FEDERAL PROFESSIONAL SERVICES MARKET

1990 - 1995

INPUT

About INPUT

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

Subscription services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services. INPUT specializes in the software and services industry which includes software products, systems operations, processing services, network services, systems integration, professional services, turnkey systems, and customer services. Particular areas of expertise include CASE analysis, information systems planning, and outsourcing.

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

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

INPUT OFFICES

North America

San Francisco
1280 Villa Street
Mountain View, CA 94041-1194
Tel. (415) 961-3300 Fax (415) 961-3966

New York
Atrium at Glenpointe
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
Tel. (201) 801-0050 Fax (201) 801-0441

Washington, D.C.
INPUT, INC.
1953 Gallows Road, Suite 560
Vienna, VA 22182
Tel. (703) 847-6870 Fax (703) 847-6872

International

London
INPUT LTD.
Piccadilly House
33/37 Regent Street
London SW1Y 4NF, England
Tel. (071) 493-9335 Fax (071) 629-0179

Paris
INPUT SARL
24, avenue du Recteur Poincaré
75016 Paris, France
Tel. (1) 46 47 65 65 Fax (1) 46 47 69 50

Frankfurt
INPUT LTD.
Sudetenstrasse 9
W-6306 Langgöns-Niederkleen, Germany
Tel. 0 6447-7229 Fax 0 6447-7327

Tokyo
INPUT KK
Saida Building, 4-6
Kanda Sakuma-cho, Chiyoda-ku
Tokyo 101, Japan
Tel. (03) 3864-0531 Fax (03) 3864-4114

DECEMBER 1990

FEDERAL PROFESSIONAL SERVICES MARKET

1990-1995

INPUT®

1953 Gallows Road, Suite 560, Vienna, Virginia 22182 (703) 847-6870

Published by
INPUT
1280 Villa Street
Mountain View, CA 94041-1194
U.S.A.

Federal Information Systems and Service Program (FISSP)

Federal Professional Services Market, 1990-1995

Copyright ©1990 by INPUT. All rights reserved.
Printed in the United States of America.
No part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

FIFP7 • 432 • 1990

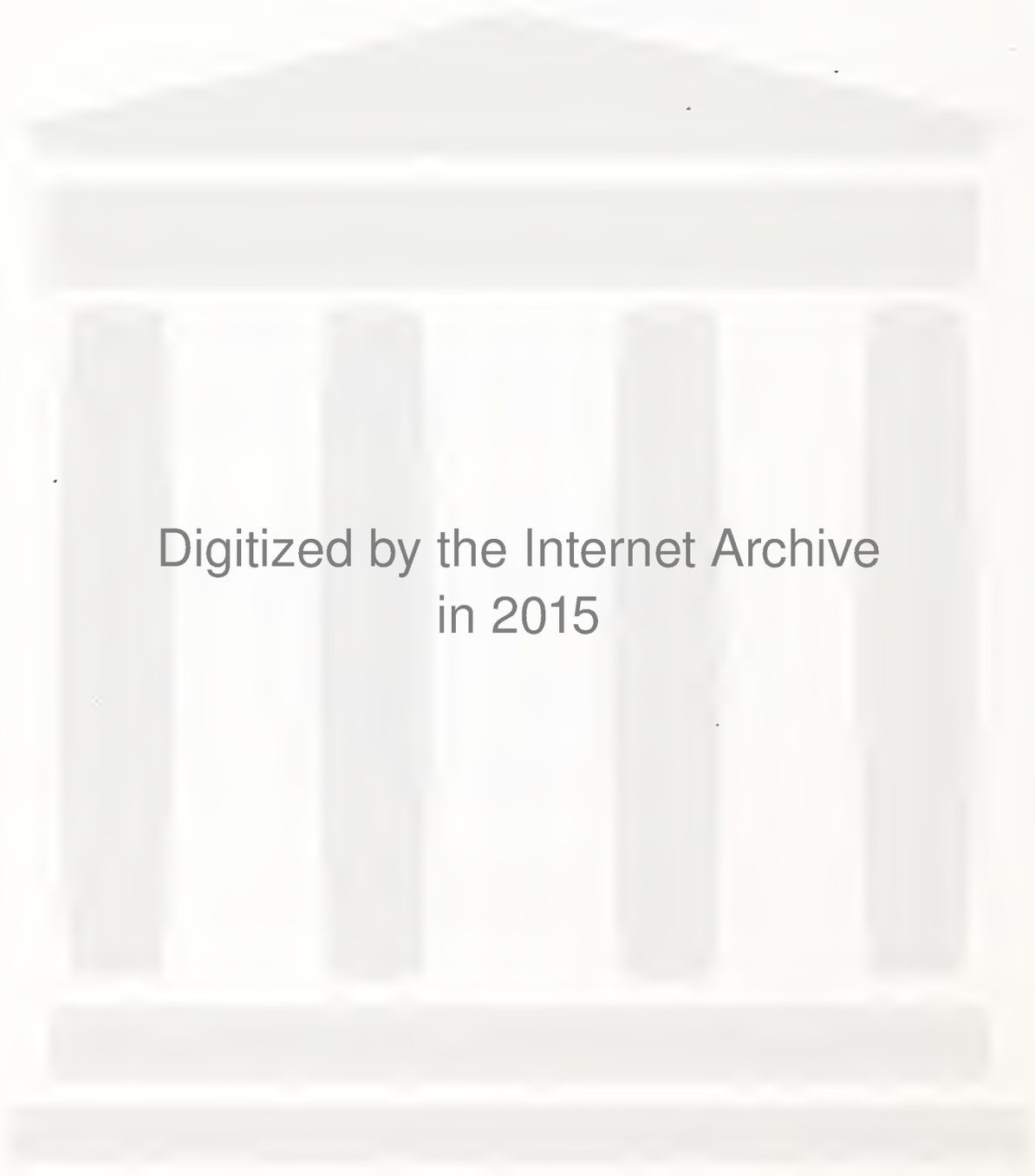
Abstract

According to this report, the federal market demand for professional services will sustain a 7% compound annual growth rate in the FY 1990-1995 forecast period. This market is now expected to increase from $3.4 billion in 1990 to $4.9 billion in 1995.

The federal professional services market will remain highly competitive and face increasing pressure from small-business and minority-owned firms, as well as aerospace firms. In addition, the market continues to be highly price sensitive, with progressively narrower margins and more tightly controlled overhead. This report analyzes agency plans for future use of professional services. It also discusses vendor status, future market plans, and selection criteria; vendor performance characteristics; contracting policy and preferences; and major contract opportunities in this period.

This report contains 210 pages and 61 exhibits, and is an update of a previous report of the same title.

© 1990 by INPUT. Reproduction Prohibited.


Digitized by the Internet Archive
in 2015

https://archive.org/details/federalprofessio07unse

Table of Contents

I	Introduction	I-1
	A. Scope	I-2
	B. Methodology	I-2
	C. Report Organization	I-3
II	Executive Overview	II-1
	A. Federal Market Pressures	II-1
	B. Market Forecast	II-2
	C. Key Application Areas	II-3
	D. Key Vendors	II-4
	E. Agency Satisfaction	II-5
	F. Characteristics of Successful Contractors	II-6
	G. Recommendations	II-7
III	Market Analysis and Forecast	III-1
	A. Overview	III-1
	B. Market Forecast, 1990-1995	III-1
	1. Systems Operations (SO)	III-2
	2. Consulting Services	III-4
	3. Education and Training	III-4
	4. Software Development	III-5
	C. Vendors of Professional Services to the Government	III-6
	1. Rank of Leading Professional Services Vendors	III-6
	2. Vendor Profiles	III-8
	a. Computer Sciences Corporation (CSC)	III-8
	b. Unisys	III-10
	c. Martin Marietta	III-11
	d. Grumman Data Systems	III-12
	e. Computer Data Systems Inc. (CDSI)	III-12
	f. Electronic Data Systems (EDS)	III-13
	g. Centel Federal Systems	III-14
	h. Black & Decker	III-15

© 1990 by INPUT. Reproduction Prohibited.

Table of Contents (Continued)

III

i. IBM III-16
j. Syscon III-16
k. The Mitre Corporation III-17
l. BDM III-18
m. Oracle III-18
n. SAIC III-19
o. Softech III-20
p. Sterling Software III-21
q. OAO Corporation III-22
r. Cincinnati Bell Information Systems (CBIS) III-22
s. Control Data Corporation (CDC) III-23
t. American Management Systems (AMS) III-23

3. Other Professional Services Vendors III-24

D. Market Size by Agency III-25

E. Federal Market Issues III-27

1. The Grand Design Approach III-27
2. The Competition In Contracting Act (CICA) III-28
3. Budget Constraints III-29
4. POSIX III-30
5. GOSIP III-31
6. Computer Security III-31
7. Ada III-32
8. Artificial Intelligence III-33
9. Procurement Integrity Act III-34
10. Trail Boss III-34
11. MASCs III-35
12. Mergers and Acquisitions III-35

IV Federal User Requirements and Trends IV-1

A. Significant Problems/Issues IV-1

1. Budget and Personnel Constraints IV-1
2. IS Equipment Inventory Upgrade IV-2
3. Personal Computers IV-2
4. Embedded Computers IV-3
5. Software and Related Services IV-3

B. Budget and Applications IV-4

1. Professional Services Budget Distribution IV-8
2. Application Areas IV-10

C. Agency Perceptions of Professional Services IV-12

1. Advantages/Benefits of Professional Services IV-12
2. Disadvantages/Liabilities of Professional Services IV-14

D. Case Studies of Professional Services Contracts IV-15

E. Acquisition Plans and Preferences IV-30

1. Characteristics of a Successful Contractor IV-30
2. Selection Criteria IV-31

© 1990 by INPUT. Reproduction Prohibited.

Table of Contents (Continued)

IV

3. Preference for Type of Vendors IV-32
4. Contract Types IV-33

F. Projected Trends in the Use of Professional Services IV-34
1. Increases/Decreases in Contracting IV-34
2. Transition/Conversion to In-House Support IV-34
3. Reasons for Transition/Conversion IV-35
4. Factors Affecting Future Use of Professional Services IV-36
5. Future Suggestions for Improvements to Vendor Services IV-39

V Competitive Trends V-1

A. Vendor Participation V-1
B. Vendor Market Perceptions V-5
1. Advantages/Benefits of Contracting V-5
2. Disadvantages/Liabilities of Contracting V-7
3. Poor/Satisfactorily Performed Contracts V-8
a. Satisfactorily Performed Contracts V-9
b. Poorly Performed Contracts V-10
4. Differences between Commercial and Federal Government Markets V-10
5. Vendor Perceptions of Agency Opportunities V-12
6. Satisfaction Level V-13
C. Vendor Contracting Views V-15
1. Available ContractingVehicles V-15
2. Preferred Contract Types V-15
3. Characteristics of a Successful Contractor V-17
4. Perception of Most Attractive Product or Service V-18
5. Selection Criteria V-19
D. Trends V-20
1. Increases/Decreases in Professional Services V-20
2. Factors Affecting Government Spending V-21
3. Industry Trends Affecting Vendor Revenue V-22
4. Technology Trends V-24
E. Recommendations V-25

VI Professional Services Opportunities VI-1

A. Future Programs VI-1
B. Professional Services Opportunities by Agency VI-3

© 1990 by INPUT. Reproduction Prohibited.

