Market
Analysis
Program
(MAP)

Industry Sector Markets 1991-1996

Federal Government Sector

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INDUSTRY SECTOR MARKETS 1991-1996

FEDERAL GOVERNMENT SECTOR

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Market Analysis Program (MAP)

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Introduction

I

Introduction

A

Purpose and Methodology

1. Purpose

The basic objectives of this Market Analysis Program (MAP) industry sector report are to

- Introduce the reader to the federal government sector structure and demographics

- Identify the government issues and trends that are driving the use of information services within this sector

- Discuss how federal government agencies use information services, and the issues facing the information systems organizations

- Discuss the information services market within the federal government sector, including market sizing and the factors driving market demand for each delivery mode

- Describe the competitive environment and profile leading information services vendors that sell to the federal government sector

2. Methodology

Most of the data on which this report is based were gathered during 1991 as part of INPUT's ongoing Federal Information Systems and Services Program (FISSP). Trends, market size, and growth rates are based primarily on government budgets and IS plans, and in-depth interviews with federal agency officials and the IS vendors serving the federal government sector. INPUT maintains ongoing relationships with, and a data base of all users, contract officers and vendors that it interviews. The research portion of this report is based on the results of the current year's interviews and analyses of government documentation. The official Budget of

the United States for Fiscal Year 1992, related portions of agency detailed budgets in response to the Office of Management and Budget Circular A-11-FY 1992 edition, Congressional Committee oversight and apportionment meeting records, and over 35 computer and general business periodicals were used to develop the foundation for the 1990 base year, 1991 current year, and 1992 budget request user expenditures.

Each year, INPUT converts the government's fiscal year (October to September) expenditures—also called outlays—and budget requests into calendar year expenditures, to comply with the MAP baseline. The forecasts are derived from an INPUT-developed budget model that is modified to reflect the views of the agency officials and vendors interviewed for other delivery mode reports produced for FISSP clients. Future (out-year) values are tested against agency long-range forecasts, the OMB/GSA Five-Year Information Technology Report, and specific congressional committee actions.

It must be noted that the federal government's budget request and outlay documents do not provide detailed expenditure values by INPUT's defined delivery modes. Additionally, agencies and vendors use different service categories to describe the market. INPUT uses particular programs and contracts to verify the values selected, and requires that the total of delivery modes equal the total values of expenditures specified in the government documentation. The specific values of delivery mode and individual segment forecasts are made on a best-effort basis, and should be viewed as indicators of general patterns and trends, and not as precise values.

B

Industry Structure

The federal government is the largest employer in the United States, with an annual budget that exceeds the GNP of all nations other than the USSR and the People's Republic of China, and in 1990 actually equals the GNP of West Germany. The 1992 Fiscal Year Budget Request submitted to Congress was $1,578 billion, or in current terms, $1.6 trillion.

The proposed expenditures vary to some degree every year. The key segments of the fiscal year 1992 expenditures are:

- 41% direct payment of benefits to individuals
- 20% national defense
- 14% interest on the national debt
- 12% grants to states and localities
- 7% other federal operations
- 6% deposit insurance

The government is organized into three branches, each of which has duties and responsibilities defined generally by the Constitution, and more specifically by legislation and executive orders. The executive branch, headed by the President and his executive office, is composed of 14 cabinet-level departments, 11 major administrations/agencies, more than 100 independent commissions/councils/conferences, and 10 GSEs (government sponsored enterprises).

Federal employment at the end of fiscal year 1990 was 5,234,711, involving several retirement, disability insurance, and medical care systems. The distribution of employees was:

Executive branch civilians	2,213,471
Department of Defense (military)	2,069,357
Postal Service	816,948
Coast Guard	37,087
Legislative and judicial branches	61,100

The government performs a wide range of functions, including:

- Governance—the operation of the government
- Taxation and coinage
- National defense
- Enforcement
- Justice
- Control and regulation
- Investment
- Relations with other countries
- Services to businesses and individuals

The performance of these functions employs the widest range of skills, tools, processes, and management encountered in industry, plus additional functions that are applicable only to the business of government. Many of these processes, practices, and procedures are identical to their industrial counterparts, requiring the same kind of personnel and experience. The principal difference lies in the measure of performance or worth. In general business, capital investment and profit are key performance indicators. The government, instead, measures mission completion and the grade of services rendered to the public.

Commercial activities supporting the federal government fall under Code 99 of the Standard Industrial Classification (SIC) and Code 9xxx of the newer Enterprise Industrial Services Classification (EISC) Code. No specific statistics are available on this market.

C

Organization and Contents of Report

The remainder of this report is organized as follows:

• Chapter II, Trends, Events, and Issues, provides information on the domestic and international issues and trends that are driving the use of information services within this sector.

This chapter focuses on:

- International, domestic, and budgetary trends, including the trade imbalance, cessation of the Cold War, the Middle East crisis, economic downturn and recession prospects, domestic issues, budget deficit problems, and trends in the use of technology to improve basic operational practices

- Federal government-specific trends and issues, including planning and management improvements, more efficient resource utilization, new security and privacy measures, staff shortages and congressional micromanagement

• Chapter III, Information Systems Environment, provides an overview of the processes in the federal government sector and their supporting information systems applications. The report discusses how the government uses information services to operate and manage its activities. Included are issues and trends unique to the IS environment within the government.

• Chapter IV, Information Services Market, looks at federal government information services from two viewpoints:

- By delivery mode: How are these services delivered? INPUT's major categories of delivery modes are:

  · Processing Services
  · Turnkey Systems
  · Applications Software
  · Systems Operations
  · Systems Integration
  · Professional Services
  · Network Services

- By major agencies: Who is buying information services? Which agencies are buying the largest or most significant amounts of what delivery modes?

Overall market forecasts are provided by delivery mode.

- Chapter V, Competitive Environment, identifies leading IS vendors in the federal government IS market, and discusses some of the factors that affect the competitive dynamics of this sector.

- Chapter VI, Conclusions and Recommendations, reviews the trends and opportunities described in the report and provides recommendations for vendors as well as agencies.

In addition, there are two appendixes:

Appendix A presents federal government-specific definitions used in this sector report.

Appendix B presents the forecast data base and the forecast reconciliation. The forecast data base (1990-1996) contains a yearly forecast of user expenditures by delivery mode. The forecast reconciliation compares this report's forecast with that provided last year (1990-1995), and explains the reasons for major differences and redistribution of some submodes between the two reports.

II

Trends, Events, and Issues

II

Trends, Events, and Issues

This chapter highlights the external forces-including international and domestic events and technology trends-that are driving the federal government and how the sector is responding to these forces. This chapter also identifies resulting issues facing federal agencies that influence the response of IS vendors in meeting agency needs.

A

Economic Trends, Events, and Issues

The key external economic events and trends in the federal government sector are summarized in Exhibit II-1, and budgetary issues and trends are shown in Exhibit II-3. The extent to which the federal government will respond to the countervailing forces of a general recession along with the resultant loss of tax revenue, the demands of unregulated international trade, and the present Middle East crisis is difficult to forecast. There certainly will be a loss of funding for a range of proposed IS projects, which could be partially offset by increasing labor and software demands. The likely scenarios are presented in Section III.

EXHIBIT II-1

Federal Government Sector
Economic Events and Trends

- Trade imbalance
- Economic recession
- Cold war cessation
- Domestic problems
- Middle East situation
- Budget deficit

1. Trade Imbalance

The U.S. trade imbalance continues to depress the value of the dollar. Opposition to free trade conditions under the GATT is coming from subsidized European farmers; continued farm support from the U.S. will likely be required, impacting budget reductions.

2. Cold War Cessation

There is not likely to be any immediate peace dividend from the end of the Cold War and the democratization of Eastern European countries. Significant strategic policy changes will take time, and the side effects of arms reduction present difficult political choices. Congress will be required to accept extensive military base closings, shutdown of military production facilities, and termination of many thousands of civilian and military personnel. The new $291 billion 1992 defense budget is essentially a slow decline of the defense programs of the 1980s.

3. Middle East

The Iraq situation impacted both the federal budget and the national economy, with some payments still due from partner countries. The economic sanctions cost U.S. companies considerable export business and drove up the cost of petroleum. The current talks underway in Spain about peace in the Middle East may drag on for years. Military and relief outlays may continue through the mid-1990s.

4. Economic Recession

Several reasons have been advanced to explain the downward spiral of the economy, both domestic and international. The real estate boom, junk bonds for leveraged buyouts, and unregulated investments by the thrifts have led to both a staggering debt and the loss of credibility for many businesses. The eventual cost of S&L bailouts alone makes any real federal budget reduction extremely difficult. At a time when the defense industry is looking to the commercial sector for new opportunities, that sector is being negatively impacted. The federal budget is unlikely to be able to stimulate the economy as it has in the past, and will also likely be impacted by fewer tax dollars.

5. Domestic Problems

The present administration has not effectively handled a range of mounting domestic issues. Among the issues supported by vocal, single-issue groups are adequate shelter for the homeless, prominent health problems like AIDS and cancer, care for the elderly and minorities, continued air/

land/water pollution problems, the drug war, overloaded prisons, rising unemployment, and the rising costs of health care, to name just a few. Federal resources and funding cannot adequately address all of these without presenting an even bigger threat to federal fiscal health.

6. Budget Deficit

The 1992 budget message addressed the unresolved deficit problem in terms of the threats to a balanced budget and the unwillingness to measure and control the real deficit. OMB noted the following budgetary threats:

- The federal share of rising health costs (the annual budget share is 15% in the 1990s)

- Unfunded liabilities for Medicare (over $250 billion)

- Rising budgetary claims of mandatory programs (61% of the 1992 budget)

- Unfunded retirement program liabilities (currently over $14 billion)

- Obligations to clean up federal facilities ($50 to $80 billion)

- Contingent risks of federal credit and insurance programs ($4 trillion, excluding Medicare)

The proposed budget package to reduce the deficit over the next five years is still using the Social Security Fund to conceal part of the deficit, even though it is "off-budget." The increasing social security surpluses have masked the true size of the "on-budget" operating deficit. Removal of the other adjustments revealed an on-budget policy deficit of $280.9 billion with recommended changes, or $255.2 billion without them.

B
Technology Trends

The key technology trends affecting the federal government sector are discussed below and outlined in Exhibit II-2.

1. Expanded Networks and LANs

The federal government is expanding its computer networks and use of local-area networks (LANs). Agency applications already directed to LANs include administration, project management, data bases, and finance. Over the next few years, mission support and personnel functions will also migrate to LANs in order to distribute information among various user groups.

EXHIBIT II-2

Federal Government Sector Technology Trends

- Expanded networks/LANs
- Improved graphics/imaging
- Advanced operating systems
- Artificial intelligence
- Enhanced microcomputers
- Advanced communications

2. Advanced Operating Systems

Advancements in operating systems will support the increasing interoperability most agencies need. The volume of information that must be shared among several agencies continues to rise, and the government can afford neither the personnel resources nor the time delays required for multiple re-entry of data. Both data and applications need to be shared in the most efficient manner, which drives the new interoperability standards.

3. Enhanced Microcomputers

Increased microcomputer computing power is also considered an important factor affecting future system requirements. Increased capabilities would hasten the downsizing of applications to microcomputers over the next five years. The increased power will permit rapid dissemination of printed data through desktop publishing, and reformatting of data bases to provide immediately usable information for managers.

4. Improved Graphics/Imaging

New technologies for graphics and improved imaging are offering enhanced capabilities to agencies to support their information collection and analysis requirements, and advancements in these technologies will improve government agency productivity. The graphics technologies are critical to a wide range of applications, from CAD to data illustrations and desktop publishing. Improved imaging can speed the acquisition and assembly of drawings, photographs, and original documents, among others.

5. Artificial Intelligence

Artificial intelligence—or, more specifically, expert systems—has already been employed in limited applications. New approaches that use AI include software development, process monitoring, and simulation. AI is also being used in tactical situations, automated planning, and support applications throughout DoD. Currently, however, decision support systems represent the most common federal applications for AI. Some examples include photographic analysis for NASA, tax auditing for the IRS, and eligibility verification for Social Security.

6. Advanced Communications

Advancements in communications will also influence government spending for information services. Some agencies will be acquiring newer technology through the FTS 2000 system. In other cases, agencies are planning their own upgraded telecommunications systems that will provide greater ability to handle voice and data communications in an efficient and cost-saving manner.

C
Issues

The fundamental issue for the federal government sector is substantially improved productivity per person and per computing machine. Related to this are the issues discussed below and outlined in Exhibit II-3.

