Systems Integration
- Systems Operations
- Professional Services
- Turnkey Systems
- Small-Systems Service
- Third-Party Maintenance
- Large-Systems Service

Industry-Specific Market Reports

Detailed analyses of market trends, forces driving the markets, problems, opportunities, and user expenditures are available for the following sectors:

- Discrete Manufacturing
- Process Manufacturing
- Transportation
- Utilities
- Telecommunications
- Retail Distribution
- Wholesale Distribution
- Banking and Finance
- Insurance
- Medical
- Education
- Business Services
- Consumer Services
- Federal Government
- State and Local Government
- Miscellaneous Industries

Cross-Industry Market Reports

A separate analysis covers the following cross-industry application areas:

- Accounting
- Education and Training
- Engineering and Scientific
- Human Resources
- Office Systems
- Planning and Analysis
- Other Cross-Industry Sectors

Hotline: Client Inquiry Services

Inquiries are answered quickly and completely through use of INPUT's Client Hotline. Clients may call any INPUT office (San Francisco, New York, Washington D.C., London, or Paris) during business hours or they may call a voicemail service to place questions after hours. This effective Hotline service is the cornerstone of every INPUT Executive Advisory Service.

The Information Center

One of the largest and most complete collections of information services industry data, the Information Center houses literally thousands of up-to-date files on vendors, industry markets, applications, current/emerging technologies, and more. Clients have complete access to the Information Center. In addition to the information contained in its files, the center maintains an 18-month inventory of over 130 major trade publications, vendor consultant manuals, economic data, government publications, and a variety of important industry documents.

Access to INPUT Professional Staff

Direct access to INPUT's staff, many of whom have more than 20 years of experience in the information industry, provides you with continuous research and planning support. When you buy INPUT, you buy experience and knowledge.

Client Conference

You can attend INPUT's Client Conference. This event addresses the status and future of the information services industry, the competitive environment, important industry trends potentially affecting your business, the impact of new technology and new service offerings, and more.

You will attend with top executives from many of the industry's leading, fastest-growing, and most successful vendor companies—and with top Information Systems (IS) managers from some of the world's most sophisticated user organizations.

On-Site Presentation by INPUT Executives

Many of INPUT's programs offer an informative presentation at your site. Covering the year's research, this session is scheduled at the convenience of the client.

Proprietary Research Service

INPUT conducts proprietary research that meets the unique requirements of an individual client. INPUT's custom research is effectively used:

For Business Planning

Planning for new products, planning for business startups, planning for expansion of an existing business or product line—each plan requires reliable information and analysis to support major decisions. INPUT's dedicated efforts and custom research expertise in business planning ensure comprehensive identification and analysis of the many factors affecting the final decision.

For Acquisition Planning

Successful acquisition and divestiture of information services companies requires reliable information. Through constant contact with information services vendor organizations and continuous tracking of company size, growth, financials, and management "chemistry," INPUT can provide the valuable insight and analysis you need to select the most suitable candidates.

For the Total Acquisition Process

INPUT has the credentials, the data base of company information, and—most importantly—the contacts to assist you with total acquisition and/or partnering relationship processes:

- Due Diligence
- Schedules and Introduction
- Criteria & Definitions
- Retainer and Fee-Based
- Active Search

For Competitive Analysis
Knowing marketing and sales tactics, product capabilities, strategic objectives, competitive postures, and strengths and weaknesses of your competition is as critical as knowing your own. The career experience of INPUT's professionals—coupled with INPUT's collection and maintenance of current financial, strategic, tactical, and operational information about more than 400 active companies—uniquely qualifies INPUT to provide the best competitive information available today.

For Market and Product Analysis
Developing new products and entering new markets involves considerable investment and risk. INPUT regularly conducts research for clients to identify product requirements, market dynamics, and market growth.

More About INPUT...

- More than 5,000 organizations, worldwide, have charted business directions based on INPUT's research and analysis.
- Many clients invest more than $50,000 each year to receive INPUT's recommendations and planning information.
- INPUT regularly conducts proprietary research for some of the largest companies in the world.
- INPUT has developed and maintains one of the most complete information industry libraries in the world (access is granted to all INPUT clients).
- INPUT clients control an estimated 70% of the total information industry market.
- INPUT analyses and forecasts are founded upon years of practical experience, knowledge of historical industry performance, continuous tracking of day-to-day industry events, knowledge of user and vendor plans, and business savvy.
- INPUT analysts accurately predicted the growth of the information services market—at a time when most research organizations deemed it a transient market. INPUT predicted the growth of the microcomputer market in 1980 and accurately forecasted its slowdown in 1984.

For More Information . . .
INPUT offers products and services that can improve productivity, and ultimately profit, in your firm. Please give us a call today. Our representatives will be happy to send you further information on INPUT services or to arrange a formal presentation at your offices.

For details on delivery schedules, client service entitlement, or Hotline support, simply call your nearest INPUT office. Our customer support group will be available to answer your questions.

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