Table of Contents (Continued)

VII Appendixes A-1

A. Professional Services Interview Profiles A-1
A. Federal Agency Respondent Profile A-1
1. Contact Summary A-1
2. List of Agencies Interviewed A-1
B. Vendor Respondent Profile A-3
C. Case Study Respondent Profile A-3
B. Definitions B-1
A. Delivery Modes B-1
B. Hardware/Hardware Systems B-9
C. Telecommunications B-11
D. General Definitions B-13
E. Other Considerations B-22
C. Glossary of Acronyms C-1
A. Federal Acronyms C-1
B. General and Industry Acronyms C-11
D. Policies, Regulations, and Standards D-1
A. OMB Circulars D-1
B. GSA Publications D-1
C. DoD Directives D-1
D. Standards D-2
E. Related INPUT Reports E-1
A. Annual Market Analyses E-1
B. Industry Surveys E-1
C. Market Reports E-1
F. Questionnaires F-1
A. 1990 Case Study Questionnaires F-1
1. Definitions F-1
2. Federal ProfessionalServices Case Study—Agency Questionnaire, 1990-1995 F-3
3. Federal Professional Services Case Study—Contractor Questionnaire, 1990-1995 F-8
B. 1988 Questionnaires F-12
1. Definitions F-12
2. Federal Professional Services Market—Agency Questionnaire, 1988-1993 F-13
3. Federal Professional Services Market—Industry Questionnaire, 1988-1993 F-15

© 1990 by INPUT. Reproduction Prohibited.

Table of Contents (Continued)

VII

C. 1987 Questionnaires F-21
1. Definitions F-21
2. Federal Professional Services Market—Agency Questionnaire, 1987-1992 F-22
3. Federal Professional Services Market—Industry Questionnaire, 1987-1992 F-28

VIII About INPUT VIII-1

© 1990 by INPUT. Reproduction Prohibited.

Exhibits

II

-1 Federal Market Pressures II-1
-2 Professional Services Market II-2
-3 Key Application Areas II-3
-4 Top Five Federal Government Professional Services Vendors, 1989 II-4
-5 Competitive Forces II-5
-6 Agency Satisfaction with Professional Services Vendors II-5
-7 Rankings of Characteristics of Successful Contractors II-6
-8 Recommendations II-7

III

-1 Federal Government Professional Services Market—GFY 1990-1995 III-2
-2 Top Federal Government Professional Services Vendors, 1989 III-7
-3 Federal Government Agency Professional Services Budgets, GFY 1990-1991 III-26
-4 Intent of the Competition in Contracting Act (CICA) III-28
-5 Federal Agencies' Software Requirements III-30
-6 Use of Artificial Intelligence in Federal Agencies III-33

IV

-1 Federal Government Professional Services Top Four Agency Users, GFY 1988—Service Category: Software Development IV-5
-2 Federal Government Professional Services Top Four Agency Users, GFY 1988—Service Category: Consulting Services IV-6
-3 Federal Government Professional Services Top Four Agency Users, GFY 1988—Service Category: Education and Training IV-7
-4 Federal Government Professional Services Top Four Agency Users, GFY 1988—Service Category: Systems Operations IV-8
-5 Professional Services Budget Distribution by Service Category—Civil Agencies IV-9

© 1990 by INPUT. Reproduction Prohibited.

Exhibits (Continued)

IV

-6 Professional Services Budget Distribution by Service Category—Defense Agencies IV-9
-7 Federal Government Professional Services Application Areas—Civil Agencies IV-10
-8 Federal Government Professional Services Application Areas—DoD Agencies IV-11
-9 Agency Views of Advantages/Benefits of Professional Services IV-13
-10 Agency Views of Disadvantages/Liabilities of Professional Services IV-14
-11 Rankings of Characteristics of Successful Contractors IV-30
-12 Relative Ranking of Criteria Used in Selecting a Professional Services Vendor IV-31
-13 Federal Agency Vendor Type Preference for Professional Services IV-32
-14 Federal Agency Contract Type Preference for Professional Services IV-33
-15 Changes in Agency Use of Basic Ordering Agreements (BOAs) IV-34
-16 Agency Plans for Conversion of Current Professional Services and Support IV-35
-17 Agency Views of Factors Impacting Future Use of Professional Services IV-37
-18 Technological Factors Affecting Future Government Spending for Professional Services IV-39
-19 Civil Agencies' Suggestions for Improvements to Vendor Services IV-40
-20 Defense Agencies' Suggestions for Improvements to Vendor Services IV-40

V

-1 Revenue Characteristics of Respondent Professional Services Vendors V-2
-2 Types of Professional Services Provided by Respondents V-3
-3 Professional Services Competition from In-House Government Staff V-4
-4 Source of Follow-on Support for Professional Services Contracts V-4
-5 Vendor Views of Advantages/Benefits of Professional Services V-6
-6 Vendor Views of Disadvantages/Liabilities of Professional Services V-7
-7 Factors Contributing to Satisfactorily Performed Contracts V-8
-8 Factors Contributing to Poorly Performed Contracts V-9

© 1990 by INPUT. Reproduction Prohibited.

Exhibits (Continued)

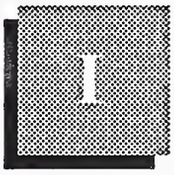
V

-9	Government versus Commercial Market Differences	V-11
-10	Vendor Perception of Agency Opportunities for Professional Services	V-12
-11	Application Types Contracted to Professional Services Vendors	V-13
-12	Vendor Perception of Agency Satisfaction with Professional Services Contractors	V-14
-13	Vendor Perception of Agency Satisfaction with Case Study Examples	V-14
-14	Vendor Preference for Contract Type for Professional Services	V-16
-15	Vendor Perception of SETA Contracting for Professional Services	V-17
-16	Vendor Perception of the Relative Importance of Vendor Characteristics to Federal Agencies	V-18
-17	Vendor Ranking of Attractive Products and Services to Government Agencies	V-19
-18	Vendor Perception of the Importance of Contractor Selection Criteria to Federal Agencies	V-20
-19	Vendor-Expected Change in Contracting for Professional Services	V-20
-20	Ranking of Factors Affecting Future Government Spending for Professional Services	V-21
-21	Ranking of Industry Trends Affecting Revenue in the Federal Market	V-22
-22	Impact of Technology on Professional Services Vendors	V-23
-23	Current and Planned Vendor Qualification in Ada	V-24
-24	Vendor Ranking of Technological Factors Affecting Future Government Spending for Professional Services	V-25
-25	Recommendations	V-26

B

-1	Federal Information Systems and Services Program—Information Services Industry Structure, 1990	B-2
-2	Software Products	B-5

© 1990 by INPUT. Reproduction Prohibited.



Introduction

The Federal Government Professional Services Market, 1990-1995 is a revision of a report issued in July 1989. The report has been revised in response to continuing client interest in this changing market. The 1990 update identifies market issues and trends that impact professional services contractors and vendors entering the market through FY 1995. Insight into agency requirements and perceptions, and contractor guidance, are offered to help vendors plan their strategies to compete for federal professional services contracts.

This report on professional services activities that are provided to the federal government was prepared as part of INPUT's Federal Information Systems and Services Program (FISSP). Reports issued through this program are designed to assist INPUT's U.S. industrial clients in planning how to satisfy future federal government needs for computer-based information systems and services. The report's findings are based on research and analyses of several sources, including:

- INPUT's Procurement Analysis Reports (PARs)
- OMB/GSA Five-Year Information Technology Plans for 1990-1995
- Interviews with leading professional services contractors
- Interviews with federal agency officials who manage existing professional services contracts
- Interviews with prime contractors of existing professional services contracts
- Federal agency GFY 1990 and GFY 1991 Information Technology Budgets

© 1990 by INPUT. Reproduction Prohibited.

A

Scope

The period covered in the report is GFY 1990 through 1995. Vendor interviewees were selected because they were either identified as contractors of record for existing professional services contracts or listed as professional services vendors in INPUT's Vendor Analysis Program data base for 1989. The case studies of professional services projects were identified through previous INPUT Procurement Analysis Reports (PARs) or were suggested in conversations with clients. In order to obtain complete case study examples of awarded professional services projects, agency program managers and representatives of the prime contractor of record for specific projects were both interviewed.

For the purposes of the 1990 study, INPUT defined professional services as encompassing the following categories of vendor products and services (see Appendix B for detailed explanations of each category):

- Software Development
- Consulting Services
- Education and Training
- Systems Operations (GOCO Facilities Management)

This report excludes systems integration, hardware and software maintenance after installation, and user acceptance as product categories for professional services.

B

Methodology

The OMB/GSA Five-Year Plan analysis for the INPUT Procurement Analysis Report was reviewed for programs to be initiated during the GFY 1990-1995 period. INPUT also researched agency long-range plans for GFY 1990-1995 to identify significant spending changes and leading and lagging agencies for professional services opportunities.

The contractor case study questionnaire was designed to acquire summary data on programs that have been awarded to professional services contractors.

The questionnaires developed for agency officials and vendors for the earlier version of this report are also included in Appendix F:

- The agency questionnaires were designed to acquire information about current experience and plans for future use of professional services.
- The vendor questionnaire was designed to acquire information on industry status and future federal market plans.
- For comparison, both included similar questions about contracting policy and preference, selection criteria, and vendor performance characteristics.

Federal agency officials selected for interview in the current and previous editions of this report included:

© 1990 by INPUT. Reproduction Prohibited.

- Contract officers
- Program managers

Industry representatives selected for interview in the current and previous editions of this report included:

- Marketing executives
- Technical executives
- Corporate executives
- Project/program managers of specific professional services contracts

The current versions of the Federal Information Resource Management Regulations, Federal Acquisition Regulations, Defense Acquisition Regulations (changes to FAR), and Multiple Agreement Schedule policy were investigated to identify changes that will impact professional services contracts and/or contract performance.

C Report Organization

This report consists of five additional chapters:

- Chapter II is an Executive Overview describing the major points and findings in this report.

- Chapter III provides the market forecast and describes the major market issues and trends impacting the industry.

- Chapter IV summarizes federal agencies' requirements of professional services contractors and includes case study examples of professional services projects.

- Chapter V presents the vendors' perspectives on the federal professional services market.

- Chapter VI provides a sample of business opportunities presented by programs and initiatives in the federal market that anticipate seeking the services of a professional services contractor.

Several appendixes are also provided:

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

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

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.

II

Executive Overview

A

Federal Market Pressures

The federal market for information technology professional services is expected to continue to grow over the next five years. Some of the pressures driving this growth are listed in Exhibit II-1. Government programs require steady improvement in both the quality and quantity of information technology support.

EXHIBIT II-1

Federal Market Pressures

- Improve productivity
- Technical staff shortage
- Budget deficit
- Contracting-out bias

In its drive to improve productivity, to do more with less, the federal government is growing increasingly reliant on information technology. At the same time, functional and pricing trends, especially in terms of hardware solutions and associated software, have opened new opportunities in government for using technology.

Agencies continue a heavy commitment to maintain and enhance existing systems, as well as developing new systems. However, staff shortages effectively prevent in-house performance of these tasks. However, pressure to reduce the federal budget deficit increases the chances that some programs will be eliminated.

© 1990 by INPUT. Reproduction Prohibited.

During the 1980s, the Reagan administration encouraged contracting out many formerly in-house activities, including professional services. The emphasis on OMB Circular A-76, as well as Executive Order 12615 ("Performance of Commercial Activities"), illustrates the bias toward contracting out. But most agencies have not contracted out professional services to any great degree; most of them seem to have quietly given lip service to Circular A-76.