EXHIBIT II-3

Federal Government Sector
Key Agency Issues

- Planning and management
- Security and privacy
- Resource utilization
- Staff shortages
- Cost containment
- Micromanagement

1. Planning and Management

The management transition between administrations needed to pursue government opportunities has not yet been completed. The congressional appointment review process and pay caps discourage many business executives from accepting government posts. In addition, congressional and industry concerns about information resource management (IRM) leadership focus on the need for balance of technical, contractual, and political aptitude. Few IRMs are considered practitioners in all three areas. Some do not appear able to involve senior administrative officials in the decision process. The supply of qualified candidates seems to be shrinking. GSA initiated the TRAIL BOSS program to help selected government program managers overcome the shortage of qualified IRMs and procurement officials in the near term. OPM (Office of Personnel Management) has been pressured to create a professional classification of contract officers.

2. Resource Utilization

Government personnel and managers requiring data processing support through end-user computing need dynamic response from data centers. Both volume and complexity of data processing are increasing, along with demands for more user friendly computing support. The need to share data under the constraints of the Amended Paperwork Reduction Act and to interact to meet administration requirements—including the Reform '88 successor initiatives, CALS and SDI—will require substantially improved connectivity. New standards need to be imposed for uniform protocols, open system architectures, and standard systems interconnections. However, some resistance continues, especially to GOSIP, as some agencies seek to retain their TCP/IP protocol systems.

3. Cost Containment

Cost containment will be a key issue for the government agencies, due to congressional pressures and the continuing slowdown in R&D expenditures. Defense in particular has sustained significant budget cuts. Many small vendors with federal contracts experienced a reduction in profits. Also, to keep costs within the government's control, competitors are now required or encouraged to submit fixed-price bids on most projects and for federal supply schedules.

4. Security and Privacy

Administrative and congressional demands for improved security measures raise both national security and individual privacy protection issues. Congress is also considering new computer theft and proprietary data protection measures, which will affect both commercial and individual

privacy as well as national security. However, the consensus of agency respondents is that something drastic will need to happen before IS security is properly funded by Congress or the administration.

5. Staff Shortages

The federal government does not currently have the in-house staff required to support the quality or quantity of services demanded by Congress and by the American public. The agencies' personnel policies contain outdated standards and job descriptions and impose severe administrative problems. Currently, agencies are working with the Office of Personnel Management to upgrade the skills of procurement professionals, give greater support for contracting personnel, and improve salary levels for effective hiring and retention of qualified government professionals.

6. Micromanagement

The imposition of the mini-Brooks Bill in the Paperwork Reduction Act, and changes in the 1987 reauthorization of the act, did not limit congressional micromanagement of major IRM projects. Recent examples include the changes in the FTS 2000 competition to provide for two contractors, opposition to the plans of SSA in the Systems Management Program, and funding restrictions to the IRS Tax System Redesign. Large defense projects continue to be vulnerable to congressional intervention, fact finding, and insistence on alternatives.

III

Information Systems Environment

III

Information Systems Environment

A
Applications

1. Applications Areas

The federal government sector's priorities for application systems on large-scale and midsized systems are shown in Exhibit III-1. This exhibit is compiled from the descriptions of selected federal information systems and services in INPUT's Procurement Analysis Reports (PARs). The applications are classified as either civilian or defense, and include those from both large-scale and midsized computer systems that are to be acquired, upgraded, or replaced by federal agencies.

The civilian agencies sampled most often designate their large-scale information systems for information analysis, research, and mission support applications. However, these same civilian agencies target management systems, human resources, accounting, and word processing most frequently for midsized operations. Large systems are still employed for applications of a centralized nature. Midrange computers, or minicomputers, play a vital role in the increasingly decentralized and networked environments in governmental user organizations. The federal user community is demanding powerful shared resources that can handle a myriad of department and data center functions.

Information analysis, scientific and engineering support, logistics, and mission support are the most frequent application areas for the defense agencies. For the midsized systems, logistics, word processing, graphics, and electronic mail comprise the largest categories of application areas. Specific technical applications, such as those identified as scientific, constituted a rather small portion of applications run on DoD minicomputers.

Federal agencies (including Army, Navy, DLA, HHS, Interior, and Education) are planning major upgrades of systems for human resources, management, graphics, and logistics and distribution applications. Part of this thrust reflects an increasing awareness by Exhibit III-1.

EXHIBIT III-1

Federal Government Sector—Applications Areas

| Application | Proportion of Agency Respondents (Percent) | | | |
| | Civilian Agencies | | Defense Agencies | |
	Large-Scale Systems	Midsize Systems	Large-Scale Systems	Midsize Systems
Information analysis	18	6	11	8
Research	18	—	5	—
Mission support	14	—	7	—
Logistics and distribution	4	—	16	12
Budget and finance	11	—	12	—
Scientific/engineering	10	6	18	4
Project management	6	6	3	4
Administrative	2	9	3	4
Human resources/payroll	2	13	5	4
Word processing	—	13	—	16
Electronic mail	—	9	—	12
Electronic publishing	—	9	—	8
Graphics	—	—	—	12
Accounting	—	13	7	8
Management systems	—	16	5	8
Distributed processing	4	—	5	—
Planning	2	—	3	—
Training	—	—	—	—
Other	9	—	—	—
Total	100	100	100	100

Data based on surveys conducted for INPUT's FISSP reports during 1989

agency executives of the uses for their information. This is particularly true in the area of logistics. A significant portion of defense agency system upgrades focuses on existing systems that are to be upgraded through the CALS (Computer-aided Acquisition and Logistics Systems) initiative rather than through acquiring new systems.

Replacement of systems is most noted in office automation, information analysis, and scientific/engineering applications, where rapidly changing hardware technology continues to obsolete these systems rapidly. Some agencies have planned for new starts in the traditional areas of information analysis and administration. In general, these programs represent attempts to bring computer-based productivity improvements to the functional operations of the agency.

2. Applications Downsizing

Another trend in federal government applications is downsizing larger system applications to microcomputers. The applications mentioned most frequently by federal agencies are identified in Exhibit III-2.

EXHIBIT III-2

Applications Downsized to Microcomputers	
Application	Rank*
Accounting	1
Inventory	2
Financial	3
Management systems	4
Data entry	5
Information processing	6

* Rank based on frequency of mention in survey for INPUT's federal microcomputer market report.

Accounting and inventory applications are cited most often, followed by other financial applications. This downsizing results from the federal agencies' increased reliance on commercially available spreadsheet packages geared to microcomputers. Management systems are also mentioned. Some agencies supplement their mainframe management systems, while other agencies offload parts of the system to micros. In addition, general data entry and information processing (mission-oriented systems) are

being downsized by agencies. As more powerful systems (386- and even 486-chip technology) are acquired, the downsizing trend will likely accelerate. However, if the process is not properly managed, interoperability demands will likely suffer.

3. New Applications

The volume of transactions and complexity of operations within the federal government sector require a constantly changing focus, as managers with an existing set of applications seek to apply new technological developments to a wide range of information service problems. (See Exhibit III-3.)

EXHIBIT III-3

Federal Government Sector
New Applications

- EDI—networks and services
- Computer-aided Acquisition and Logistics Systems (CALS)
- Automated tax processing
- Standardized financial, payroll, and personnel systems
- AI applied to software development and simulation modeling

Electronic data interchange (EDI) is an important emerging application for accelerating the interchange of procurement, logistics, and other data, while improving the accuracy of these transactions. Currently, federal EDI is lagging behind the explosive growth of commercial EDI. With the exception of a few major programs, most EDI initiatives tend to be small pilot systems in which both government and vendors can assess costs. The recent awards for EDGAR at SEC and GSA's invoicing system may be changing this situation.

The CALS initiative of the Defense Department and NASA is a new application of logistics automation to accomplish several goals:

- Integrate data life cycle elements in a source-to-use network

- Ensure compatibility of data interchange among logistic systems

- Automate the acquisition elements of:

  - Stock order processing
  - Shipping document generation and handling
  - Inventory analysis
  - Technical order (repair) system
  - On-demand authorization of technical manual and documentation generation

- Demonstrate the initial design characteristics and criteria via selected projects

- Involve industry and government in implementation and utilization of the systems

Automated tax processing applications are being developed on several fronts:

- Internal automation at the IRS Regional Centers, providing enhanced capabilities for:

  - Rapid conversion of tax forms to electronic form
  - On-line retention of several years' returns
  - Automated analyses to select returns that need detailed auditing (rather than sampling methods)
  - Automated preparation of refund payments

- External automation of the tax return process, allowing:

  - Electronic filing of individual returns
  - Electronic filing of small business returns involving more forms
  - Electronic fund transfers for tax payment and refunds

After a succession of GAO (General Accounting Office) audits that identified increasing incompatibility and decreasing accuracy of financial, payroll, and personnel systems, OMB has directed conversion or replacement of these systems by all agencies.

- Financial systems must meet a single set of standards and produce compatible products by 1992 (the Joint Federal Management Improvement Program is playing a major role).

- Payroll systems must meet new accuracy and timeliness standards and must be compatible within military and civilian agencies by 1990.

- Personnel systems must be upgraded to meet all of the EEO and privacy protection criteria by the early 1990s.

Artificial intelligence/expert systems applications are moving to near-term implementation and availability in several areas. The Department of Defense has several pilot projects and initial programs under way in which AI provides assistance to human control functions. AI is also being employed to develop models for a number of applications, including the automated tax audit system, gaming for military training simulators, and automated logistics processes. Furthermore, AI is being tested for use in development of applications software, to include automated documentation generation and selection of alternatives that minimize future maintenance problems. However, surveys show that decision support systems, in a variety of administrative and scientific environments, continue to be the primary use of AI in the government.

B
IS Issues

The changing environment of the information services market arises from several issues that strongly influence the suppliers and end users in the federal market sector. The issues listed in Exhibit III-4 will apply throughout the 1990s.

1. Data-to-Information Transition

For several years, the government has been making a transition from merely processing data to becoming more information oriented. The federal agencies need to be able to readily access, exchange, and store the enormous amount of information that is essential to their operations and to the public.

EXHIBIT III-4

Federal Government Sector Information Services Issues

- Transition from data orientation
- Changing acquisition methods
- Implications of standards
- Shake-out of markets
- Price versus technology

2. Changing Acquisition Methods

Another evolutionary process in the government is its method of acquiring information systems and services. The emphasis on cost and risk containment has caused a migration to fixed-price contracts and closer scrutiny of procurements. Insistence on increased competition has led to more protests and longer delays. DoD and others are now pressing for initiation of commercial buying practices.

3. Implications of Standards

The 1990s will be a time for implementing several industry standards for interoperability and compatibility. Transition to POSIX and GOSIP should be progressing, since these standards will be made mandatory. Also, further standardization is likely in the areas of communication protocols and system interfaces.

4. Shake-out of Markets

The industry will continue to experience market shake-outs, brought about by a continued consolidation of players and new entrants, and open competition introduced by the Competition in Contracting Act (CICA). Congressional demands that the market be opened to an increasing number of vendors, particularly small businesses, in the midst of budget-cutting measures, poses threats to established federal vendors and weakens the reliance of agencies on known-quality vendors.

5. Price versus Technology

The federal government often states its preference for awarding contracts based solely on the appropriateness of the proposed technical solution. However, in the agencies' struggle to adhere to constrained budgets while satisfying congressional oversight demands, awards for information services are more frequently made according to price rather than technology. Furthermore, budget limitations hinder modernization and upgrades of information systems. This prevents many agencies from realizing the advantages of new technological capabilities that are needed to take them into the next decade.

C

Impact of New Technologies

Technological factors that would alter the federal government's IS spending were discussed earlier in Section II, and are listed in Exhibit III-5.

EXHIBIT III-5

Federal Government Sector
New Technology IS Impact

- Expanded networks/LANs
- Operating systems advancements
- Increased microcomputer capabilities
- Improved imaging/graphics
- Artificial intelligence developments
- Communications advancements

1. Expanded Networks

The federal government is expanding its computer networks and use of local-area networks (LANs). Agency LAN applications already include administration, project management, data bases, and finance. Over the next few years, mission support and personnel functions will also migrate to LANs to distribute information among various user groups.

2. Operating Systems Advancements

Operating systems advancements will support the interoperability needs of most agencies. These improvements will include performance monitors, documentation generators, self-healing diagnostics, network optimization, multitasking, and multiple language interchange.

3. Increased Microcomputer Capabilities

Increased computing power of microcomputers is also considered an important factor affecting future system requirements. Increased capabilities would hasten the downsizing of applications to microcomputers over the next five years.

4. Improved Imaging and Graphics

New technologies for graphics and improved imaging are offering enhanced capabilities to agencies to support their information collection and analysis requirements. Advancements in these technologies will improve productivity at government agencies by minimizing or eliminating the need for multiple rekeying of information.

5. Artificial Intelligence Developments

Artificial intelligence, or more specifically, expert systems, have already been employed in limited applications. New approaches that use AI include software development, process monitoring, and simulation. AI is also being used in tactical situations, automated planning, and support applications throughout DoD. However, decision support systems currently represent the most common federal applications for AI. Some examples include photographic analysis for NASA, tax auditing for IRS, and eligibility verification for Social Security.

6. Communications Advancements

Advancements in communications will also influence government spending for information services. Some agencies will be acquiring newer technology through the FTS 2000 system. In other cases, agencies are planning their own upgraded network systems with ability to handle voice and data communications in a secure, efficient, and cost-saving manner. Fiber optics, optical computers and switches, and a number of electronic enhancements will impact IS/communications operations and management.

D
Information Technology Budget

The annual information systems (IS—referred to as information technology in the federal government) budget that supports the various federal department missions is categorized by the OMB A-11 Budget Process in terms of the basic components needed to acquire and operate IS—capital investments, commercial services, operating support, and personnel. These categories and their respective shares of the 1992 (IS) Information Technology Budget request (software, services, hardware, and systems) are displayed in Exhibit III-6. It should be noted that some programs are industrially funded and therefore are not included in the A-11 submissions.

For fiscal year 1992, 71% of the budget is proposed for expenditure on contracts for systems and services—about the same as was proposed in fiscal year 1991.

EXHIBIT III-6

Information Technology Budget—FY 1992

Obligations - $24.6 billion
Contracts - $17.8 billion (71%)

- All of the budget for the commercial services segment will be spent on contracts for telecommunications and network services, processing, maintenance, and professional services. This amount is $680 million higher than in fiscal year 1991.

- Ninety-four percent of the proposed budget for the capital investment segment will be spent on ADP and communications hardware and software.

- Operating costs, which include equipment leases, are expected to increase from 8% of the budget last year to 9% in fiscal year 1992.

- Personnel costs for in-house staff, travel, etc. are projected to be 2% less than in fiscal year 1991. Because the base is higher, this would be an increase of about $276 million.

This is a summation and analysis of the executive branch agencies' budget submitted under OMB Circular A-11, Section 43, including revisions through April 1991. Since then, a number of events have occurred, as noted in Section II, that severely impacted the budget request—including a deepening federal deficit, costs of Operations Desert Shield and Desert Storm, the government's share of health care costs, cessation of the Cold War, and desired reduction of defense costs.

The introduction of the Defense Corporate Information Management (CIM) Initiative resulted in endorsement of a $1 billion O&M program that replaces $588.5 million of Army, $384.5 million of Navy, $503.5 million of Air Force and $162.7 million of Defense Agency budgets. The CIM is expected to save up to $4 billion of automated data processing resources for DoD through fiscal year 1995. In late 1991 and 1992, the CIM operation is releasing a substantial amount of funding to replace deteriorating systems and upgrade some critical systems. This one-time expenditure could reach about $1.3 billion, if approved by Congress.

Additional reductions in civil agency budgets, unresolved at the printing of this report, will be estimated in Section IV, on the IT market. IT areas that were targets of congressional budget authority objections include NASA, Treasury, Commerce, FAA, and Social Security. Additional reductions of the defense IT budget were imposed by cuts in weapons and platform procurement deletions. This reduction is not specific as of this writing, and is therefore applied across all delivery modes.

E

IS/IT Objectives

The IS/IT objectives of the federal government sector are shown in Exhibit III-7.

EXHIBIT III-7

Federal Government Sector Objectives

- Voice-data integration
- Improved end-user support
- Increased software product applications
- Relational data bases
- Departmental information processing
- Transparent connectivity
- Decision support systems

1. Voice-Data Integration

Integration of voice, image, text, and data interchange within a single digital system is a key objective of GSA's FTS 2000 telecommunications project being implemented in the 1990s. An all-digital system would more readily permit encryption for security reasons and allow use of more cost-effective fiber optic transmission methods.

2. Improved End-User Support

Improved, user friendly data processing resources are key objectives of most current systems projects. A primary objective is improved data base availability, with appropriate security controls that respond to end-user needs. Vendors to the federal market are becoming more aware of government users' need to readily access data and distribute information among agency sites.

3. Increased Software Product Applications

GAO, GSA, and NBS are pressing agencies to employ off-the-shelf or readily adaptable software products for a wide range of government applications that closely resemble commercial processes. Objectives include:

- Reduced time and cost of software development
- Improved maintainability of software
- Improved transportability of applications between processors

4. Relational Data Bases

There is increasing pressure for installation of relational data bases equipped with SQL to meet the data retrieval requirement of a widening community of end users, which may also include the public. Agencies have started to acquire 4GL packages as one means of offloading requests for ADP staff time.

The general concerns of potential government users of 4GLs are programmer productivity gains (during both the development phase and the maintenance cycle), performance and hardware resource considerations, and management issues. Frequently, the use of 4GLs, though improving programmer productivity, imposes an unacceptable burden on machine resources. However, with the trend toward downsizing to more powerful microcomputers, this burden is mitigated.

5. Departmental Information Processing

IS departmental processing emphasizes improvement of services to end users, with purchased software products, improved and timely data bases, and technical support. Many of the federal government's midsized systems or department minicomputers are playing a vital role in the increasingly decentralized and networked environment of federal user organizations. The federal user community is demanding more-powerful computer resources that can handle the departmental and data center functions and can also be adapted to a distributed network environment.

6. Interconnectivity

Ultimately, current federal initiatives seek implementation of systems with a high degree of interconnectivity to users. Federal agencies are aiming for greater interoperability and connectivity throughout their information systems. The current obstacles to early achievement are less related to technology, than to management opposition and privacy protection.

7. Decision Support Systems

One additional IS/IT objective of the federal government sector is the implementation of interface devices between office automation equipment and centralized data bases and other files. These will provide decision support systems to government executives, and are driving the growth of LANs in federal offices. Also, developmental artificial intelligence efforts are incorporating new technologies that provide decision aids to improve productivity. Most of the delays encountered in producing responses to congressional queries and the general public result from the lack of appropriate and rapid data access by agency personnel.

IV

Information Services Market

IV

Information Services Market

This chapter discusses the markets for information services and information technology in the federal government services sector. Information in this chapter draws on the data presented in Chapter I and the trends and issues discussed in Chapters II and III to outline the anticipated future directions of the markets. A discussion and set of assumptions about the 1990-1995 expenditures concern anticipated declines in the growth rates of this market sector.

Agency/user expenditure forecasts are provided for the federal government sector by delivery mode. Major segment users are indicated. Assumptions driving the forecasts from the initial agency IS/IT budget requests are presented.

Section A, Overview, discusses the overall size and growth rate of the federal government's outside expenditures for information services.

Section B, Delivery Mode Analysis, breaks out the overall data into INPUT's seven standard delivery modes.

A
Overview

INPUT dissociates the federal IS/IT budget elements and recombines them into more convenient industry terms. The first perspective provides a picture of that portion of the budget spent on contracts for goods and services. The second perspective deletes those portions of the budget forecasted for hardware, telecommunications, systems software, and cross-industry expenditures. The resulting federal government information services market as defined by INPUT is illustrated in Exhibit IV-1. In the rest of this subsection, INPUT provides forecasts and discussion of the individual delivery modes defined in the separate volume, Appendix A to the Market Analysis Program Sector Reports.

EXHIBIT IV-1

**Federal Government Sector
Information Services Market, 1991-1996**

The overall budget requested for federal acquisition of IT is expected to reach $9.5 billion in 1991. INPUT forecasts that the overall market could increase at a compound annual growth rate (CAGR) of 12%, to reach $16.5 billion in 1996. This growth rate is based on current economic indicators, including forecasted GNP, federal budget, and inflation factors of early 1991.

Several economic and political factors have already and can further reduce the IS growth rate, moderately to significantly. The budget package passed by the 101st Congress before adjournment included cuts across all agencies, in addition to the net reductions of $656 million of Defense IS expenditures under the CIM Initiative. There is still the prospect of automatic imposition of the Gramm-Rudman-Hollings Act cuts across all agencies if tax revenues fall below projections.

The Defense CIM initiative is expected to reduce IS spending by almost $4 billion between 1991 and 1995, and this has been factored into INPUT's forecast in Exhibit IV-1. Cuts in civil agency programs have also been projected, including potential slowdown of spending on NASA projects, tax systems modernization, and delays in the FAA Automation Program.

Changes also occurred in the actual spending rates for 1991, as the economy cooled down mid-year. It was expected that several large programs would be halted pending re-evaluation of requirements, several more delayed pending improvement of already installed elements, and some programs cancelled. However, several large contracts were awarded and the 1991 base is about $600 million higher than forecasted in 1990, with significant increases in outlays for systems integration and systems operations, offset slightly by a decrease in applications software and turnkey systems.

Exhibit IV-2 presents a summary of the forecasts for user-agency expenditures by delivery mode. Applications software is the fastest growing mode, now up from the 12% CAGR of 1990 to 20%. Systems integration was leading in 1990, but is now showing a 16% CAGR through 1996, for the reasons cited above. Systems operations, which includes both processing services (called COCO—contractor-owned, contractor operated) and professional services (called GOCO—government-owned, contractor operated) slightly declined to a 10% CAGR, still higher than it has been in more than a decade. Network services is expected to drop from its 1990 growth rate of 8%, while professional services improves from 4% last year to 7% CAGR, as discussed earlier.

In 1991 and 1996, the largest delivery mode is systems integration, rising from 35% to 42% of all IS expenditures. As expected, professional services is the second largest delivery mode, but it will decrease to 17% of 1996 outlays, as emphasis shifts to packaged software, systems integration, and systems operations.

B

Delivery Mode Analysis

1. Processing Services

Processing services includes transaction processing with some batch mode workloads. For the last half of the 1980s, this delivery mode declined as installation of new systems and PCs depressed the need for outside processing support. Exhibit IV-3 shows the minimum real growth of transaction processing.

EXHIBIT IV-2

Federal Government Sector—Information Services Market by Delivery Mode, 1991-1996

Delivery Mode	1991	1996	CAGR (Percent)
Systems Integration	3,322	6,897	16
Professional Services	1,900	2,700	7
Systems Operations	1,686	2,593	9
Network Services	1,234	1,825	8
Turnkey Systems	612	938	9
Applications Software	520	1,316	20
Processing Services	187	220	3

User Agency Expenditures
($ Millions)

Legend: 1991, 1996

EXHIBIT IV-3

Processing Services Market

The demand for services under GSA's Teleprocessing Services Program fell from $80 million in 1983 to $26 million in 1989, leading to cancellation of the program by GSA in September 1990.

Future transaction processing requirements must be procured through RFPs, which may require processing requests to GSA for a DPA (Delegation of Procurement Authority). The communications must be acquired through FTS 2000, in a separate action by the agency.

A small amount of batch processing continues to appear in agency IT expenditures, but has declined to about $30 million per year. The bulk of this work appears in the Education Department and Defense.

2. Network Services

The federal market demand for network services will increase from $1.1 billion in 1991 to $1.8 billion in 1996 at an 8% CAGR through the five-year forecast period, as shown in Exhibit IV-4.

Network Services Market

CAGR (Percent)

Total: 1,234 (1991), 1,825 (1996)	8
Network Applications: 900 (1991), 1,385 (1996)	9
Electronic Information Services: 334 (1991), 440 (1996)	6

Legend: ▩ 1991 ▨ 1996

User Expenditures ($ Millions) — 0, 500, 1000, 1500, 2000

Both defense and civilian agencies have planned major initiatives for implementation over the next five years. Revisions of agency policies and new standards that are being developed and implemented are impacting these future acquisitions and will serve as controlling criteria for network services.

Agency network service contracts typically last seven to ten years and will not be terminated due to budget constraints. Separate new and replacement network acquisitions, however, may be deferred if agencies can meet their requirements through FTS 2000.

Some other factors that will drive the market include the following:

• Agencies are becoming more demanding and sophisticated in their network services requirements, either riding FTS 2000 or, when appropriate, initiating their own requirements-type contracts.

• Technological advances will change the market character. For example, as better network management tools become available, agencies will come to expect the resulting economy and efficiency.

• As with most other federal market segments, competition will become more intense. Since this market still shows some of the vestiges of monopoly, the increase in competition will be even more dramatic.

- Communications security requirements will likely increase as a result of the Computer Security Act of 1988, as well as other forces.

Despite the impact of the budget package and potential implementation of the Gramm-Rudman-Hollings Act, INPUT believes that the effects of budget constraints will be mitigated somewhat in the federal network services segment. Budget reductions actually may increase federal dependence on these services. Teleconferencing and electronic message distribution will be emphasized to reduce travel and other costs.

3. Applications Software

Applications software outlays are driven by the large PC inventory and updates of existing mainframe suites. Acquisition of more efficient software for workstations/PCs is a key factor in the CAGR of 20% for the applications software market, up from 12% in 1990, as shown in Exhibit IV-5.