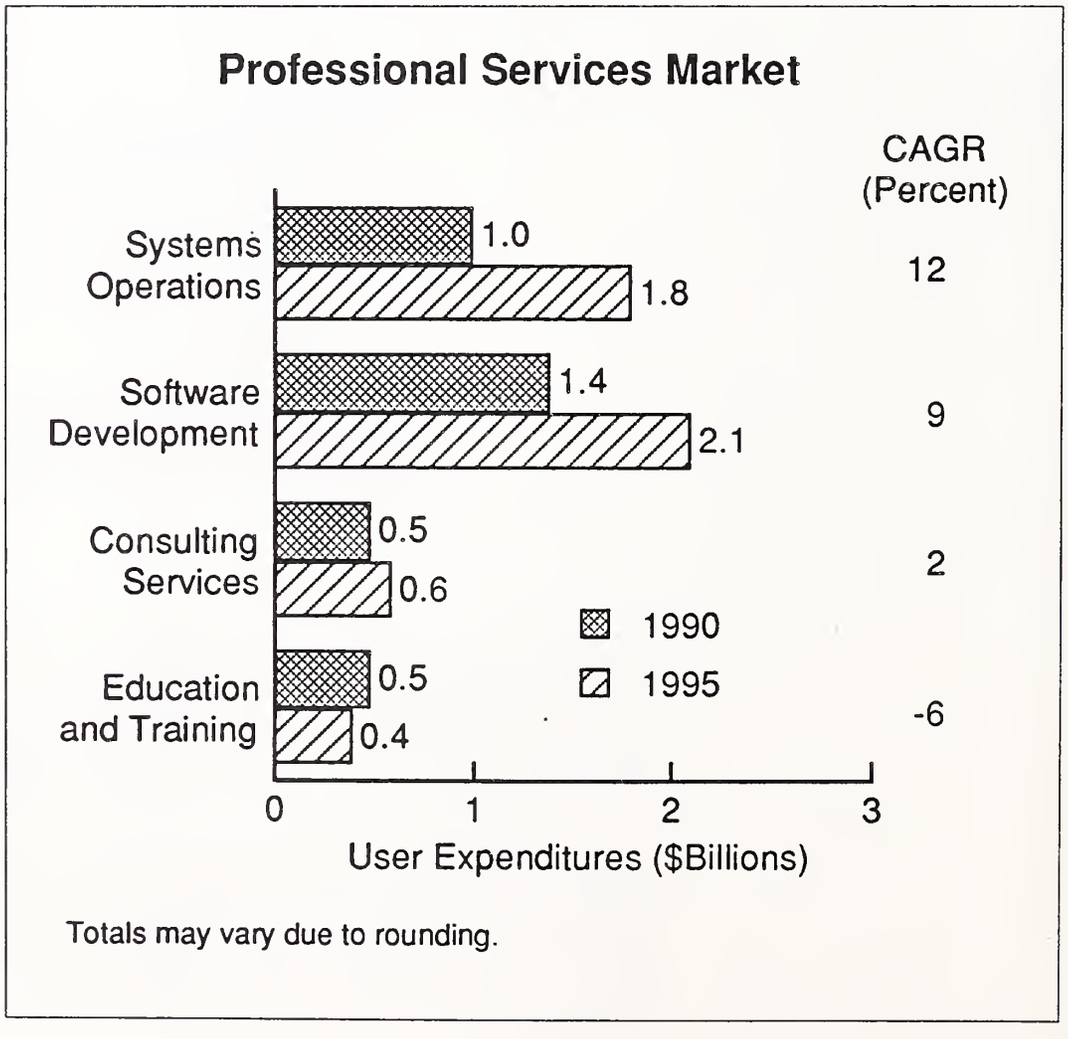
Federal personnel policies support more use of professional services firms. Practically all agency executives that INPUT interviewed cited difficulty in hiring staff with strong technical credentials. Good candidates can usually obtain higher salaries in the private sector.

B

Market Forecast

INPUT estimates that the federal professional services market will increase from $3.4 billion in FY 1990 to $4.9 billion by FY 1995, a compound annual growth rate of 7%. Exhibit II-2 displays a breakdown of the market into four subordinate areas.

EXHIBIT II-2



© 1990 by INPUT. Reproduction Prohibited.

As noted in the exhibit, INPUT expects systems operations to continue to experience growth over the next five years, but at a lower rate. In previous years, INPUT included the professional services portion of systems integration within the professional services forecast. The SI portion of the forecast usually showed the greatest growth rate, which increased the rate of the overall professional services market. Now INPUT has excluded this delivery mode and thus the CAGR will be lower than previous estimates.

Last year's forecast showed a big increase in the systems operations (GOCO) delivery mode. Last year's CAGR was projected at 15%, and this year it fell to 12%. The shortage of in-house technical experts, as discussed above, limits many agencies in managing their centers. More and more agency executives are looking to the marketplace for creativity and innovation in solving government problems.

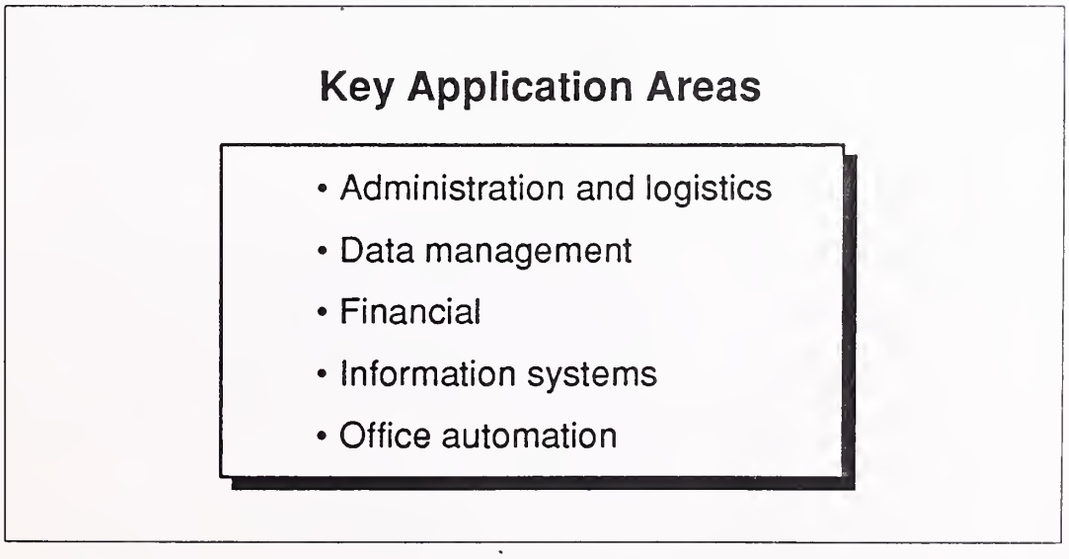
Though software development has traditionally taken the biggest piece of professional services, INPUT now finds this changing. The growing use of software packages, as well as agency policies encouraging their use, is holding down the increase in this category. The other categories are also growing more slowly, due primarily to a folding of these activities into systems integration.

C

Key Application Areas

Professional services have supported and will continue to support a wide variety of application areas. Although DoD and civilian agencies differ somewhat in their emphasis, the application areas of administration and data management dominate their responses, as shown in Exhibit II-3. Logistics support is also becoming more important as agencies move to automate supply and delivery processes.

EXHIBIT II-3



© 1990 by INPUT. Reproduction Prohibited.

Financial activities, along with logistics, compose the largest single set of applications. Other applications cover a range of information systems and appear unique to individual agencies. However, many agencies mention office automation, LANs, distributed processing, and centralized data base applications.

D

Key Vendors

INPUT's listing of the top five professional services vendors is in Exhibit II-4. This listing does not change significantly from year to year. CSC and Unisys have retained their rankings from INPUT's 1989 report. Black & Decker, although a new name, is actually two familiar faces put together. PRC and Advanced Technology, Inc., the two information systems vendors owned by Black & Decker, reported combined revenue to INPUT this year. In 1991, the companies will be fully combined under the name PRC Inc.

EXHIBIT II-4

Top Five Federal Government Professional Services Vendors 1989

Vendor	Rank*
Computer Sciences Corp.	1
Unisys	2
Black & Decker	3
Martin Marietta	4
Grumman Data Systems	5

*Based on information from vendors for calendar year 1989.

The federal professional services market continues to grow more competitive as more firms enter the market and margins grow tighter. Exhibit II-5 lists the competitive forces driving the market. Further, the government sets aside many professional services opportunities for small businesses or 8(a) firms. Larger companies can team on many of these opportunities, but new rules on subcontracting will limit their participation.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT II-5

Competitive Forces

- Set-asides for 8(a) or small businesses
- New players in the market
  - Aerospace firms
  - Big 6 accounting firms
  - Specialized niche firms

Many companies that traditionally did not participate in this market are now beginning to play a major role. Aerospace firms, "Big 6" accounting firms, and some specialized niche vendors are strengthening their Washington area offices to pursue this market. Some specialized niches include software development relying on a particular technical discipline, training on certain product lines, or consulting on federal IRM acquisition practices.

E

Agency Satisfaction

The overall level of satisfaction with contracted professional services remains fairly low. Exhibit II-6 compares agency satisfaction levels with vendors' perception of those satisfaction levels. For the most part, vendor responses corresponded to those of agency counterparts.

EXHIBIT II-6

Agency Satisfaction with Professional Services Vendors

Vendor Quality	Ratings*		
	Civil	(DoD)	Vendor
Delivery schedule	2.8	3.3	2.9
Cost	2.9	3.8	3.2
Project management	2.9	3.4	3.1
Development visibility	3.1	3.6	3.1

*Scale of 1 to 5, with 5 being highest

© 1990 by INPUT. Reproduction Prohibited.

The low satisfaction levels expressed by agencies represent a fundamental vendor problem that vendors believe can be alleviated by holding down costs and adhering to delivery schedules. The agencies are dissatisfied with the vendors because they believe that vendors do not listen to the agencies' needs and do not provide the solutions that agencies want. The data suggests sizable problems for many professional services firms, especially among civilian agencies.

F

Characteristics of Successful Contractors

As another measure of agency satisfaction, Exhibit II-7 compares the views of agencies and vendors on the characteristics of successful contractors. In this case, DoD and Civil agencies differed sharply on the rankings of vendor characteristics. The DoD ranked price and software development experience as most important, while the civil agencies ranked staff experience as number one and price as number two. It is interesting to note that vendors ranked these three characteristics as high as did the agencies.

EXHIBIT II-7

Rankings of Characteristics of Successful Contractors

Characteristic	Ranking*		
	Civil Agencies	DoD Agencies	Vendors
Price	2	1	1
Support	4	4	7
Staff experience	1	5	2
Software development experience	3	1	3
Application/functional experience	4	3	6
Federal contract experience	6	7	4
Agency experience	7	5	4

*Ranking: 1 = Most important, 7 = Least important

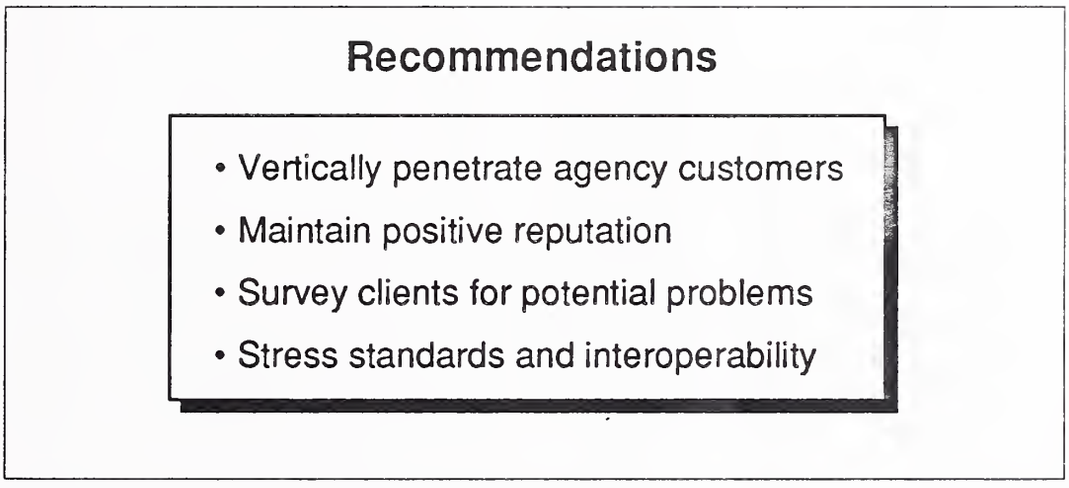
© 1990 by INPUT. Reproduction Prohibited.