EXHIBIT IV-5

Applications Software Market

CAGR (Percent)

Category	1991	1996	CAGR (Percent)
Total	520	1,316	20
Workstation/PC	260	895	28
Minicomputer	150	270	12
Mainframe	110	151	7

User Expenditures ($ Millions)

One area receiving much attention is standard financial packages. The Joint Financial Management Improvement Program (JFMIP) issued a Core Financial System Requirements document for agency use. In connection

with the JFMIP requirement, GSA issued contracts for certain core-compliant software. INPUT expects several additional vendors to be approved for core-compliant software.

Beta testing of packages by agencies leads to bid solicitations for specific types of platforms under the QPL (Qualified Products List) procurement ground rules. This is particularly pertinent in requirements (indefinite-quantity, indefinite-schedule)-type contracts.

Two areas of vendor concern are the availability of government software for use by other agencies at minimal cost, and constraints on commercial-ization of federal software under existing copyright laws. Three federal centers—NTIS, National Energy Software Center, and NASA's COSMIC (Computer Software Management and Information Center)—catalog tapes, disks, and documentation of federally generated and federally funded software for use by other agencies. Commercially available software is not included.

4. Turnkey Systems

Exhibit IV-6 shows higher growth of a 6% CAGR for turnkey systems over the 1990 forecast. Scientific and engineering applications represent the largest area of agency turnkey system use. These include CAD, CAM, CIM, and data collection packages. On the civilian side, Commerce, NASA and Energy have the greatest need for these systems and support most of the civilian growth. Defense also has growing requirements in this area.

Document handling represents the second largest application area. This includes, among other applications, DoD's initiatives on CALS (Computer-aided Acquisition and Logistics Systems). Other document-handling applications of interest to federal agencies include library, graphics, mapping, and publishing systems.

Turnkey systems being procured by federal agencies include custom design and applications. The vendor provides the entire system, including applications software and special peripherals. Also, vendors install the system, train client personnel to operate it, and provide service during the warranty period.

EXHIBIT IV-6

Turnkey Systems Market

Category	1991	1996	CAGR (Percent)
Total	612	938	9
Equipment	282	385	6
Software	226	347	9
Professional Services	104	206	15

User Expenditures ($ Millions)

5. Systems Integration

The market for systems integration is expected to grow at a compound annual growth rate of 16%, from $3.3 billion in 1991 to $6.9 billion in 1996, as indicated in Exhibit IV-7. Earlier growth in the federal systems integration market was rapid due to the government's focus on upgrading its in-house information resources. Current forecasts show a reduction in growth, but a significant increase in 1992 will improve market strength. The professional services component of the systems integration forecast shows the largest growth, as agencies modernize and acquire additional systems. The equipment portion continues at a lower rate, reflecting sizable budget cuts at many agencies, especially on the defense side.

The overall growth rate of this market declined from the 1988 prediction of 18% to 13% in 1990, largely as a result of the budget squeeze induced by the rising deficit, reduction in defense spending including CIM, and delays in approval for large systems in Defense, IRS, Commerce and NASA. The prospects for a continuing market look good, but the number of active vendors is likely to decrease as the competition becomes heated.

Civilian SI spending exceeds that of the Defense Department by more than half a billion dollars. This reflects budget constraints in the Defense Department. Under CIM, no major SI initiatives are being cancelled; some may be deferred or stretched out. As a result, the defense market will not surpass the civilian market demand in the next five years.

Most SI projects include provisions for communications. With the advent of FTS 2000, cost estimating has become difficult in the absence of firm rate data from the two FTS 2000 contractors, AT&T and Sprint. Some PC-based costing models are available in the private sector, but they lack the confirmation of GSA and the carriers. GSA is now promising to provide rate data to agencies on their FTS 2000 connection, for sharing with the SI contractor.

EXHIBIT IV-7

Systems Integration Market

	1991	1996	CAGR (Percent)
Total	3,322	6,897	16
Professional Services	1,384	2,975	16
Equipment	1,581	3,056	14
Software Products	219	526	19
Other	138	340	20

User Expenditures ($ Millions)

The prospects for post-implementation support are increasing rapidly. Delays in approval of funding, implementation, and cut-over are leading to obsolescence of existing ADP equipment and the incumbent federal ADP staff, and lessened opportunities for training them on new systems.

6. Professional Services

Professional services now include consulting, education and training, and software development. This segment does not include the professional services associated with systems integration, systems operations and network services. The federal professional services market is projected to increase from $1.9 billion in 1991 to $2.7 billion in 1996, as indicated in Exhibit IV-8. The projected CAGR of 7% is more than the 4% CAGR of 1990, but is still a significant drop from the 13% forecasted in 1988.

EXHIBIT IV-8

Professional Services Market

		CAGR (Percent)
Total	1,900 (1991) / 2,700 (1996)	7
System Development	1,200 (1991) / 1,900 (1996)	9
Design and Consulting	400 (1991) / 500 (1996)	5
Education and Training	300 (1991) / 300 (1996)	0

Legend: ▨ 1991   ▨ 1996

User Expenditures ($ Millions) — axis: 0, 1000, 2000, 3000

The projected need for contractor assistance makes the federal government the largest user group for professional services in the U.S. The declining availability of programming skills in the federal government is the most significant factor behind the projected growth. Government staffing limits and the backlog of software maintenance tasks at most government data centers also contribute to the demand for vendor assistance in this delivery mode.

The no-growth demand guideline for consulting and design services applies to agencies' need for assistance in producing the technical justification of planning improvements in information technology resources during this period. Agencies are understaffed in the technical planning and evaluation areas. This market will continue to be affected by congressional pressure on agencies to minimize or eliminate entirely the use of outsiders (and ex-government employees) in functions perceived as governmental management.

The education and training submode continues to erode under budget pressures and because training is provided as part of systems integration programs. The forecast is a negative 4% CAGR from 1990 to 1995. Computer training is being provided in-house by a number of larger agencies under their regular administrative budgets. These courses for end-user computing, local-area networks, distributed processing, and new software tools will be generated by industry, but not conducted by industry.

7. Systems Operations

Beginning in 1989, INPUT combined the earlier facilities management submodes of processing and professional services. This market is now a key part of outsourcing. As noted in Exhibit IV-9, federal systems operations expenditures are $1.5 billion in 1991, and expected to grow at a CAGR of 10% to reach $2.5 billion in 1996. This growth rate has slowed from the 15% predicted in 1989.

There are significant changes in the processing services submode of systems operations, also known as COCO (contractor-owned, contractor-operated) in federal circles. It sustained a no-growth level of about $200 million from 1984 to 1988. With the imposition of budget cuts under Gramm-Rudman, a number of urgently needed ADP system replacements were delayed, and agencies turned to COCO vendors for temporary support. Prospects continue to improve, with projects like FAA's CORN (Computer Resources Nucleus), which is projected to cost about $1.5 billion over 10 years. The SEC EDGAR project is already underway, leading the way toward increased use of contractor facilities to provide flexibility with few capital investment requirements and related approval procedures. Continued budget deficit reduction measures could lead to a much stronger market than is currently predicted.

Professional services systems operations (PSSO) is also referred to as government-owned/contractor-operated (GOCO). Some agencies and vendors still call this facilities management (FM), while commercial customers now use the term outsourcing to describe it. The computing equipment is owned or leased by the government, not the PSSO or O&M vendor, and the vendor provides the staff to operate, maintain, and manage the government's facility.

EXHIBIT IV-9

Systems Operations Market

	CAGR (Percent)
Total — 1,686 / 2,593	9
Applications Systems Operations — 1,024 / 1,575	9
Platform Systems Operations — 662 / 1,018	9

Legend: ▨ 1991   ▧ 1996

User Expenditures ($ Millions)
0   1000   2000   3000

Although industry has used the methodology for years, NASA was the first federal agency to employ mission contracting, now used at all centers except Lewis. The Air Force also uses the same type of contracts for a few centers, and other agencies are moving toward allowing the contractor to use the most efficient mix to meet mission data processing and communications requirements.

In addition to winning a five-year contract, the vendor gains the opportunity to provide software and hardware add-ons during the contract term. This process is called flow-through and enables the incumbent vendor to improve profitability in a delivery mode (GOCO) associated with low fee rates.

Vendors not involved in or allied with another vendor for SI may experience greater competition for the post-SI implementation support. A number of professional services firms are attracted to SI contracts because of SO prospects in the following five to ten years.

V

Competitive Environment

V

Competitive Environment

This chapter discusses the competitive environment for information services within the federal government sector. Leading vendors in each delivery mode are identified and the key players profiled. As many as 450 IS vendors participate in the sector, but are too numerous and diverse to mention in this overview. Further, competitors overlap several delivery modes, some actually appearing in the list of contractors for all modes.

A

Leading Federal Vendors

In general, the leading players do not change much from year to year, although the rank does change, and some disappear by name through acquisitions. It has become increasingly difficult for firms outside the IS sector to gain a significant edge, or for newer firms to improve their share of the IS market.

1. Processing Services

The federal government market for processing services has been flat over the past few years, as the users changed organizationally, technologically and strategically. The trend downward was fueled by the increasing availability of microcomputers to support end-user computing. The heaviest user of processing services was the Defense Department, the last of the federal agencies and departments to gain funding for sorely needed new IS. The current requirements for external file access, value-added services and software program downloading represent opportunities for vendors, but offers no real ROI for newcomers.

The leading processing services vendors in this market for calendar year 1989 are listed in Exhibit V-1. The market has been concentrated, with only a few vendors accounting for most of the user expenditures, as a result of GSA programs like the TSP (Teleprocessing Services Program) and its predecessor, NTS (National Teleprocessing Services). The market continues to experience consolidation as the leaders acquire smaller vendors and their contracts.

EXHIBIT V-1

**Leading Federal
Processing Services Vendors**

- Computer Sciences Corporation
- Boeing Computer Services
- Martin Marietta Data Systems
- Control Data Corporation
- Dialcom

Source: GSA-TSP Report and
Federal Procurement Data Center

Even in the presence of the federally mandated TSP, there was always a
fair percentage of contracts awarded by conventional contracting channels.
With termination of the MASC (Multiple Award Scheduled Contracts)-
driven TSP effective September 30, 1990, all services must be acquired
through conventional RFPs, except communications, which must be
separately acquired by the user. Most of these will be provided through
FTS 2000.

2. Network Electronic Information Services

Most of the leading network services vendors listed in Exhibit V-2 have
accounted for 75% of the market. As a result of the award of FTS 2000 to
AT&T (60%) and U.S. Sprint (40%), these two carriers will provide most
of the media and support for network services. Several of the other lead-
ing vendors are also providing electronic information services.

EXHIBIT V-2

**Leading Federal
Network Services Vendors**

• AT&T	• General Electric
• BBN	• GTE
• Bell Atlantic	• Southwestern Bell
• Boeing Computer Services	• U.S. Sprint
• Contel	• U.S. West

The list of vendors is changing, even as this report is being written. GTE and Contel are merging, and BCS is changing the type of services it offers. Telenet and Booz Allen are increasing market shares through awards made in 1990. Vendors offering specialized capabilities in EDI and videotex are expected to gain increasing shares of this market.

3. Applications Software

Applications software products are now overtaking turnkey systems in market share and are growing even faster than systems integration. The market is also the least concentrated at this time, with the leading firms listed in Exhibit V-3 accounting for only part of the market. This delivery mode does not include typical cross-industry applications.

EXHIBIT V-3

**Leading Federal
Applications Software Vendors**

- Candle Corporation
- Computer Associates
- Computer Corporation of America
- Computer Data Systems, Inc.
- Government Technology Services, Inc.
- Integrated Software Systems
- MacNeal-Schwendler Corporation
- QS, Inc.
- Sterling Software
- Universal Energy Systems

Exhibit V-3 is based on the Federal Procurement Data Center listing of applications software suppliers. Please note that some suppliers are not software developers, but instead supply products from firms like Ashton-Tate, Berkeley Software, Broderbund, Lotus, Microsoft, and others under discounted GSA Federal Supply Schedules.

Federal agency users buy about 40% of their software and lease the rest. GSA and DoD emphasize software maintenance more than do other agencies. Some agencies oppose acquisition of copyright-protected software.

4. Turnkey Systems

The federal government turnkey systems market is usually associated with specialized applications in particular niche areas and is, therefore, considerably smaller than the systems integration market. The leading vendors shown in Exhibit V-4 are smaller firms that focus on specific government requirements. Some specialize in defense needs, but practically all provide adapted equipment, modified to satisfy specific requirements.

Some vendors focus on a handful of agencies, providing CAD/CAM products. Graphics and drawing control applications apply to a wide range of agencies, along with maintenance and vehicle scheduling systems. Packaged simulators have been focused on defense and NASA, but are now being acquired by other agencies with training and demonstration needs.

EXHIBIT V-4

Leading Federal
Turnkey Systems Vendors

- C3, Inc.
- Computer Consoles
- Computervision
- Federal Data Corporation
- Gould
- Harris
- Intergraph, Inc.
- Prime Computers
- Tektronix
- Triad

Source: Federal Procurement Data Center

5. Systems Integration

The size and early growth of the federal systems integration market have attracted fierce competition and the attention of both aerospace and industrial firms. The leading federal vendors in Exhibit V-5 are also well known in other segments of the federal information systems marketplace.

Projects in the federal sector vary from upgrading or expanding relatively recent systems, to integrating standalone (stovepipe) systems, replacing outdated/limited capacity systems, and automating previously all-manual or semi-automatic systems. The range of skills and experience needed to successfully implement many of these systems leads to alliances between leaders and a wide range of key suppliers.

EXHIBIT V-5

Leading Federal Systems Integration Vendors

- Boeing Computer Services
- Centel Federal
- Computer Sciences Corporation
- Electronic Data Systems (General Motors)
- Grumman Data Systems
- IBM
- Martin Marietta
- PRC/ATI (Black and Decker)
- SAIC
- Unisys

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6. Professional Services

Since the federal government is the largest single user of professional services, it attracts the widest range of vendors. As shown in Exhibit V-6, systems houses and hardware firms dominate this market, followed closely by large software and management services firms. As in the systems integration market, virtually all professional services firms team with each other to respond to major federal solicitations.

The availability of experienced project managers and technical specialists is paramount to a winning strategy. Emphasis in choosing a vendor is placed on agency user familiarity which benefits those vendors with successful track records and solid experience. Client-directed use of subcontractors with unique exposure to the client's problems occurs frequently. The Big Six accounting firms and several large software developers are becoming more visible in team bids. Use of and proficiency in software development tools, especially programmer and analyst workbenches, are being sought more often.

EXHIBIT V-6

Leading Federal
Professional Services Firms

- CDSI
- CSC
- EDS (General Motors)
- Grumman Data Systems
- Harris Corporation
- McDonnell Douglas
- PRC (Black & Decker)
- SAIC
- TRW
- Unisys

7. Systems Operations

Although it is a relatively recent phenomenon in commercial sectors, systems operations has been an active market in the federal government sector for 30 years. Earlier, this market was called facilities management and was included under processing services and professional services delivery modes. With the emphasis on outsourcing, the two submodes have been combined under one heading. Several of the leading federal systems operations vendors listed in Exhibit V-7 provide services in both submodes to the agencies.

Professional services systems operations, called GOCO (government-owned, contractor-operated), is the largest portion of the market. NASA and defense laboratories have long used most of the leading vendors to operate large and complex IS installations, mostly because of the widely varying levels of demand for processing services. Winners of these contracts usually absorb the majority of the losing incumbent's employees, replacing only the management team. Contracts usually run for five to ten years, providing a steady stream of revenue for the vendor.

EXHIBIT V-7

Leading Federal Systems Operations Vendors

- Boeing Computer Services
- Computer Sciences Corporation
- Electronic Data Systems
- EGG GmbH
- General Electric
- DP Associates
- Dynatech (Dynalectron)
- Lockheed
- PRC (Black & Decker)
- Unisys

Processing services systems operations, called COCO (contractor-owned, contractor-operated), constitutes the lesser portion of the market. More than a decade ago, many agencies needing a new ADP center to meet newly mandated services employed COCO vendors during the time it took to get a new government center through the acquisition and implementation phases. The current and future markets for processing services systems operations appear to be limited to providing short-term, unique requirement facilities, and operating standby systems for disaster recovery or recurrent overloads. New entrants in this market are not likely to see an adequate ROI, as compared to the longer term competitors.

B

Vendor Profiles

The companies profiled in the remainder of this section are a cross-section of notable vendors in the federal government sector. More details are available in the 1989 MAP Federal Government Sector Report and INPUT's Vendor Analysis Program.

1. American Management Systems, Inc. (AMS), 1777 North Kent Street, Arlington, VA 22209, (703) 841-6000

AMS, founded in 1970, provides professional services, systems integration, applications software, and processing and micrographics services. Since 1982, AMS has focused on financial services firms; federal, state,

and local governments; educational institutions; energy; health care; insurance; manufacturing; retail and wholesale distribution; utilities; and telecommunications. IBM purchased 10% of AMS's stock in 1989. AMS also set up a joint venture for systems integration with Bell Atlantic.

About fifty-five percent of AMS's revenues are derived from government contracts. Professional services provided to civil agencies include LANs, advanced DBMSs, micro-to-mainframe architectures, and expert and decision support systems. Defense agency support included both information systems and non-information engineering, logistics, acquisition, and management projects. In 1987, AMS won a five-year contract with Interior for systems operations of the Minerals Management Service RM Program.

2. BDM International, Inc., subsidiary of Carlyle Group, 7915 Jones Branch Drive, McLean, VA 22102, (703) 848-5000

Established in 1960, BDM provides professional and technical services-including a range of information systems and systems services (integration, engineering, and design)—to clients in defense, civil government, manufacturing, and business and finance in the U.S. and abroad. The majority of BDM's revenue is derived from contracts with the federal government. The ran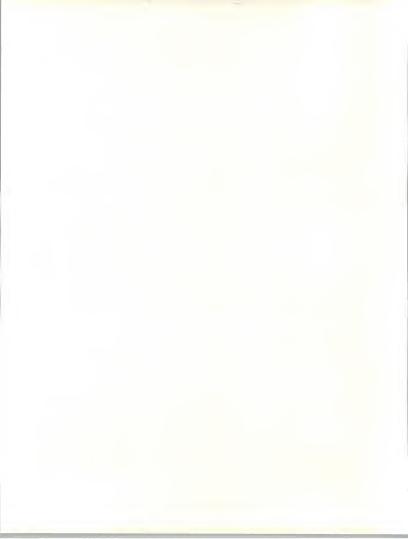ge of applications areas addressed include communications, information management, national security and defense, logistics, space, manufacturing modernization, energy, environment, transportation, training, and advanced technology.

Large-scale software development is a major part of BDM's information systems and systems integration services. BDM's Software Productivity Enhancement Center (SPEC™) concept combines computer-aided software engineering, artificial intelligence, and desktop publishing tools and techniques, enabling rapid production of large quantities of software. The company uses matrix management for its 3,500 employees at more than 50 offices worldwide. The key sites are BDM Technology Centers at McLean, Albuquerque, Dayton, Huntsville, Columbia (MD), Seattle, Los Angeles, Monterey, Boulder, and Norfolk (VA). In July 1988, BDM was acquired by Ford Aerospace Corporation/Ford Motor Corporation, and sold first to Loral and then to the Carlyle Group in 1990.

3. Boeing Computer Services (BCS), 2810 160th Avenue, S.E., Bellevue, WA 98008, (206) 865-5166

BCS, a division of the Boeing Corporation, supplies computing resources and information services to all Boeing operating divisions, and to more than 1,500 government and commercial customers worldwide. In 1988, BCS was realigned to emphasize systems integration of government telecommunications and computer programs. BCS was established in 1970 to consolidate 13 separate computing organizations within Boeing,

and was divided into two major groups: Information Services, to focus on non-captive business, and Boeing Support Group, to support information processing needs of the Boeing Company and its operating divisions. About one-fourth of BCS's employees are involved in non-captive information services activities, of which about 80% is derived from the federal government.

Professional services, systems operations and systems integration, and network design and management accounts for about 85% of BCS's non-captive revenue. Key contracts include technical MIS for NASA Space Station, AFC MIS at Fort McPherson (GA), and systems operations at DOEA-Hanford, MSFC-NASA, Department of Education Information Technology Services, and in partnership with AT&T and CSC for the FTS 2000 (ten-year contract). BCS also provides MAINSTREAM™ processing/network services in a very wide range of software products, and over 250 computer training and management/communications courses.

4. Cincinnati Bell Information Systems, Inc. (CBIS), 600 Vine Street, P.O. Box 1638, Cincinnati, OH 45201, (513) 784-5900

CBIS provides a range of processing services, software products, and professional services to telecommunications companies, large corporations, and federal, civil, and foreign governments. CBIS started at the Information Systems department of Cincinnati Bell Telephone and became a wholly owned subsidiary in 1983. Since then, several acquisitions have increased revenue and expanded product and service offerings:

- 1985 - Creative Management Systems—Call accounting software and processing services, private telecommunication networks

- 1986 - Cellular Business Systems—Software, processing, and professional services

- 1987 - Auxton Computer Enterprise—Professional and processing services and software products

- 1988 - Vanguard Technologies, Inc.—Professional services for the federal government

- 1988 - Computer Communications & Technology—Paging management system

CBIS revenues can be described as follows:

- About 80% of CBIS non-captive information services revenue is derived from the U.S. and 20% from international sources

- Sixty percent of revenue is from the telecommunications industry, 25% from the federal government, and 15% from large corporations and education

- About 60% comes from professional services, 25% from applications software, and 15% from processing services

Federal sector services to agencies and prime contractors include custom applications software, systems operations, systems integration, and integrated logistics support.
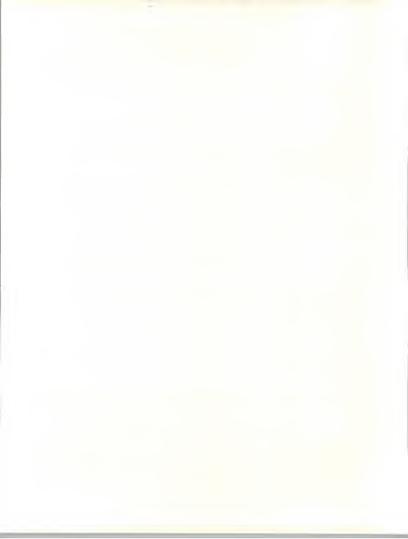
5. Computer Data Systems, Inc. (CDSI), One Curie Court, Rockville, MD 20850, (301) 921-7000

CDSI, founded in 1968, provides professional and processing services, systems integration, financial software products, CASE tools, and turnkey systems, principally to the federal government. Group Operations, Inc. (GOI) was acquired in 1988 to provide COBOL maintenance and restructuring software tools and professional services. About 89% of CDSI revenue comes from federal government contracts, and the remaining 11% from labor and non-profit organizations, trade associations, universities, and commercial clients.

6. Computer Sciences Corporation (CSC), 2100 East Grand Avenue, El Segundo, CA 90245, (213) 615-0311

CSC, founded in 1959, is the largest independent professional services company in the industry. It provides government and commercial clients with management consulting, requirements analysis, software development, systems engineering and integration, turnkey computer communications systems, and systems operations services. The company also provides industry-specific proprietary products and services for credit reporting, claims processing, health maintenance organizations, and income tax preparation. In the past two years, CSC acquired CIG-Intersys Group in Belgium; Seako, Inc., of Birmingham (AL); Index Group, of Cambridge (MA); and Cleveland Consulting. The key divestiture was sale of INFONET, the network services business subsidiary, which includes federal government processing services contracts.

The company provides products and services through three groups. The Systems Group, headquartered in Falls Church (VA), is the primary source for computer and communications technology and primarily serves the federal government sector. Systems Group provides systems engineering and integration, custom-designed computer-based systems, systems operations, and turnkey systems. This group is teamed with AT&T and BCS for the 10-year FTS 2000 contract, with IBM and Raytheon for the

$3.5 billion Advanced Automation System for FAA, and with Pan Am and ECC for systems operations of the Pacific Missile Range Facility. CSC recently won a $347 million contract from EPA for technical and operating support services.

7. Electronic Data Systems (EDS), 7171 Forest Lane, Dallas, TX 75230, (214) 604-6000

EDS, founded in 1962, is a leading information and communications services company, providing information processing, systems operations, and communications services to the financial, insurance, commercial and communications industries domestically and internationally, and to state and federal government. These markets include banking, credit unions, property/life/health/casualty insurance, distributing, manufacturing, transportation, retail, and energy. EDS and its subsidiaries were acquired by General Motors in 1984. EDS has since made at least eight significant acquisitions in the U.S. commercial sector and one in Taiwan.

EDS is organized into five business units, with the Government Systems Group focused on systems integration and systems operation services—ncluding support of state-controlled health care (or Medicaid) programs, and federal, state, and civilian government customers. The GM Business Operations Group provides information services in support of GM's internal organizations (less than 45% of total EDS revenues). In the federal government sector, EDS provides large ongoing systems integration and systems operations services to the Army (ASIMS) and Project 80X, CHAMPUS health care, and SPAR conversion for the Navy. EDS also has a number of contracts to implement LANs, turnkey solutions, and technical support.

8. Grumman Data Systems (GDS), 1111 Stewart Avenue, Bethpage, NY 11714, (516) 682-8500

GDS, organized as a division of Grumman Corporation in 1969, designs, develops, installs, operates, and supports computer systems for technical and management information processing. GDS also serves Grumman Corporation users and provides third-party maintenance. Customers include Defense, NASA, federal and state agencies, and private industry. GDS is a leading federal government vendor in systems integration, professional services, and processing services.