G

Recommendations

Vendors need to accept the notion that though program managers may prefer incentive contracts, most contracting officers still prefer to do business on a fixed-price basis. Vendors need to find, and put into practice, methods of pricing and managing professional services contracts that allow them to minimize risk. To constrain costs and remain competitive, vendors should make maximum use of automated tools to increase their productivity. INPUT also recommends the steps listed in Exhibit II-8.

EXHIBIT II-8



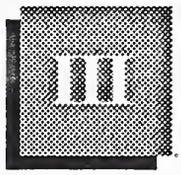
Vertical penetration relates to supporting agencies at a series of points in the systems process, rather than just through a single contract. For example, a successful system design may lead to substantial follow-on work in systems implementation. This kind of account control can frequently be very profitable for professional services vendors.

Maintaining a positive reputation is critical in the federal market, despite stringent procurement rules. Regardless of how evaluation criteria are written, agencies can usually find a way to avoid contract awards to an unwanted bidder. Vendors could further improve their reputations by surveying their clients and resolving issues.

Finally, professional services vendors can improve their competitive positions by stressing standards and interoperability. Standards are a hot issue right now in the federal market, because so many systems need to communicate. Systems developed in accordance with published standards will be more valuable to agency customers.

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Market Analysis and Forecast

A

Overview

Over the past few years, the federal government's use of professional services contracts has grown considerably. This growth has occurred despite continuing budget constraints in many agencies. It arises from various factors, including personnel policies, technically complex functional requirements, and growing support requirements, which are discussed later in this chapter.

The forces driving this growth will, however, decline during the remainder of the Bush Administration. The slow growth of the market reflects the decline in growth in the total federal IS budget and the total federal budget.

The slower federal budget growth has led to intense competition for available contracts. Many companies, formerly on the periphery of this market and historically focused on other areas, are now pursuing this market. These factors, along with continuing client interest, have also led INPUT to update this report every year.

B

Market Forecast, 1990-1995

The federal professional services market will grow from $3.4 billion in GFY 1990 to $4.9 billion in GFY 1995, at a compound annual growth rate of 7%, as illustrated in Exhibit III-1. The previous expected growth rate for this market was 8%.

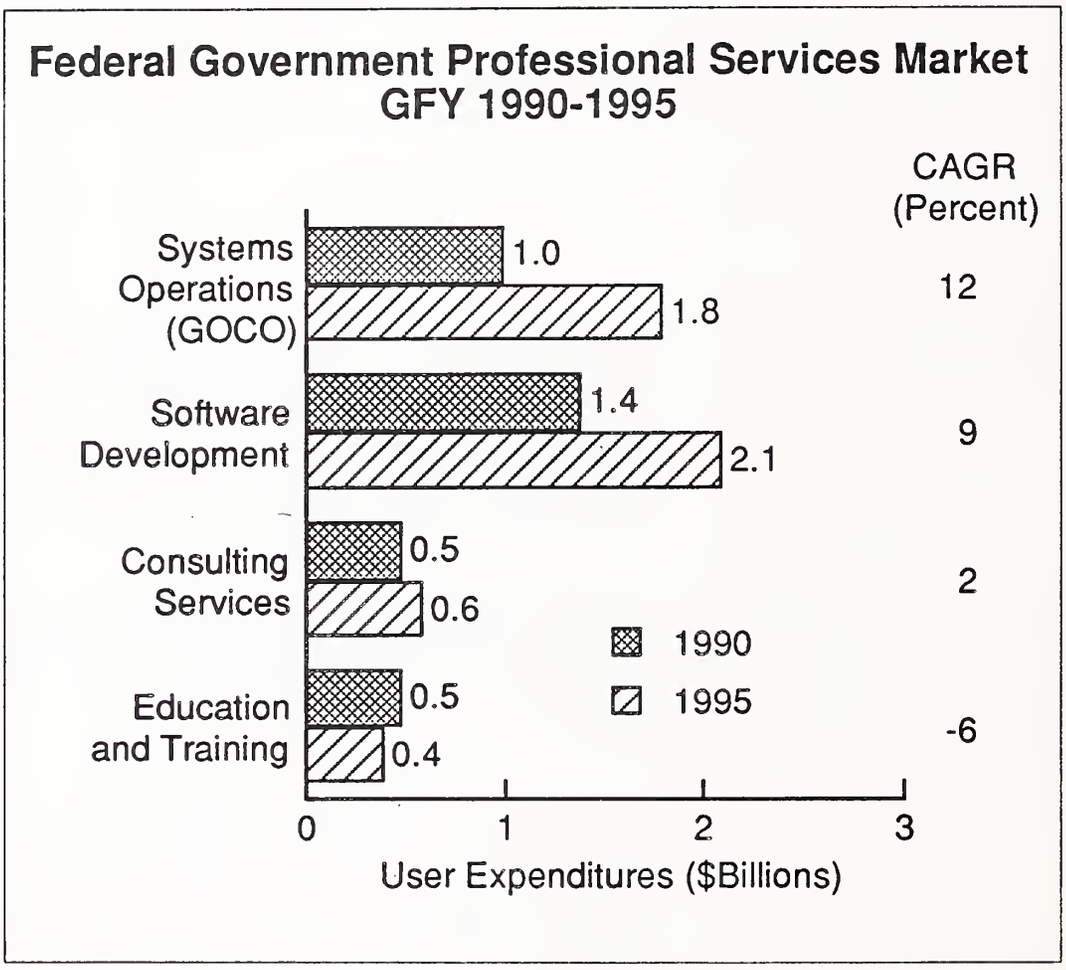
Professional services have a variety of task names. Professional services are defined by INPUT and discussed in the following categories (also see Appendix B):

- Systems Operations (facilities management); for example, Government-Owned/Contractor-Operated (GOCO) projects
- Consulting Services

© 1990 by INPUT. Reproduction Prohibited.

- Education and Training
- Software Development

EXHIBIT III-1



1. Systems Operations (FM)

Systems operations or professional services facilities management (PSFM) is also referred to as GOCO (Government-Owned/Contractor-Operated) information systems. The computing equipment is owned or leased by the government, not the PSFM vendor; the vendor provides the staff to operate, maintain, and manage the government's facility. GOCO also includes operations and maintenance (O&M) contracts, which differ from PSFM in that vendors have less or no direct management/control of the facility. Both second- and third-party maintenance is included. Typical contract tasks included in this submode are:

- Operation and management
- Hardware maintenance

© 1990 by INPUT. Reproduction Prohibited.

- Software maintenance
- Site preparation and installation

In INPUT's Market Analysis Program (MAP) report on the federal sector, hardware and software maintenance were treated separately. However, hardware and software maintenance were treated as one category in the federal report, in response to client preferences.

The GOCO market is mostly responsible for growth in the professional services market. The systems operations (GOCO) market will grow from $1.0 billion in GFY 1990 to $1.8 billion in GFY 1995. Although the growth rate for this portion of the market decreased to 12% (from 15% last year) for this period, GOCO shows the greatest growth rate for professional services. Agencies still have difficulties hiring and retaining technically competent employees, and that drives the need for systems operations services.

The market growth is also probably encouraged by the growth in the commercial side of the systems operations market. Many commercial firms are now turning to outsourcing for their systems support, and the federal government often looks to the private sector for inspiration. This is ironic because traditionally the federal government has been more willing to relinquish control of computer facilities.

A related information services market is COCO (Contractor-Owned, Contractor-Operated). COCO is the management of all or part of a user's data processing functions under a long-term contract of not less than one year. This would include remote computing and batch services. To qualify, the contractor must directly plan, control, operate, and own the facility provided to the user—on-site, through communications lines, or in a mixed mode. INPUT does not include COCO as part of the professional services market, putting it instead under processing services.

The federal COCO market will grow from $306 million in GFY 1990 to $550 million in GFY 1995. This is a compound annual growth rate of 12%. Market growth is supported by the continuing trend in the federal government to contract out many lower level, labor-intensive activities. Traditionally, many scientifically oriented activities, such as those at NASA and the Energy Department, have contracted out their mission work. Other agencies contract out their administrative systems operations, while retaining the mission activities for government employees. The COCO market is treated in greater detail in a companion INPUT FISSP report, Federal Processing Services/Systems Operations Market. That report was published in 1989.

© 1990 by INPUT. Reproduction Prohibited.

2. Consulting Services

Consulting services in the federal market include information systems and/or services management consulting, program assistance (technical and/or management), feasibility analysis, and cost-effective trade-off studies. Examples of government consulting services contracts are:

- Feasibility studies
- ADP requirements analysis
- System audits
- System Engineering and Technical Direction (SETD)
- System Engineering and Technical Assistance (SETA)

It also includes the initial design of systems, as well as the Independent Validation and Verification (often referred to as IV&V) of newly installed systems. System development, however, is included in the software development category.

Consulting services will grow from $500 million in GFY 1990 to $560 million in GFY 1995, at a CAGR of 2%. This is a small decrease from last year's predicted growth rate of 3%.

Congressional pressure is forcing down the amount of consulting services that agencies can use. There are some in Congress who believe that the government contracts out services that should be done by government personnel, thus creating a "shadow government." Pending bills in Congress could potentially reduce the amount of consulting allowed in the agencies, and these bills have been taken into account in developing this forecast.

Budget constraints are preventing defense agencies from contracting out their consulting. This becomes especially apparent on mission-oriented programs (such as weapons systems) that are stretched out.

3. Education and Training

Education and training services relate to information systems and services for the user, including CAI (computer-aided instruction), CBE (computer-based education), and vendor instruction of user personnel in operations, programming, and software maintenance. The government normally contracts for:

- Training programs
- Books and manuals
- Seminars
- Automated training systems

© 1990 by INPUT. Reproduction Prohibited.

The education and training market will shrink from $460 million in GFY 1990 to $370 million in GFY 1995, at a compound rate of -6%. This decline is due to a number of factors, including:

- In times of severe budget constraints, training and travel are usually the first items to be cut.
- As more technical functions are contracted out, the number of federal personnel requiring technical training is gradually declining.
- To the extent that agencies choose training methods other than the traditional classroom approach, unit training costs decline sharply.
- Despite mandated training under the Computer Security Act, most agencies have provided little or no security training to their personnel.

Expansion of existing systems to more end users, hardware and software upgrades, and new forms of technology (such as image systems) are fueling the need for additional IS training programs for users and systems support personnel.

Already agencies are forced to rely on contractor assistance to train major portions of agency personnel. Current dependence on contractors to provide IS training is also expected to increase, based on projections of future federal training needs. A report entitled *Civil Service 2000* recently issued by OPM, cites retraining of existing IS personnel and other workers as the primary avenue for the government to meet staffing requirements in the near future. Agencies must develop programs to better utilize the work force they do have by retraining them to develop new and polish old skills. The national work force is expected to grow by only 1%, and combined with a less competitive pay scale, federal agencies will be even less able to attract qualified technical personnel.

The federal government continues to face a mounting budget deficit crisis. Noncritical expenditures, such as training and travel, will increasingly be limited. Funding problems are not expected to abate in the near future. Although agencies will feel increased pressure to provide more IS training, budget requests for these services will have difficulty obtaining support.

This market is covered in more detail in a companion INPUT FISSP report, *Federal Education and Training Market*. The report is scheduled for publication in late 1990.

4. Software Development

Programming and analysis services, also called software development, include system design, contract or custom programming, code conver-

© 1990 by INPUT. Reproduction Prohibited.

sion, benchmarking, and software maintenance. The government usually contracts for:

- Hardware and/or software system design
- Custom software development
- Modification of off-the-shelf software products
- Software testing of custom-developed and commercial packages
- Software conversion
- Maintenance of operating and applications software

Software development will increase from $1.4 billion in GFY 1990 to $2.1 billion in GFY 1995, a CAGR of 9%. This is a slight increase from last year's forecast. This rate, however, is much lower than the software development growth of earlier years. During the mid-1980s, the software development growth rate was around 22%. Program rescheduling and reductions in ongoing contracts reflect agency efforts to retain in-house staffs. The shortfall in programming skills of the federal government sector will continue to be the most significant factor behind the projected growth in the out-years. Government staff limits and the backlog of software maintenance tasks at most government data centers also contribute to the demand for vendor assistance in this service mode.