GDS holds a number of multimillion dollar contracts with NASA, Air Force, DLA, Army, and Navy. Specialty areas include command/control/ communications/intelligence systems integration, supercomputer programming and operation, software development, vector and image processing, simulation, mathematical modeling, LANs, very high data rate communications, and intelligent workstations. Grumman's Data Systems Institute (GDSI) provides professional training for post installation of large systems, such as the NASA-MSFC Engineering and Data Systems at Huntsville (AL).

9. Integrated Microcomputer Systems, Inc. (IMS), 2 Research Place, Rockville, MD 20850, (301) 948-4790

IMS, started in 1979, is a software development and systems integration company providing services to commercial and government clients. IMS activities includes communications, LANs, CBMS, office automation, computer security, imaging, and publishing systems. About 95% of its revenue comes from federal government contracts, and the remainder from commercial clients.   In addition to its headquarters, IMS maintains five branch offices and a Taiwanese subsidiary. Eighty-five percent of IMS's revenue is derived from professional services and 15% from systems integration. Federal clients include six cabinet-level departments plus all four military defense agencies.

10. Martin Marietta Information Systems Group (MM/MMISG), 4795 Meadow Wood Lane, Chantilly, VA 22021, (703) 802-5000

MMISG provides a range of products and services to government and industry in areas that include command and control, information management, systems integration, advanced simulation, data processing, artificial intelligence, systems operations, professional services, air traffic control, and communications networks.

In 1989, MMISG restructured operations into seven highly focused business areas, five of which perform projects for DoD, NASA, Agriculture, FAA, Social Security, Energy and GSA. Air Traffic Systems is responsible for the design, integration, and implementation of civilian and military ATC systems, including the FAA National Airspace Plan. Civil Information Systems designs, develops, and integrates multifunctional administrative and operational large-scale systems for clients like the Navy and Agriculture Departments, and offers EDI and transaction processing via three data centers.

11. Planning Research Corporation (PRC), 1500 Planning Research Drive, McLean, VA 22102, (703) 556-1000

The current (1990) PRC is a merger of Advanced Technology, Inc. (Reston, VA) founded in 1976 and PRC, started in 1954. PRC, which became a public corporation in 1964, was acquired by Emhart Corporation in 1986. ATI was acquired by Emhart in 1988. Emhart was in turn acquired by Black and Decker in 1989. ATI and PRC constituted Emhart's Information and Electronic Systems sector, and remained the same under Black & Decker until 1990. This description combines the federal government sector activities, now under the PRC name and a new chief operating officer.

PRC provides professional services, systems integration, systems operations, processing services, and turnkey systems. Both components of PRC also provide a number of non-information services activities in engineering support, technical assistance, acquisition management, and logistics. ATI's principal federal customer has been the Navy. PRC government business clients include NASA, Patent and Trademark Office, EPA, State Department, and HHS. In 1988, before Emhart, the combined revenues were estimated to be over $800 million. PRC currently has large contracts with PTO and NASA.

12. Sterling Software, Inc., 8080 North Central Expressway, Dallas, TX 75206, (214) 891-8600

Sterling Software, begun in 1981, provides professional services, systems and applications software, systems operations, processing/network services, and turnkey systems to commercial and government clients. Since 1983, Sterling has acquired nine companies, the largest of which was Information General Corporation in 1985. Parts of those acquisitions outside Sterling's long-term interests were sold. The corporation is organized into three business groups and various operating divisions. Sterling's Federal Systems Business provides professional services and systems operations for military and non-military projects for the federal government. The Federal Systems Group in Palo Alto (CA) has two divisions: Systems and Scientific Division, working primarily for NASA Ames Research Center, and the Intelligence and Military Division, supporting highly specialized military communications projects. Zero One Systems, Inc., in Santa Clara (CA) specializes in the design and operation of supercomputer data centers. About 35% of Sterlings' revenue has come from federal contracts.

13. SofTech, Inc., 460 Totten Pond Road, Waltham, MA 02154, (617) 890-6900

SofTech started in 1969 and provides custom software development, systems engineering, and systems integration services to government agencies and Fortune 500 companies. The major portion of its business is with the Defense Department. SofTech acquired COMPASS (MA) from Computer Associates in 1988 to provide computer software and professional services in the supercomputer and advanced architecture computer marketplace.

Since 1975, SofTech has been working with Ada, the standard DoD programming language which includes Compiler Validation, Programming Support Environments and the Army's RAPID development system. SofTech is also teamed with BCS on the Army's STARS Program and with General Dynamics on Air Force IMIS. It also has a number of prime contracts with DOE, Air Force, Navy and DLA.
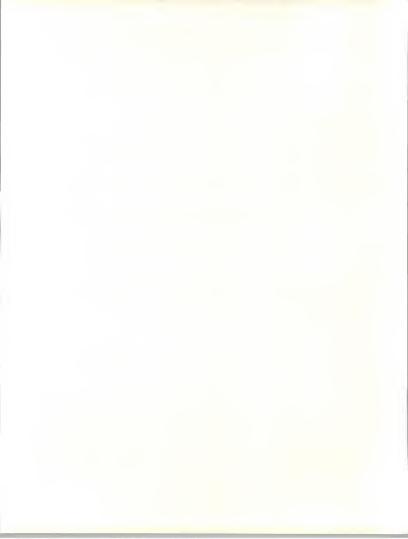
14. SYSCON Corporation, 1000 Thomas Jefferson Street, N.W., Washington, D.C. 20007, (202) 342-4000

SYSCON, started in 1966, provides systems development, systems integration, and systems operations for government agencies and commercial clients. SYSCON was acquired by Harnischfeger Industries in 1986, and now operates as a wholly owned subsidiary. Ninety percent of SYSCON's revenues come from information services; the remainder is derived from engineering and consulting services for electronic and avionic equipment.

Systems development activities are focused on DoD programs for weapons, and command and control systems. Systems integration supports integration of commercial hardware and software to meet system requirements for Army, Education, Air Force, and Navy. Software products include VERSATERM™, ROUTE MANAGER™, CAMMS™, SKETCHER™, 217 PREDICT™, 726 PREDICT™, and NTDS/Plus™.

15. Telos Corporation, 3420 Ocean Park Boulevard, Santa Monica, CA 90405, (213) 450-2424

Telos began in 1969 as Telos Computing and acquired Telecommunications Science Associates and DMA, Inc. Telos provides professional services and hardware maintenance and operates a computer depot repair facility. Professional services account for 80% of Telos' revenues, from software services for automated battlefield systems, control/track/monitor space vehicles for NASA, and a variety of systems development for the FAA, U.S. Postal Service, Treasury, Transportation, Social Security, and National Institutes of Health. Telos operates locations in 37 states and in Washington, D.C.

VI

Conclusions and
Recommendations

VI

Conclusions and Recommendations

This chapter completes the preceding chapters' analyses with conclusions about the federal government market, provides a recap of the issues, and makes recommendations for strategies for user agencies and federal vendors.

A

Industry and Agency Market Conclusions

Industry and agencies recognize that a number of factors are slowing the explosive growth in information technology that characterized the 1980s. There appear to be five key factors charaterizing the market in the first half of the 1990s, as noted in Exhibit VI-1.

EXHIBIT VI-1

Federal Government Sector Market Conclusions

- Lower growth rates overall
- Data-to-information transition
- Fewer large projects
- Standards implications
- New technology prospects

1. Lower Growth Rates

IT will be affected by lower growth rates overall, but it will still be given a fairly strong part of the federal budget to help agencies meet the growing demands for more flexible and responsive government services. The large cuts in the defense budget are expected to impact weapons, platforms and facilities, and ultimately, military personnel staff strengths, as well as IT through CIM consolidation.

2. Data-to-Information Transition

The government is literally drowning in data. NASA admits that it will acquire more data in the next five years than it has collected in more than 20 years of space and orbital exploration. The emphasis is shifting to developing information directly usable by managers and the public. The Paperwork Reduction Act was aimed at eliminating duplicate requests for information and was amended to include more efficient processes for providing information. Agencies are seeking solutions such as executive information systems and decision support systems.

3. Fewer Large Projects

Fewer large projects can be anticipated in the first half of the 1990s. The Presidential Priority Program list has become smaller, and agencies with large unsatisfied needs are moving to modular implementation to avoid the onus of the "Grand Design" objections of GSA. The gearing-down process of defense firms reacting to military spending cuts is presenting a field of competent bidders prepared to lower the price, even if it is fixed price, to win the business. Smaller vendors seem to have slim pickings, unless they consummate alliances with larger vendors.
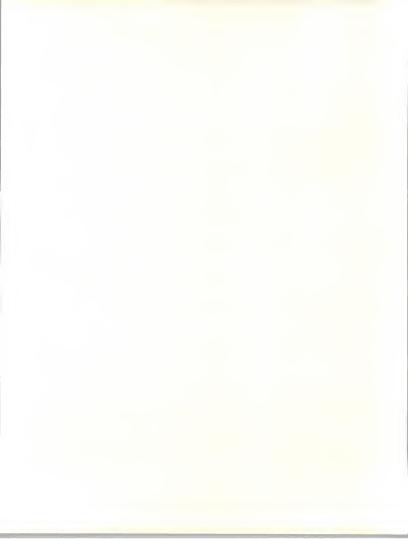
4. Standards Implications

After more than a decade of indecision by civil agencies about the need for a range of standards, all of the government is moving rapidly to enforce standards that offer interplatform connectivity and applications that are platform independent and substantially improved for data interchange. Some vendors not prepared to provide supplies that meet FIPS-PUBS and NIST security standards will lose market share. Platform acceptance may be tied to qualified software, such as the GSA/JFMIP financial packaged software schedules.

5. New Technology Prospects

The federal government has not entirely abandoned support of new information technology offerings. Instead of underwriting development, agencies are now expecting industry to offer demonstrated improvements that will provide enhancements for quality, flexibility, and productivity of processing capabilities that support agency missions. Improvements in artificial intelligence, data base systems, imaging systems and software tools need to be offered as technology improvements to existing facilities.

The federal information technology market of the 1990s will present numerous and varied opportunities in a wide range for vendors. The complexity and politicization of the process will continue to hinder the effective and efficient acquisition of goods and services by the agencies. But despite these obstacles, the sheer size of the federal market offers the potential of contract revenue to vendors that play the game wisely.

B
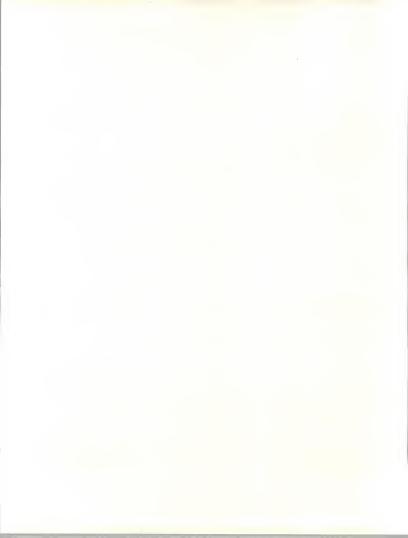## User Agency Issues and Recommendations

1. User Agency Issues

The federal agencies face several major issues as they move forward to modernize and expand their information systems. These issues are shown in Exhibit VI-2.

EXHIBIT VI-2

Federal Government Sector
User Agency Issues

- Cost containment
- Acquisition reforms
- Budget deficit control
- Complex regulations
- Internal agreement on requirements
- Skilled staff availability

- Cost Containment—Cost containment will be a key issue to government agencies responding to the combined pressures of Congress and the continuing slowdown in R&D expenditures. Defense, in particular, is experiencing significant budget cuts. To keep costs within the government's control, competitors are now required or encouraged to submit fixed-price bids on most systems integration and IS upgrade projects.

- Acquisition Reforms—Several new acquisition, management, and use procedures have been incorporated into the Federal Information Resource Management Regulations (FIRMRs), and others are still pending. The reforms are intended to streamline the purchasing process while improving the amount of competition. A number of improvement initiatives under way already include:

  - GO FOR 12, a joint agency program to reduce the acquisition process to 12 months

  - TRAIL BOSS, a GSA program for increasing the acquisition authority of selected government program managers

- FAR (Federal Acquisition Regulations) Streamline, a new initiative to further reduce the volume of regulations and employ conventional business terminology

With two recent changes in management at GSA, there will likely be further changes in IRM policies and procedures.

• Budget Deficit Control—Budget deficit control, whether provided under the terms of the Gramm-Rudman-Hollings Act or by direct congressional action, is expected to affect the rate and/or extent of IS modernization in the agencies. Continuing economic and political sensitivity to the large national budget deficit could negatively impact a number of acquisitions in the less-than-critical defense and civil technology sectors.

Even some programs widely considered critical are taking minor cuts. Major ADP systems already approved are likely to get preference over new and unapproved programs.

• Complex Regulations—The complex and lengthy regulations imposed on the agencies are viewed by many as a severe impediment to systems acquisitions and software development. Each year, Congress imposes new laws and changes existing laws to ensure competition, fair treatment of minorities and the handicapped, and vendor communications restrictions. GSA changes schedule thresholds and ground rules for granting Delegations of Procurement Authority.

• Internal Agreement on Requirements—Combined with regulation complexity is a lack of internal concurrence and management interest in extending information automation. These two issues are of concern to the agencies as they plan systems acquisitions and utilization of new information technology.

• Skilled Staff Availability—The federal government does not currently have the requisite level of in-house staff to support the quality or quantity of supported services mandated by Congress and expected by the American public. The agencies' personnel policies contain outdated standards and job descriptions and impose severe administrative problems. Some resolutions to these problems are being developed. Agencies are working with the Office of Personnel Management to upgrade procurement professionals' skills and give greater support to contracting personnel.

2. User Agency Recommendations

Federal agency users have a limited range of alternatives to contractually acquire goods and services. Prospects for acquiring solutions do exist, as shown in Exhibit VI-3, and discussed below.
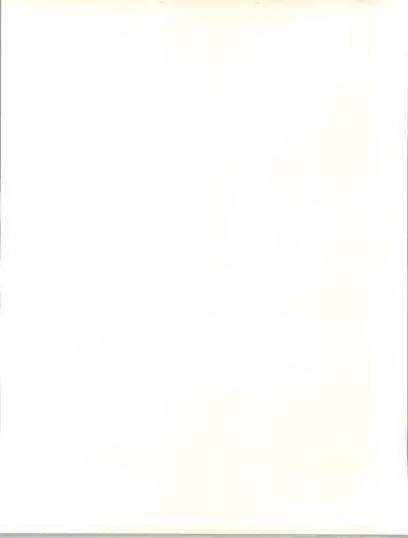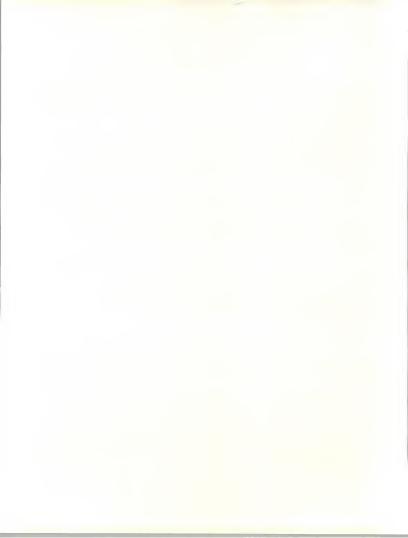
EXHIBIT VI-3

Federal Government Sector
User Agency Recommendations

- Early public notice
- Solution constraints identified
- Vendor qualifications specified
- Carefully crafted solicitations
- Vendor preselection avoided

- Early Public Notice—Not all agencies provide early public notice of requirements that can be solved contractually. Users need to more clearly state intentions and tentative schedule and description of IS need—through the OMB/GSA Five-Year Plan, Agency Long Range Plans, and the *Commerce Business Daily*—as early as possible for maximum industry consideration.

- Solution Constraints Identified—The IS requirements of most agencies are usually embedded in operations mandated by Congress and controlled by a number of interests within and outside of the agency. Users should indicate, to the extent allowed by protocol, the primary constraints associated with the desired solution.

- Vendor Qualifications Specified—Although CICA and other competition supporting legislation emphasize the need for minimum vendor restrictions, agency users should specify the minimum qualifications clearly and early to avoid protests from unsuccessful and unqualified bidders.

- Carefully Crafted Solicitations—Vendors complain that selection criteria for award of an IS contract are either vague or misleading. Users should avoid use of the double standard found in many government procurements where the relative importance of each segment of the proposal as noted in the solicitation is not used by the Source Evaluation Team, which often has a separate, but hidden, weighting to score the proposals.

Many protests about contract awards presented to the General Services Board of Contract Appeals are based on flaws in the Request for Proposal (RFP). In view of the usual delays encountered in getting an RFP out for bid, users should review the document carefully to eliminate ambiguities, to clearly delineate the desired end product or solution, and to define the specific basis(es) for contract award.

• Vendor Preselection Avoided—Congress has noted the increasing number of protests based on apparent selection of desired software or hardware in advance of RFP release. This is often accomplished through the specification of product-specific compatibilities. The reduction in the number of viable IS/IT opportunities, reflecting lower available funding, could result in greater delays if the user agencies do not make their procurements more competitive. The emphasis on connectivity and portability should presumably eliminate restrictions for compatibility.
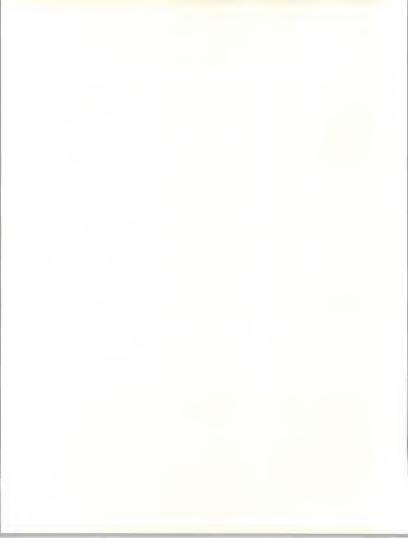
C
IT Vendor Issues and Recommendations

1. IT Vendor Issues

Most executives of the federal vendor community are increasingly pessimistic about the information systems market. Recent federal events and trends need careful consideration in developing marketing strategies for the 1990s. Certain issues represent potentially severe constraints on the availability of competitive opportunities during this decade, as noted in Exhibit VI-4 and discussed below.

EXHIBIT VI-4

Federal Government Sector
Vendor Issues

- Continued defense outlays
- Contract consolidations
- Procurement Integrity Act
- Ethics in Government Act
- OMB Policy A-76
- Fixed-price contracts

• Continued Defense Outlays—In spite of the cuts in defense spending, vendors foresee continued defense outlays for renewals/upgrades of older systems, to the extent that they survive under the CIM Initiative. Larger systems and IT/IS acquisitions will be subjected to much closer scrutiny by both oversight agencies and Congress, and a number are likely to be delayed or cancelled.

- Contract Consolidations—Vendors are concerned by the trend of federal agencies to consolidate contracts that may eliminate prospects for new projects and recompetition of existing programs. However, these larger contracts also provide additional subcontracting and teaming opportunities. In addition, there has been a recent shift toward re-examining Grand Design procurements and acquiring smaller modules in order to reduce government risk.

- Procurement Integrity Act—Vendors now face increased scrutiny of their business and ethical conduct during procurements under the Procurement Integrity Act. This legislation focuses on keeping procurement pure from unauthorized influences. The agencies reacted to the legislation by becoming more restrictive in disclosing information on pending and future procurements, thus making marketing to the government more difficult. Vendors need to develop other legitimate sources of information on procurements.

- Ethics in Government Act—The Act, which was actually a congressional pay raise, suspended the Integrity Act for one year. However, this suspension related primarily to the post-employment restrictions of the Act, rather than contractor relations; modifications were proposed to simplify application to firms. INPUT expects contractor relations to become even more difficult in the 1990s under increasing congressional micromanagement.

- OMB Policy A-76—Federal services vendors are particularly concerned about both the current status and potential codification of the Office of Management and Budget (OMB) Policy A-76 on contracting to the private sector for goods and services. As a policy (not law), the latest version requires industry to price the services at 20% or more below in-house costs, and permits other government data centers to bid against industry. If Congress converts the policy into law, industry believes that exceptions will favor the federal worker and in-house performance.

- Fixed-Price Contract—As a means of limiting risks to the government, contract offices are requiring fixed-price bids on an ever-widening range of services and equipment. Vendors see rising risks for them in inadequately defined requirements, and the agencies' inability to adjust the end product to meet changed needs. The fixed-price contract requires vendors to exercise tight cost controls, to document all user discussions about changes, and to clarify in the beginning the exact process for acceptance of the deliverable(s).
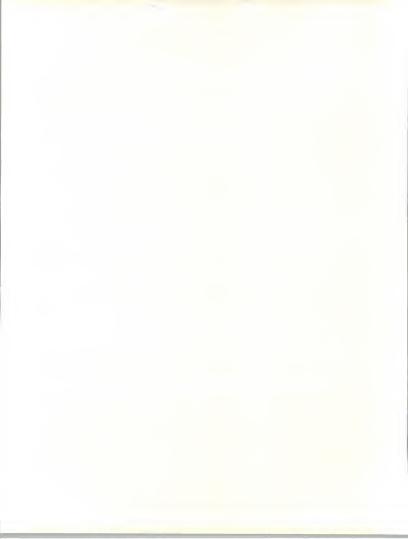
2. Recommended Vendor Strategies

Exhibit VI-5 shows several recommended strategies for vendors in the federal market.

- Maximize Pricing Strategies—Vendors to the federal government must accept the fact that, while the user program manager may prefer incentive contracts, most contracting officers intend to do business on a fixed-price basis. Vendors must find, and put into practice, methods of pricing and managing professional services contracts that allow them to minimize the risk of performance on a fixed-price basis, or they will not be able to compete successfully in the government marketplace. To minimize costs and remain competitive, vendors must make maximum use of automated tools to increase their productivity. In some cases, even this may not be enough, as more contracts are being won through buy-ins.

EXHIBIT VI-5

Federal Government Sector
Recommended Vendor Strategies

- Maximize pricing strategies
- Comply with new federal standards
- Vertically penetrate agency customers
- Maintain positive reputation
- Direct marketing efforts to reflect political emphasis on programs
- Capitalize on specialized expertise
- Target markets

- Comply with New Federal Standards—Any product or service that stresses standards or interoperability will be attractive to the government. Vendors should exhibit to the federal agencies their ability to comply with specified standards and their awareness of the latest technology.

- Vertically Penetrate Agency Customers—Vendors should vertically penetrate potential agency customers to better understand the agency mission and functions and to solve the agency problems, not modify the problem to meet an available solution. Much can be accomplished by stressing the benefits to the customer, rather than the benefits of the service. This is particularly relevant in the area of systems integration.
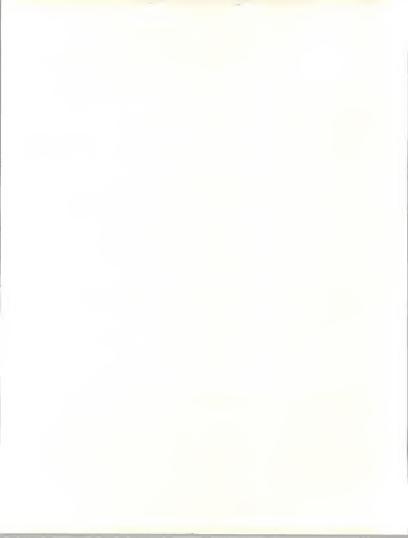
- Maintain Positive Reputation—Vendors should also be aware that, especially in the civil agencies, their reputation is an important factor in whether they can win work with an agency. The government is a small community, and a questionable reputation in one agency can impede getting work in another. Overcoming a poor reference can take a long time. It is extremely important that vendors regularly and systematically survey their agency customers to determine problems, satisfaction levels, trends, and opportunities.

- Direct Marketing Efforts—Vendors can make more effective use of their marketing budgets if they emphasize marketing in areas that are politically popular. In election years, Congress reacts to programs that gain or hold votes. In presidential election years, budgets are more likely to emphasize domestic issues (and therefore support agencies providing domestic services) than technology or defense issues.

- Capitalize on Specialized Expertise—Vendors need to show that they have the specialized expertise and personnel to supplement the agency's in-house staff. INPUT surveys of government agencies reveal projected utilization of contracting for systems operations and software development. This type of work requires specialized expertise that not all vendors possess; however, vendors that do should take advantage of this potential growth area. These areas may not always be as attractive as developing state-of-the-art systems, but they are less risky and often more financially rewarding.

- Target Markets—The slowing of market growth and termination of other electronic systems opportunities have substantially increased the number of competitors. Vendors must focus on markets in which they have prior experience or that require their unique skills.

3. Industry Teaming Activities

In response to increased competition and larger procurements in the federal market, vendors have increased their teaming activities. The type of vendors that companies ally with vary due to the nature and complexity of the RFP.