OMB's continuing emphasis on software products, standardized software, and agency sharing is holding down growth in this market. Further, the growing viability of programmer workbench products and other productivity tools will help to reduce the cost of new software being developed.

In previous *Federal Professional Services Market* reports, INPUT included a fifth category—the professional services portion of systems integration. This submode was also included in the systems integration report. Beginning with last year's report, INPUT now includes this item only in the *Federal Systems Integration Market* report, now separately published and updated.

C

Vendors of Professional Services to the Government

1. Rank of Leading Professional Services Vendors

Exhibit III-2 lists the top professional services vendors to the federal government during 1989. Although the listed vendors do not fluctuate dramatically from year to year, rankings do. The continually changing demands for different services and the patterns of vendor teams for different programs make a complicated competitive structure. Very frequently, today's bidding partners are tomorrow's competitors. Employee changes make a difference in the rankings as well. A skilled and experienced leader can change the stature (and ranking) of a vendor in a relatively short time.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT III-2

Top Federal Government Professional Services Vendors, 1989

Company	Revenue ($ Millions)
1. Computer Sciences Corporation	300.0
2. Unisys	120.0
3. Black and Decker	107.0
4. Martin Marietta	100.0
5. Grumman Data Systems	99.5
6. Computer Data Systems Inc.	99.1
7. Electronic Data Systems	99.0
8. Centel Federal Systems	87.0
9. IBM	65.5
10. Syscon	60.0
11. Mitre	48.5
12. BDM	47.4
13. Oracle	45.5
14. SAIC	42.3
15. Softech	35.0
16. Sterling Software	31.4
17. OAO Corporation	29.2
18. CBIS	25.5
19. Control Data Corporation	22.0
20. American Management Systems	21.0

© 1990 by INPUT. Reproduction Prohibited.

The companies ranked in Exhibit III-2 are leading professional services vendors. However, some firms that normally would be expected to be a leader in this market are not listed. Boeing Computer Services, Systemhouse, and TRW all chose to list much of their federal revenue under the heading of systems integration. That is why their names do not appear in the list of leading professional services vendors. It also explains why other firms with high overall federal revenue are ranked relatively low in the list of leading professional services firms. These firms also chose to list a large amount of their revenues in areas other than professional services.

2. Vendor Profiles

The remainder of this section is devoted to short profiles on each of the vendors listed in Exhibit III-2. The profiles examine the relative strengths of each firm, major contracts it has won, and other facts. This information will provide basic knowledge of each leading professional services company.

a. Computer Sciences Corporation (CSC)

CSC was founded in 1959 and for the 1990 fiscal year had revenues of over $1.5 billion. CSC currently has 22,000 employees worldwide. Over the past 5 years CSC won 54% of the contracts that it bid on.

CSC collected $993 million in revenue from the federal government in fiscal 1990. This is an increase of 11% from the previous fiscal year. Revenue from the federal government represented 66% of total revenues from continuing operations, compared with 73% the prior year. This decrease reflects the rapid growth of CSC's commercial and international activities, rather than diminished federal demand for CSC services.

CSC's Systems Group is the entity that primarily provides services to the federal government. The Systems Group has five operating divisions.

The System Sciences Division—headquartered in Silver Spring, Maryland—provides support to NASA, FAA, and basic technology services. The Applied Technology Division—in Falls Church, Virginia—provides facilities management, range operations, maintenance, and information sciences services. The Integrated Systems Division—headquartered in Moorestown, New Jersey—provides total turnkey systems engineering and software system support for major government systems. The Network Systems Division—in Falls Church, Virginia—specializes in the implementation of wide-area data communications networks and remote data telemetry systems. Finally, the Special Projects Division—in Falls Church, Virginia—provides systems engineering and technical assistance (SETA) services to a broad client base and offers specific emphasis on communications and software support.

© 1990 by INPUT. Reproduction Prohibited.

CSC won a large contract from the U.S. Postal Service to help increase the efficiency of mail processing and administrative functions. CSC will provide system design and development for fully automated, self-service retail postal centers intended as part of the "Post Office of the Future," and bar coding software to meet the postal service's goal of automated processing of all mail by 1995.

At the end of fiscal year 1990, CSC won two major contracts: System 90 from Treasury and TOSS from EPA. TOSS (Technical and Operating Support Services) is worth $54 million in the base year and could be worth $347 million if the government exercises all options. Unisys formerly held this contract. System 90 is a contract for professional services and telecommunications equipment to link the Financial Management Service headquarters and the seven Regional Financial Centers. The base value of the contract is $48.8 million, but could be worth up to $90 million if the Treasury exercises all of the options on the contract. However, the contract has been protested, so the award may be reversed.

CSC's Applied Technology Division was awarded a $48 million contract in August 1990 from GSA to provide system development and software support services for scientific and engineering applications in GSA's Pacific Zone.

Earlier in 1990, NASA selected the Applied Technology Division for a $65.7 million contract to provide engineering support services for the Wallops Island facility. CSC will support sounding rocket, balloon, and aeronautical programs and support launch range projects.

More recently, CSC was awarded the System 90 contract by the Financial Management Service of the Department of the Treasury. The first year of the contract is worth $22.3 million, and there are options for nine annual renewals, totalling approximately $48.8 million. CSC's Integrated Systems Division will replace and integrate hardware and software systems at the agency's seven regional financial centers and the National Computer Center. At this writing, Andersen Consulting has filed a belated protest on System 90, charging that CSC priced its proposal so low that it cannot possibly meet the requirements of the specification.

The Applied Technology Division won a $65.2 million contract from Army TRADOC in September 1990. CSC has hundreds of contracts throughout the federal government.

CSC anticipates continued growth in the federal government market. CSC has identified more than $14 billion in contracts that match their capabilities and are slated for award over the next three years.

© 1990 by INPUT. Reproduction Prohibited.

b. Unisys

Unisys has approximately 78,000 employees. Unisys had a very difficult 1989. It reported a $639 million loss and had to cut more than 8,000 jobs. Part of the loss resulted from a $231 million restructuring of debt in October. However, in July 1990 Unisys still reported a $45.1 million loss in the year's first half after paying preferred-stock dividends. In the autumn 1990 bear market, Unisys' share price on common stock fell below $4.

Defense spending accounts for about 22% of Unisys' revenue. However, much of this revenue is not for professional ADP services activities. Unisys performs many projects oriented toward weapons systems.

Unisys was awarded a contract by NASA in June 1990 for business, administrative, and management information support services. The contract is worth over $20 million and is anticipated to run for five-years. Unisys will provide application software development, software maintenance, end-user support, technical support, computer operations, and hardware maintenance.

Unisys also runs the Scientific Computer Operations center at NASA's Langley Research Center. Unisys was awarded a contract in September 1988 for approximately $27.1 million. Over a five-year period Unisys will provide systems operations and support services.

Unisys provides facilities management for the EPA at the National Computing Center in Research Triangle Park, NC. This five-year contract is worth approximately $19 million.

The Department of Transportation's Research and Special Programs Administration awarded Unisys a contract in 1987. Under the five-year contract, Unisys provides applications programming, computer operations, systems planning, and software maintenance. The contract has been valued at $125 million.

Unisys has moved to open systems and is trying to become expert in particular businesses and providing specialized software. In late 1989 Unisys announced an array of new LINC and MAPPER CASE/4GL products. Unisys is committed to implementing an open UNIX and CASE/4GL environment. Unisys also intends to work with major CASE suppliers worldwide to interface their CASE tools with the Unisys LINC application development system. ALLY is Unisys' third CASE/4GL product, which offers color presentation capability and a software-independent environment. ALLY users can develop applications quickly on UNIX, MS/DOS, and OS/2 and can work with data bases such as ORACLE and Informix.

© 1990 by INPUT. Reproduction Prohibited.

c. Martin Marietta

During 1988 Martin Marietta had $5.7 billion in sales. The Information Systems group had $997.8 million in sales during the year. In 1989 the Information Systems group had $747.9 million in sales. The Information Systems group, which consists of seven business areas, provides systems integration, professional services, and systems design services to the federal government and other markets.

Information and Communications Systems designs, develops, produces, and operates systems that use advanced hardware and man/machine interface technologies for defense and nondefense purposes.

Simulations Systems designs, develops, and installs large-scale distributed simulation and modelling systems. Simulation Systems has designed and is operating the National Test Bed, which is a nationwide state-of-the-art computer simulation system for test and evaluation of strategic defense concepts, architectures, battle management, and technology applications.

Civil Information Systems designs, develops, and integrates multifunction administrative and operational large-scale systems for federal, state, local, and foreign governments. In addition, electronic data interchange and remote computing services are offered to government and industry via three data centers.

Air Traffic Systems designs, integrates, and implements civilian and military air traffic control systems and provides airport management services.

Facilities Management & Professional Services provides facilities and program management at the customer site, including systems development, installation, implementation, operations, and maintenance. This unit also supplies various technical professionals on a task-by-task basis for specialized client requirements.

Internal Information Systems is Martin Marietta's principal management information systems supplier, providing applications systems, computer resources, and communications systems to the corporation and its operating companies.

The Production, Assembly, and Test Facility, a newly emerging technology, is designed to handle diverse production requirements and provides a necessary testing ground for the company's latest manufacturing needs.

Martin Marietta provides teleprocessing services for the National Agricultural Statistics Service (NASS), an agency of the Department of Agriculture. The eight-year contract, awarded in September 1989, is

© 1990 by INPUT. Reproduction Prohibited.

worth $35.9 million. Martin Marietta provides a nationwide teleprocessing network that, along with other benefits, ensures the security of sensitive data.

Martin Marietta also provides ADP support services to the Western Area Power Administration (Department of Energy). This contract, awarded in March 1989, is valued at $4.9 million.

Martin Marietta provides systems operations (GOCO) services to several government sites.

d. Grumman Data Systems

The Grumman Corporation was founded in 1929 and the Data Systems group is one of many divisions. Founded in 1969, the Data Systems Division had $350 million in revenue in 1989. The division has 2,800 employees.

Although Grumman Data Systems (GDS) experienced flat revenues in 1987, it had $309 million in sales in 1988. That year GDS won several large contracts, including the Air Force Depot Maintenance Management Information System, the Air Force and Office of the Secretary of Defense management information system, and the Marine Corps Advanced Tactical Air Command Central program.

This year GDS won two major contracts involving professional services. In December 1989 the Defense Logistics Agency awarded GDS a $60.7 million contract. GDS will provide a modernized system to support all logistics functions through collection, processing, storage, and dissemination of data. The system is known as the Defense Integrated Data System (DIDS).

In April 1990 the Office of Naval Research awarded GDS a contract to install a Class VII supercomputer at the Naval Oceanographic Office in Mississippi. The contract is worth $40.9 million, and there is also an option to install another Class VII supercomputer at the Fleet Numerical Oceanographic Center in Monterey, California.

GDS has a large array of services to provide potential customers. GDS provides custom software design, systems integration and engineering, systems evaluation, feasibility studies, requirements analysis, training, operations, and maintenance. GDS will use these skills to primarily pursue large-systems integration contracts.

e. Computer Data Systems Inc. (CDSI)

CDSI was founded in 1968 and currently has 2,800 employees. CDSI's revenues for the fiscal year ending June 30, 1989, were $105.4 million.

© 1990 by INPUT. Reproduction Prohibited.

CDSI provides professional and processing services, systems integration, proprietary financial software products, CASE tools, and turnkey systems. Nearly 90% of CDSI's revenue comes from the federal government. CDSI's operations are conducted through three major groups.

The Professional Services Group provides life cycle capabilities in systems development, telecommunications, financial systems, office automation, and facilities management services. This group includes three divisions: The Government Services Division, the Information Systems Division, and the Energy Systems Division.

The Systems Engineering Group provides a range of computer and telecommunications systems engineering, information security and risk analysis, and logistics support to the DoD and other federal clients through contracts with the GSA. Services include life cycle development; systems analysis, design, and development; training; and quality assurance. This group includes two divisions: The Defense/Aerospace Systems Division and the Technology Services Division.

The Data Processing Support Services Group provides financial software products, CASE products, turnkey systems, clearinghouse operations, systems integration, and full-service processing to federal, state, and local governments and commercial clients. There are six divisions within this group: The Financial Systems Division, the Union Systems Division, the Clearinghouse Division, the Data Systems Division, the Software Productivity Tools Division, and the Systems Integration Division.

CDSI has several major contracts with various government agencies. CDSI has contracts with Energy, Justice, GSA, HUD, Labor, Navy, Interior, Agriculture, Treasury, Transportation, Army, and others.

f. Electronic Data Systems (EDS)

EDS was founded in 1962. EDS had income of $435.3 million in 1989, up from $384.1 million in 1988. Although most of EDS' revenue results from its General Motors business, the EDS Government Systems Group produced 14% of the company's revenue in 1988. The Government Systems Group includes business from state and local governments as well as the federal government. EDS currently has 56,000 employees worldwide.

EDS is trying to expand its commercial manufacturing base outside of its parent company. EDS provided funding for ASK Computer Systems' acquisition of Ingres Corporation. This will give EDS access to ASK's manufacturing software as well as Ingres' data base and software development tools. EDS also acquired equity in other companies that adds to EDS' business base and expands its access to technology. These companies include System One, Westwood, Thomas, and Infocel. Last year,

© 1990 by INPUT. Reproduction Prohibited.

EDS and Hitachi combined to acquire National Advanced Systems, which was renamed Hitachi Data Systems (HDS). EDS has a 20% holding in HDS.

EDS is known as a leader in providing systems integration to the federal government. EDS uses its expertise in professional and technical services to go after high-profile projects. EDS won several large federal contracts during fiscal 1990.

In October 1989 the Immigration and Naturalization Service awarded a $3.25 million contract for facilities management services to EDS. Almost one year later, in September 1990, the INS awarded an even larger contract to EDS. EDS will provide facilities management services over several years for $64.4 million.

The Defense Supply Service - Washington (DSSW) also awarded a large contract to EDS. On December 1, 1989, DSSW gave EDS a contract worth $5.24 million to supply ADP technical support services.

In January 1990, the Agricultural Stabilization and Conservation Service awarded EDS a $12.4 million contract. EDS will operate and maintain the Cotton Inventory Management System for ASCS.

On July 31, 1990, the Army awarded EDS a contract worth $116.25 million. EDS will provide technical support services to the Army ISSC. EDS won a huge contract from the Army in late July for the Small Multi-User Computer (SMC) project. This contract is valued at approximately $715.9 million. EDS will supply microcomputers, peripherals, operating software, maintenance, training, engineering services, and LANs that run under GOSIP. The contract will be used as a vehicle for the Army, Navy, and DLA to acquire hardware, software, and services for different programs. EDS has several ongoing contracts with the federal government, especially the Army, that provide it with a steady stream of revenue.

g. Centel Federal Systems

Early in 1988, Centel Federal Systems was separated from Centel Information Services into a distinct operating unit to more effectively address the computer systems and services marketplace in the government sector. Centel Federal currently operates within Centel Corporation's Business Systems segment, which also includes Communications Systems and Information Systems.

Centel Federal Systems' 1989 revenue reached approximately $110 million, a 100% increase over 1988 revenue of approximately $55 million. One hundred percent of Centel Federal Systems' revenue is

© 1990 by INPUT. Reproduction Prohibited.

derived from systems integration and other services provided to the federal government. Centel Federal has about 400 employees.

Examples of Centel Federal's contracts include the GSA SETA contract for FTS 2000. This contract was awarded in 1988 and is worth about $29 million. Centel also provides office automation support to the Internal Revenue Service, various services for the U.S. Postal Service, operation and maintenance and library support services for the Department of Justice, and ADP support services to NOAA.

h. Black & Decker

Black & Decker is the parent company of Planning Research Corporation (PRC) and Advanced Technology, Inc. (ATI), which are now merging. Black & Decker recently reported profits in the third quarter of 1990 and for the first nine months of the year. Profits totaled $44.3 million in the first nine months, compared with an $8.3 million loss in the same period of 1989. Its operating earnings rose due to better manufacturing efficiency, cost controls, and cost savings after it finished integrating Emhart's operations into its own.

PRC was founded as a private company in 1954 to perform systems analyses and operations research for the Department of Defense. Beginning in 1964 as a public company, PRC began a rapid diversification program primarily through expansion.

PRC was acquired by Emhart Corporation in October 1986 for approximately $220 million. Emhart was acquired by Black & Decker in April 1989. Black & Decker is currently merging PRC and the other Emhart information technology holding, Advanced Technology Incorporated, to form PRC Incorporated. The merger will be complete in January 1991.

PRC's total 1988 revenue reached $483.6 million. PRC has 6,500 employees spread over three information systems and services groups. The Business Information Systems group provides nationwide, computer-based multiple listing services (MLS) for real estate brokers, computerized systems for physicians in group practices, and computer-aided dispatch systems. The Systems Services group is focused on professional and technical services in support of the engineering and information systems requirements of government agencies. The PRC Government Information Systems group provides analysis, design, development, and implementation of information handling and data processing systems.

PRC applies a full range of systems analysis and multidisciplinary skills to systems for turnkey information processing, telecommunications, network and distributed data base management, on-line management information, command and control, intelligence data handling, real-time process control and data acquisition, tactical data, electronic warfare,

© 1990 by INPUT. Reproduction Prohibited.

regulatory information, logistics, Ada programming, and artificial intelligence.

Some of PRC's major federal contracts include two within the Department of Commerce. The first is the PTO Automation project, which is a multiyear systems integration contract. The second is the Advanced Weather Interactive Processing System for the 1990s (AWIPS-90). PRC and CSC are both in the definition phase of the project. Only one of the companies will be allowed to continue on the development and implementation portion of the project.

Advanced Technology Inc. (ATI) was founded in 1976 and provides professional services, systems integration services, and software support. ATI was acquired by Emhart Corporation on December 31, 1987, for $140 million. Black & Decker then acquired Emhart in early 1989. ATI's total 1988 revenue reached $172 million.

ATI designs, develops, implements, integrates, and maintains information systems primarily for DoD applications. ATI is involved in CALS, the DLA core systems project, Total Army Personnel System (TAPSYS), long-range planning for HCFA, C3I systems, combat systems, aerospace systems, submarine systems, and SETA services.

i. IBM

Most of IBM's revenue from the federal government comes from systems integration projects. IBM had approximately $500 million in systems integration revenue last year. As for professional services, much of IBM's revenue is from maintenance of hardware systems that it has installed. Other sources of IBM's professional services revenue include system upgrades, application modifications, systems engineering modifications, technical support, and logistics support.

j. Syscon

Syscon Corporation was founded in 1966 and primarily provides system development, systems integration, and system services. Syscon has 1,800 employees. Syscon operated as a public corporation until December 1986 when it was acquired by Harnischfeger Industries for $92.1 million. Syscon now operates as a wholly owned subsidiary of Harnischfeger Industries.

In fiscal 1988, Syscon had about $149.8 million in revenue. About 70% of this revenue was from professional services. Twenty percent of the revenue came from systems integration services, and 10% came from software products, turnkey systems, and processing services.

Syscon's major business concentration is on the development of complex systems for the Department of Defense. Syscon provides computer

© 1990 by INPUT. Reproduction Prohibited.

programs used by the military in its training, logistics, business management, and mission critical systems. Ada is used by Syscon to develop software.

Syscon is involved in the Modern Aids to Planning Program (MAPP), an initiative of the Joint Staff. The goal of MAPP is to acquire state-of-the-art hardware and software and to employ modern wargaming, simulation, and analysis methodologies.

Syscon provides several types of software to the federal government. The Computer Assisted Maintenance Management System (CAMMS) provides logs and records management, tracks discrepancies, and generates work orders and reports. CAMMS is used for the maintenance of the Navy's T2C aircraft.

SKETCHER is an Ada software design tool that allows on-line interactive generation of object-oriented design diagrams (OODDs) which represent high-level Ada entities and the program design language that correspond to the OODDs drawn.

217 PREDICT is a software package that Syscon has marketed since 1980 in various forms. 217 PREDICT aids the DoD in predicting the reliability of electronic and mechanical systems. 756 PREDICT is software that provides system reliability predictions in compliance with system-level modeling requirements of MIL-STD 756.

Syscon has some contracts, which are mostly for systems operations services, with the civilian side of the federal government.

k. The Mitre Corporation

Mitre was founded in 1958 and is headquartered in Bedford, Massachusetts. The company had over $500 million in revenues last year—an increase of 38% from three years ago—and has 6,100 employees. The President and Chief Executive Officer, Charles A. Zraket, is retiring this year.

Mitre is a nonprofit company that provides systems engineering, management consulting, and management engineering services. Mitre has contracts with numerous federal agencies, both in the civilian and defense sides. Mitre is often contracted when an objective source is needed for a study or for support services. It does not participate in competitive procurements.

Examples of recent Mitre contracts include integration support services for development of the target architecture for the IRS Tax Systems Modernization effort. This contract, awarded in June 1990, is worth

© 1990 by INPUT. Reproduction Prohibited.

$750,000. Mitre was awarded a $3.4 million contract in July 1989 by GSA. This contract is for telecommunications management support for FTS-2000. In December of 1989, GSA awarded an additional $37.6 million in support of the contract.

In November 1989, Mitre was awarded a $500,000 contract by the Drug Enforcement Agency for technology infrastructure assessment and technology base enhancement services. As a final example, NASA Johnson Space Center awarded Mitre a $10.1 million contract in January 1989 for information systems acquisition support.

l. BDM

BDM was recently acquired by The Carlyle Group from Loral Corporation for $130 million. The Carlyle Group had attempted to acquire Ford Aerospace but lost in the competition to Loral. BDM was previously owned by Ford Aerospace. The Carlyle Group is headed by former Defense Secretary Frank Carlucci. Carlucci will become chairman of BDM, but there will be few other personnel changes there.

Only two years ago, Ford Aerospace paid $425 million to acquire BDM. The decrease in the value of BDM is due to industry concern about how declining defense budgets will affect systems integrators like BDM.

BDM had $342 million in sales in 1989, and 80% of its revenues were derived from federal contracts. BDM has 3,000 employees. BDM specializes in enterprisewide network design and integration, facilities management, LAN integration, needs assessment, and training. BDM services the federal government market, banking and finance, manufacturing, telecommunications, state and local government, and transportation. BDM performs many studies and analyses in the areas of command and control, manpower assessments, and force assessments.

BDM is the prime contractor on the SEC's EDGAR (Electronic Data Gathering, Analysis, and Retrieval) system. The eight-year contract is worth $54 million. They also have the lead on the Air Force's 10-year, $220 million Requirements Data Bank project. This contract is the largest in BDM's history.

m. Oracle

Oracle develops, markets, and supports software products used for data base management, applications development, decision support, and computer network communications. The company's principal product, the ORACLE relational DBMS, is a SQL-based system that runs on almost every type of hardware platform in existence.

© 1990 by INPUT. Reproduction Prohibited.

Oracle was founded in 1977 as Relational Software, Inc., but changed its name in January 1983 to better identify with its well-known principal product. For the 1990 fiscal year, Oracle's revenues increased by 66% to $971 million, compared to $584 million the previous year. However, for the quarter ended August 31, 1990, Oracle posted its first-ever quarterly loss. Oracle responded to this loss by cutting 10% of its staff. Oracle currently has approximately 5,500 employees.