Hardware and professional services firms are often cited as potential teaming partners. The mix of equipment and staffing skills available from these two types of companies can satisfy many of the equipment and service requirements of federal agencies. Furthermore, many hardware and professional services firms are already recognized leaders in the federal market.
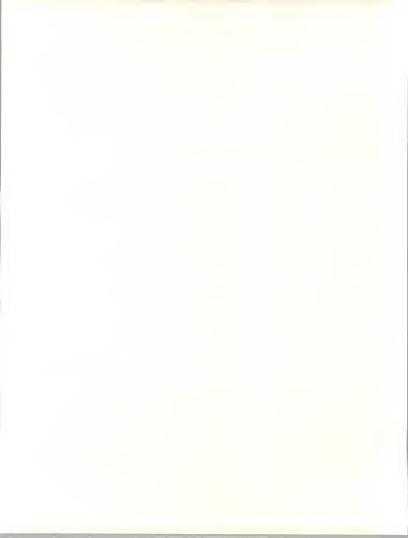
Vendors frequently team with category 8(a) firms or small businesses. This stems from the trend at federal agencies to set aside selected contracts for minority and small businesses and requiring that a percentage of larger contracts be shared with small businesses. Teaming with small businesses will increase as additional contractors comply with legislation promoting small companies.

Suggestions on how to improve teaming relationships with other vendors are summarized in Exhibit VI-6.
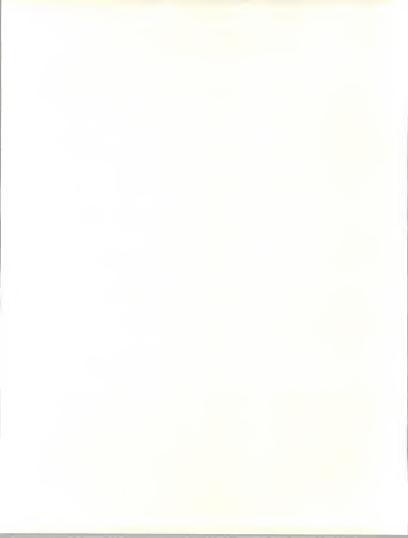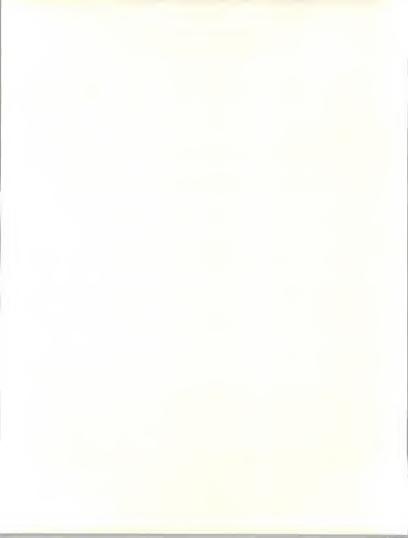
EXHIBIT VI-6
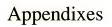

Suggestions for Improved Industry Teaming Relationships

- Pricing flexibility
- Tighter vendor control of project
- Better defining of requirements
- Use key staff
- Improve use of company resources

- Pricing Flexibility—The most important improvement is more cooperation and flexibility in establishing prices among teaming partners to increase the team's chances of submitting a more cost-competitive bid.

- Tighter Control of Project—Vendors with successful alliances and profitable contracts cite the need for tighter control of projects. This underlines user dissatisfaction with previous project management and supervision of some companies' efforts.

- Better Defining of Requirements—Prime vendors should be careful in defining the requirements of a program as they apply to team members. Better identification of requirements aids in developing stronger and more-suitable teaming of companies and their resources for improved responsiveness to agencies' needs.

- Use Key Staff—One response to user criticisms is improvement in the use of key staff. These people are often highly touted in establishing credentials, but fail to be included in the contract for a variety of reasons. Use of key staff in alliances can also assure the user about the prospective quality of the work.

- Improve Use of Company Resources—Allocation of additional staff expertise and management is needed to improve operations benefiting companies' reputations in the long term and to earn them more credibility with agencies. The allocation of additional resources gives the agency user a sign of the vendor's commitment to the success of the contract.
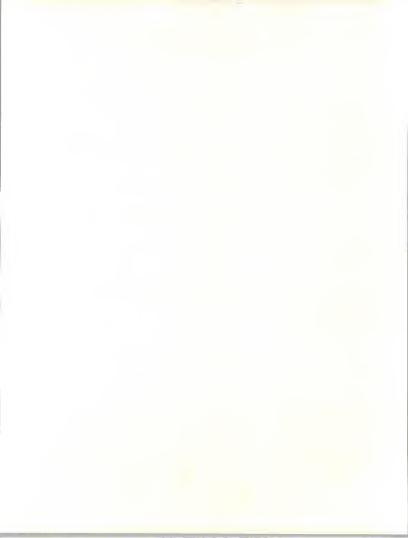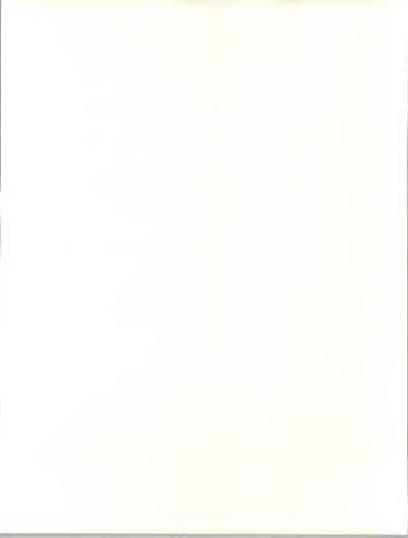
Appendixes

A

Definitions

No industry-specific terms have been used in this report.

See the separate volume, INPUT's *Definition of Terms*, for general definitions of industry structure and delivery modes used throughout INPUT reports.

B

Forecast Data Base

This appendix contains the following forecast information:

- User expenditure forecast data base
- Sector forecast reconciliation, 1990 and 1991 forecasts

Market Structure and Forecast Data Base

The federal government is a standard market sector in the 1991 Market Analysis Program.

INPUT introduced systems operations as a new delivery mode in the 1990 Market Analysis Program. It was created by taking the systems operations submode out of both processing services and professional services. No other change has been made to the delivery mode definitions, and the total forecast expenditures for these three delivery modes are identical to the total forecast expenditures of the two original delivery modes before the breakout of systems operations.

Exhibit B-1 presents the consolidated forecast for the sector.

EXHIBIT B-1

Federal Government Sector
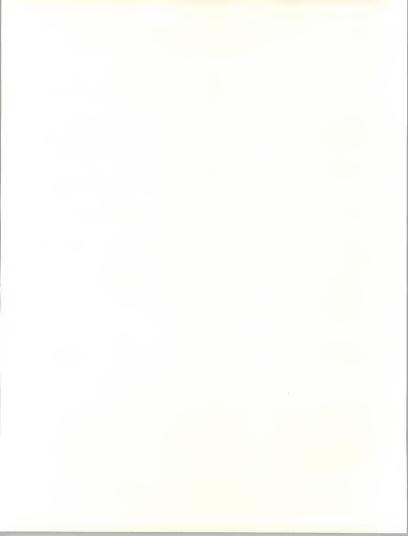### User Expenditure Forecast by Delivery Mode, 1990-1996
($ Millions)

Delivery Modes	1990 ($)	Growth 90-91 (%)	1991 ($)	1992 ($)	1993 ($)	1994 ($)	1995 ($)	1996 ($)	CAGR 91-96 (%)
Sector Total	9,003	6	9,461	10,633	11,828	13,242	14,564	16,489	12
Processing Services	200	-6	187	193	200	206	213	220	3
- Transaction Processing	200	-6	187	193	200	206	213	220	3
Turnkey Systems	494	24	612	736	790	846	896	938	9
Applications Software	390	33	520	580	683	794	886	1,316	20
- Mainframe	90	22	110	114	126	137	144	151	7
- Minicomputer	120	25	150	158	177	208	240	270	12
- Workstation/PC	180	44	260	308	380	449	502	895	28
Systems Operations	1,546	9	1,686	1,837	2,002	2,182	2,379	2,593	9
Systems Integration	3,103	7	3,322	3,916	4,522	5,308	5,987	6,897	16
Professional Services	2,136	-9	1,900	2,038	2,187	2,345	2,517	2,700	7
Network Services	1,134	9	1,234	1,333	1,444	1,561	1,686	1,825	8
- Electronic Info. Svcs.	315	6	334	353	374	396	416	440	6
- Network Applications	819	10	900	980	1,070	1,165	1,270	1,385	9

B

Forecast Reconciliation

The effects of the federal government information technology budget cuts resulting from the suspension of research and development spending in 1989, and the downstream impact of defense and civil agency reductions in the government's fiscal year 1991 Appropriations Act, are evident in this forecast reconciliation.

Processing services declined substantially, from $200 million in 1990 to $187 million in 1991, and will grow only slightly by 1995. The principal cause is the cancellation of GSA's Teleprocessing Services Program in 1991, and the subsequent conclusion of agreements with only two- to three-year life times. Additionally, government data centers are competing for this work under the revised OMB Circular A-76 terms.

The turnkey systems market has begun to improve—in response to delays of larger systems, in a variety of applications that have strong similarity to commercial applications, and in graphics, maintenance scheduling and document indexing systems. Although 1991 and 1992 show strong growth, overall this delivery mode is expected to stay at a CAGR of 9%, up from 5% in 1990.

Applications software is being driven by the very substantial expansion and upgrade of the government's inventory of workstations and PCs, and increasing use of minicomputers. Although short-term growth declined because of delays of the latest PC acquisitions (-29% from forecast), growth through 1996 will increase to 20%, resulting in only a 6% decline from the earlier forecast.

The sustained growth of the professional services component of systems operations forecasted in 1990 was affected by Defense Department spending cuts. By 1995, the annual reduction will amount to $112 million, unless further delays in acquisition of new information processing resources are caused by additional agency cuts under the Gramm-Rudman-Hollings Act.

While network services is performing at the forecasted growth rate in the 1990-1991 time frame, delays in converting FTS 2000 to all-digital service by 1995 is expected to decrease the expected 10% CAGR seen in 1990 to 8% by 1996. If the changeover should occur sooner, two prospects are possible: (1) FTS 2000 with its new digital capability could absorb more of the data networks, or (2) the traffic demand of digital voice, secure digital voice, and video may force more data networks to other carriers outside FTS 2000.

Systems integration prospects remain strong, but the timetable keeps changing in response to a wide range of pressures: the budget deficit, the Defense Department's CIM initiative, economic dislocation, and reduction of the defense infrastructure. 1990 saw part of the increase in civil agency spending—a 24% improvement. By 1995, fueled by the new spending under CIM in 1992, the growth will improve from the 13% CAGR forecast of 1990 to 16%. In 1995, the expected expenditures should be 31% better than forecast a year ago.

The CAGR for systems operations remains nearly the same in 1991, but delays in replacing some systems have improved expenditure by 22% in 1990, and could still be 14% in 1995. The real growth is in the GOCO (government-owned/contractor-operated) segment, literally the opposite of the commercial sector, which is experiencing growth in the processing services segment.
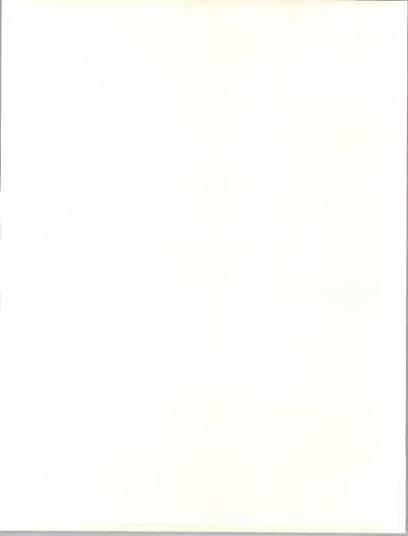
EXHIBIT B-2

Federal Government Sector
1991 MAP Data Base Reconciliation
($ Millions)

Delivery Modes	1990 Market				1995 Market				90-95 CAGR per data 90 rpt (%)	90-95 CAGR per data 91 rpt (%)
	1990 Report (Fcst) ($)	1991 Report (Actual) ($)	Variance from 1990 Report ($)	Variance from 1990 Report (%)	1990 Report (Fcst) ($)	1991 Report (Fcst) ($)	Variance from 1990 Report ($)	Variance from 1990 Report (%)		
Total Federal Government Sector	8,205	9,003	798	10	12,885	14,564	1,679	13	9	12
Processing Services	200	187	-13	-6	240	213	-27	-11	4	3
Turnkey Systems	427	494	67	16	545	896	351	64	5	9
Applications Software	546	390	-156	-29	945	886	-59	-6	12	20
Systems Operations	1,271	1,546	275	22	2,090	2,379	289	14	10	9
Systems Integration	2,493	3,103	610	24	4,573	5,987	1,414	31	13	16
Professional Services	2,136	2,136	0	0	2,629	2,517	-112	-4	4	7
Network Services	1,133	1,134	1	0	1,863	1,686	-177	-10	10	8

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