In June 1988, Oracle entered the systems integration business with the formation of its subsidiary, Oracle Complex Systems Corporation (OCSC). The business was expanded later in 1988 with the acquisition of Falcon Systems, Inc., for $13.7 million in cash and $4.6 million in notes.

Oracle's principal product, the ORACLE relational data base management system, allows users to define, retrieve, manipulate, and control data stored in a computer using the SQL nonprocedural language. ORACLE was designed and written to make it adaptable to most computer hardware and operating systems. This portability allows customers to use the same data base management software and user interface on all their machines. This is a very attractive feature for the federal government agencies, which often have many types of machines in any given office.

Oracle offers several applications development productivity tools and decision support products for use with ORACLE. Oracle also offers the Pro* series of six tools that allows a programmer to access an ORACLE data base using SQL from programs written in traditional programming languages.

Oracle provides systems integration services through its Oracle Complex Systems Corporation subsidiary. Oracle provides consulting services, and training and education services in support of customers' use of the company's software products.

n. SAIC

SAIC was founded in 1969 and currently has about 9,000 employees worldwide. SAIC offers diversified research and engineering services as its primary product. The company is employee owned. About 90% of SAIC's revenue is derived from the U.S. government. SAIC's total revenues for fiscal 1989 were $865 million, and there is about $3 billion in back orders.

There are several operating sectors within SAIC. They include the Advanced Technology & Analysis Sector; the Aerospace & Defense Sector; the Communications, Information, & Space Sector; the Science & Engineering Sector; the Space Energy & Environment Sector; the Sys-

© 1990 by INPUT. Reproduction Prohibited.

tems Technology & Integration Sector; the Systems, Software, & Telecommunications Sector; and the Technology, Policy, & Operations Sector. Each sector is broken into several groups. There are also several independent groups.

SAIC is a contributor to the Department of Defense's Ada Software Technology for Adaptable and Reliable Systems (STARS) programs. SAIC fielded the first operational WWMCCS system in Ada. SAIC also developed the Automated Message Handler for the Joint Intelligence Tactical Communications System using Ada.

In October 1989 the Army awarded SAIC a contract for Information Mission Area (IMA) support. The initial contract value was $51.7 million. To date, there have been at least 27 delivery orders on the contract.

The Defense Communications Agency awarded a contract worth $20.6 million to SAIC in March 1990. SAIC is providing technical assistance for the Strategic C3 Connectivity project.

SAIC was awarded a contract for $84 million by the Department of Veterans Affairs in 1989. This contract, known as the Integrated Data Communications Utility, will run for 10 years. The system will link remote, widespread VA networks.

SAIC is increasing its number of bids for commercial systems integration jobs. The company is trying to leverage its experience on the Department of Defense Composite Health Care System (CHCS) contract in the commercial medical information systems market. It also acquired several medical firms with commercial expertise to enhance its offerings in the health care information systems market.

SAIC operates a data center for the Defense Advanced Research Projects Agency (DARPA). The center is for the monitoring of worldwide seismic data. In total, SAIC operates 20 data centers for three federal clients.

SAIC is also targeting commercial systems integration for television stations, process control in manufacturing, and pharmaceutical contracts. This increase in the pursuit of commercial business is likely due to the belief that federal business availability will decline.

o. Softech

Softech was founded in 1969 and is headquartered in Waltham, Massachusetts. In 1989, Softech had $49.2 million in sales, showing almost no growth from the previous year. Softech has 600 employees, including 100 at the headquarters location.

© 1990 by INPUT. Reproduction Prohibited.

Softech provides custom software development, systems engineering, and systems integration services to government agencies and Fortune 500 companies. The major portion of Softech's business is with the Department of Defense.

Softech is organized into three operating groups and two subsidiaries. The Federal Systems Group focuses on the design of systems software tools and applications for embedded computers. The Government Systems Group focuses on developing systems software, applications, and software methodologies for the U.S. Navy and Air Force. This group includes the operations of AMG Associates, which provides custom software and related services for automatic test equipment. The Systems Sciences Group focuses on software verification and validation, advanced software engineering, standardized language support, and simulation. COMPASS, Inc., provides compiler software and professional services in the supercomputer and advanced architecture computer marketplace.

Since 1975, Softech has been working with all facets of Ada. The company participated in the early studies that identified the Ada language requirements. Softech has teamed with Boeing Aerospace under a five-year contract for the Software Technology for Adaptable and Reliable Systems (STARS) program.

In the area of logistics systems, Softech has performed numerous contracts for the Air Force Logistics Command (AFLC) and the Defense Logistics Agency. Softech is currently a subcontractor to Litton on a 12-year AFLC contract to develop the Reliability and Maintainability Information System (REMIS). During fiscal 1989, Softech won a five-year, $18 million support services contract from the AFLC to provide systems engineering, logistics systems analysis, communications systems design, and related services.

Softech is subcontracting to EER, Inc. to provide independent verification and validation services to the Army Information Systems & Engineering Command. Softech also provides a range of engineering support services in the area of avionics systems integration and airborne electronic warfare.

p. Sterling Software

Sterling's Federal Systems Business provides development, network development, and systems operations professional services—generally under long-term contracts—that support both military and nonmilitary projects. The company has two units. One is the Federal Systems Group that has two divisions—the Intelligence and Military Division, which provides highly specialized communications products, and the Systems and Scientific Division, which provides software development and support services to the NASA Ames Research Center. The other unit is

© 1990 by INPUT. Reproduction Prohibited.

ZeroOne Systems, which specializes in the design and operation of supercomputer data centers.

Revenue for fiscal 1988 reached $72.2 million. Most of the company's revenue comes from the NASA Ames Research Center. Sterling recently won a battle royal with CSC over the programming support services contract at the center, and will hold the contract for another five years. ZeroOne has been responsible for the development and operation of the Advanced Computational Facility at Ames since 1981.

q. OAO Corporation

OAO was founded in 1973 and provides a broad range of professional services, which include systems development, integration, conversion, and maintenance; operations support; training; and systems operations. OAO's initial business was with NASA, but OAO has expanded its business base to provide services for several other federal government agencies. OAO currently has 900 employees and is a minority owned corporation.

Recent examples of contract awards to OAO include a $7.9 million contract from the Air Force. For this project, OAO will provide engineering services and applications to the Navstar System.

Part of OAO was recently purchased by Cincinnati Bell Information Systems (CBIS). CBIS had lost an IRS support services contract to OAO, and CBIS bought the division of OAO that was working on the contract.

r. Cincinnati Bell Information Systems (CBIS)

CBIS is a subsidiary of Cincinnati Bell Incorporated. The company has 3,700 employees and in 1989, had $304 million in revenue. CBIS is a relative newcomer to the federal market but has extensive experience in banking and finance, business service, manufacturing, retail, and telecommunications. The former Vanguard Technologies Group accounted for almost all of CBIS' federal revenues.

CBIS and Recognition Equipment Inc. (REI) have together produced products for a high-speed image system for the financial industry. CBIS developed mainframe-based software for check processing. Several more applications will be developed by the two companies.

CBIS acquired Vanguard Technologies in 1988. Vanguard won several federal professional services contracts in the past, especially in the area of systems operations. Vanguard has contracts with the departments of Justice, Agriculture, and Interior, among other agencies.

© 1990 by INPUT. Reproduction Prohibited.

CBIS was awarded a contract in July 1990 by GSA for technical support services. CBIS provides business programming services to all federal agencies in a given geographic zone. The contract is valued at $78.1 million. However, this contract was protested successfully by Planning Research Corporation. PRC stated that CBIS unfairly undercut other bidders on labor costs, and the General Services Board of Contract Appeals (GSBCA) agreed.

The Department of Agriculture awarded a $79.7 million contract to CBIS in August 1990. CBIS provides information resources management support services to the Farmer's Home Administration.

s. Control Data Corporation (CDC)

CDC was founded in 1957 and is headquartered in Minneapolis, Minnesota. CDC is known for its computer hardware but also provides hardware maintenance, operating systems software, systems integration services, and systems operations services. CDC had $2.9 billion in sales in 1989, which is down from $3.6 billion in 1988. CDC attempted to cut its losses by selling off several of its businesses and reducing staff in 1989 and in 1990, but the losses continue.

CDC is now emphasizing its businesses as standalone units, each having an identity, market, and responsibility for building competitive advantage. CDC has three main divisions: Information Services, Computer Products, and Government Systems. Government Systems supplies computer systems, hardware, software, and related services to the DoD and NASA. In late 1989, the Army Corps of Engineers awarded CDC a contract with a value of up to $365 million for up to 11 years. CDC will provide an integrated, worldwide network of CYBER computers. Over 50% of the contract revenues will come from systems integration services that the Computer Products division will provide.

t. American Management Systems (AMS)

AMS was founded in 1969, and is headquartered in Arlington, Virginia. AMS currently has 2,700 employees, and in 1989 had $225 million in revenues, compared to $213 million in 1988. However, AMS' services and products revenues with defense agencies declined to 13% of total revenues (from 26%) by the fourth quarter of 1989. This was as a result of cutbacks in defense spending. For the second quarter of 1990, AMS had revenues of $63.3 million. For the first half of 1990, AMS' revenues were $121.5 million.

AMS provides several services, including software development, requirements assessment, project management, network design, training, and maintenance. They provide these services to the following markets: banking and finance, telecommunications, education, retail, government,

© 1990 by INPUT. Reproduction Prohibited.

health care, utilities, insurance, wholesale/distribution, manufacturing, and energy.

In late 1989, IBM made an $18 million investment in AMS. The investment, which was announced in July 1989, represents approximately 10% interest in AMS. An IBM vice president was also elected to the Board of Directors of AMS. At the same time, AMS began work on the development of application software for IBM.

In March 1990, AMS won a $7.5 million contract for systems development support from the Navy's Submarine Monitoring, Maintenance, and Support Office (SMMSO). AMS will help SMMSO upgrade its computer applications network.

In April 1990, AMS was named as the winner of the Capital Region Emerging Company Award by the Association for Corporate Growth. The Emerging Company Award is given annually to the company in the Baltimore/Washington area that exhibits the most significant combination of strong growth and outstanding potential for future success. The key factor in AMS' selection was its achievement in applying the power of computer technology as an integral part of business strategy.

In August 1990, AMS announced that it acquired a 10% equity interest in Advantage KBS, Inc. (AKBS). AKBS is a consulting company specializing in knowledge-based systems. The two firms will jointly market expert systems consulting and systems integration services to major insurance companies.

3. Other Professional Services Vendors

This market is dominated by professional services and computer hardware firms. These vendors make available a broad range of skills to meet planning, development, integration, and implementation requirements.

Professional services vendors offer services that can include the acquisition, assembly, and integration of hardware, communications, and software. The presence of some of the better-known hardware vendors as leaders in the federal professional services market is derived from their increasing thrust into alternative areas of the information systems and services marketplace. Smart vendors have been broadening their revenue streams in the face of a tightening market. Also included in this market are firms that have been spun off from parent organizations not in the information services (e.g., Boeing Computer Services, Martin Marietta, and Grumman Data Systems).

Although they have not been included in the top twenty vendor list, the Big Six accounting firms are a force in the market. These companies

© 1990 by INPUT. Reproduction Prohibited.

include Andersen Consulting, KPMG Peat Marwick, Coopers & Lybrand, Deloitte & Touche, Price Waterhouse, and Ernst & Young.

Not-for-profit organizations also compete with private industry for professional services work from the federal government. Leaders in this area include corporations such as Mitre, Batelle Memorial Institute, the University of California, and Carnegie-Mellon. Aerospace Corporation provides professional services primarily to the Air Force.

Finally, some government data centers with unique skills and/or available capacity also compete with private industry for government contracts. Government agencies have the choice of contracting outside or using available government centers, including capabilities of other agencies. In many cases the cost may be the same, but by staying in-house, the agency saves the time and effort required to put a contract into place competitively.

D

Market Size by Agency

The information presented in Exhibit III-3 provides GFY 1990 and GFY 1991 budget data extracted from the Office of Management and Budget Circular A-11 agency reports. Exhibit III-3 does not cover the entire federal government, but does include many of those agencies surveyed by INPUT.

The GSA continues to lead in the amounts spent for consulting, education, and training. This results from growing popularity of both the zonal Basic Ordering Agreements (BOAs), as well as the BOAs from FEDSIM and the Software Management Center. The Department of Energy has greatly increased its budget in this area. This is most likely due to their heavy use of systems engineering and technical assistance contractors.

In software development, NASA is now the largest user of outside services. This reflects NASA's challenging agenda of manned space flights, probe launchings, and the space station program. GSA is also a heavy user of outside software development because of the BOA contracts. The Defense agencies and Energy continue to use an abundance of software development services.

All three military services make heavy use of systems operations services, as do Energy and NASA, which have a tradition of using contractors for facilities management.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT III-3

Federal Government Agency Professional Services Budgets, GFY 1990-1991

$ Millions						Agency
Consulting, Education, and Training		Software Development		Operations and Maintenance		
1990E	1991F	1990E	1991F	1990E	1991F	
15	14	58	52	77	78	Agriculture
7	8	57	79	63	64	Commerce
1	2	5	6	32	42	Education
75	80	301	320	255	283	Energy
347	239	334	404	66	71	GSA
13	19	51	61	93	97	HHS
1	<1	28	56	19	21	HUD
14	11	29	44	46	49	Interior
33	35	24	22	20	24	Justice
<1	1	16	16	38	40	Labor
53	51	440	510	421	475	NASA
3	3	35	34	34	38	State
7	7	57	64	81	104	Transportation
6	9	64	90	182	202	Treasury
12	16	12	26	40	49	VA
14	7	424	392	414	442	Air Force
47	40	429	461	108	114	Navy
47	48	259	323	571	628	Army
18	18	22	24	30	39	DLA

E = estimated
F = forecast

© 1990 by INPUT. Reproduction Prohibited.

Unlike in past years, civil agencies are now showing more potential for growth than defense agencies. This potential reflects the effect of budget constraints on defense agencies, as well as the maturation and, in some cases, winding down of major defense programs. However, since civil programs tend to be less formalized and homogeneous than defense agencies, successful vendors will need to invest more in both marketing and sales efforts.

E

Federal Market Issues

Information technology promises to provide higher quality government services at reduced cost to the public. However, the use of this technology is dependent upon the leadership of Information Resources Management officials. These leaders need to define and implement a clear but flexible architecture that includes the agency's concept of how it will do business in the future. To discipline the agencies, the Office of Management and Budget now requires them to produce long-range Information Resources Management plans. These plans describe the agency's current computing environment and programs and goals for the expanded use of information technology to meet the agency's future needs. The plan also describes how the agency will achieve those goals.

1. The Grand Design Approach

An issue that federal information technology managers face is their approach to upgrading their systems. In the recent past, agencies often purchased equipment and services without a clear plan for how they would fit into the agency's overall strategy. This resulted in acquisitions of inappropriate or duplicate systems, and systems that could not be integrated with other agency systems.

Some agencies have responded to this by acquiring a large integrated system of hardware and software. An integrated system eliminates problems of connectivity and in most cases addresses all of an agency's information technology needs. But a grand design approach to developing a computer system fosters several problems. During the planning phase of the procurement, coordination problems often arise, and the project may take so long to plan and procure that it can be burdened by staffing problems throughout the life of the project.

The procurement can also be confounded by inexperienced project managers and contracting officials whose lack of acquisition skills could delay the project. A grand design project can also be sidetracked by uncertain funding during the planning phase. The project could be so large and take so long to implement that funding could be threatened by political opponents.

The grand design is opposed by some people in the GSA and in the GAO. Although they favor the modular approach to building systems, grand

© 1990 by INPUT. Reproduction Prohibited.

design and modular projects must in the end be tied together into integrated systems. Many of the criticisms of the grand design approach can also be applied to the modular approach. The real difference between the two approaches appears to be the contract vehicle. Industry and government are still commenting on whether the modular approach will work efficiently and what, if any, effect project downsizing will have on systems integration.

Recently, Richard Austin, the Administrator of the General Services Administration, said that federal systems integration contracts are within the law. This statement was a complete turnaround from previous GSA policy. Last year, Frank McDonough, assistant commissioner for GSA's IRMS, said that he suspected that federal systems integration contracts violated the Walsh-Healey Act of 1936.

Congress passed Walsh-Healey to protect the government from middlemen who acted as brokers of goods and services. The brokers made a profit but provided nothing of value to the government. But systems integrators often provide crucial value-added services through their involvement in installing a system for the government. Under the law, the vendor must either manufacture the product he sells or must maintain an inventory of the product. But systems integrators usually do neither, which was the original cause of the problem. At this writing, Congress is still considering the issue and the Labor Department has not yet issued new regulations. Further, the departure of Elizabeth Dole as Labor Secretary may further delay any decision.

2. The Competition In Contracting Act (CICA)

The Competition in Contracting Act (CICA) of 1985 provided expanded legal powers for ADP protest action through the GSA Board of Contract Appeals (GSBCA) and GAO, increased the opportunity to employ negotiated contracts, and established seven more-restrictive categories of exceptions that permit sole-source awards, as shown in Exhibit III-4.

EXHIBIT III-4

Intent of the Competition In Contracting Act

- Provide for equitable resolution of protests through expanded GSBCA and GAO legal powers
- Foster more competitive opportunities
- Clarify sole-source award categories

© 1990 by INPUT. Reproduction Prohibited.

The CICA has not achieved what was expected, as is well known in the vendor community. Today, virtually all major procurements are protested. Some agencies and winning vendors are providing payments to protesters in order to secure withdrawal of the protest. This is known as fedmail. The increased protest actions occur in procurements of all types, including professional services.

Based on analyses of protest decisions, it is apparent that evaluation procedures represent the biggest source of protest actions. If agencies lock themselves into an overly restrictive evaluation model, any deviation usually results in a sustained protest. GSA has recommended more flexible evaluation models, giving the selection committee more latitude in comparing the cost and technical bid specifications. This complicates the bidding on professional services contracts, since the trade-offs between price and offerings are not always clear.

The General Accounting Office recently offered information resources management officials insurance for delicate ADP acquisitions by setting up a "straw man" acquisition model that agencies can use to compare with their ongoing procurements. Agencies have often complained that they have followed what they perceived to be the rules of procurement and still found themselves the subject of GAO audit reports. The GAO model is divided into several phases: presolicitation, solicitation, award, and postaward.

3. Budget Constraints

Future-year funding of current acquisition programs and approval of funding for the next budget year are now in danger of being cut. The authorization of an agency budget and the requested information sources by the agency oversight committee do not assure the agency or vendors that funds will be provided in the out-years. Appropriation acts for agencies approve the TOA (Total Obligational Authority) for certain large systems, but not the fiscal year or years in which the funds (called outlays) will be available.

At this writing, the GFY 1991 budget has not been approved. Congress is working slowly to write a budget package that is acceptable to most groups. The President is holding a hard line and will veto any budget package that does not meet his conditions. Bush has wavered on tax rates and capital gains cuts, and Congress has fallen to pressure from special-interest groups to remove some of the cuts it had already approved. Congress must work to pass a budget reconciliation bill, or the federal government will shut down again.

The effect of the budget crisis on professional services programs will be to reduce the amount of overall funding available for them and to slow the amount of spending on outside services. The government will move

© 1990 by INPUT. Reproduction Prohibited.

to protect itself, like a turtle withdrawing into its shell. The government will continue to contract for those services which it has in the past, but new projects and initiatives will be cancelled or postponed.

4. POSIX

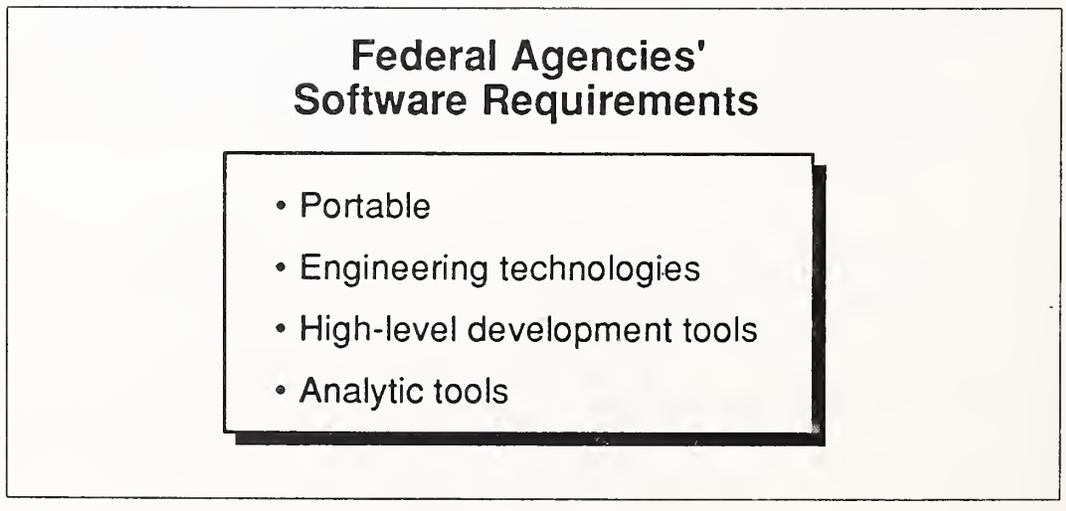
Portability of software, which protects past investment in application development independent of the hardware platform it may run on, is in high demand. Agency respondents in previous studies noted a growing need for portable software that is readily adaptable to a changing hardware environment. Professional services firms should accommodate this condition by providing the procedures and techniques to foster software integration.

Some agencies believe that UNIX-based products provide a partial solution to the problem of interoperability of software across different vendors' hardware. However, among vendors, differences persist on various implementations of the POSIX standard, and these differences will retard the interoperability requirements of agency executives.

Most agencies now emphasize the need for information sharing. POSIX will facilitate trading of information within an agency by allowing applications developed in different facilities to be used throughout the agency. Agencies are increasingly required to merge large applications into a single, transparent software system that fits their end users' needs, rather than government end users adapting their needs to the capabilities of agency software.

Exhibit III-5 lists software requirements of federal agencies.

EXHIBIT III-5



© 1990 by INPUT. Reproduction Prohibited.

To modernize software and effect productivity improvement, agency ADP organizations are seeking greater use of:

- Software engineering technologies, including more efficient software management methods, software development methodologies, and data dictionaries

- Higher-level development tools, including program generators and fourth-generation languages

- Better analytic tools for all sizes of machines—microcomputers, mid-size computers, and mainframes—that will provide programmers with development aids such as automatic documentation, cross-referencing, etc. Agencies also require improved system software for super-computers, and this represents a growing market.

5. GOSIP

Most federal agencies appear ready to implement systems under GOSIP—the Government Open Systems Interconnect Profile. GOSIP is a subset of the International Open Systems Interconnect Communication standards. GOSIP will support interoperability and data exchange among different federal computer systems and communications networks. As of 1990, GOSIP is a requirement for new systems and services. Agencies will use GOSIP to integrate their multivendor networks and systems.

With the DoD, vendors face a potential dilemma. On one hand, DoD has specified GOSIP as a mandatory standard beginning in 1990. However, several DoD agencies are showing reluctance to abandon the Transmission Control Protocol/Internet Protocol (TCP/IP) standard.

Therefore, over the next few years DoD will procure systems with both GOSIP and TCP/IP. Further, it is certainly possible that even after 1990 TCP/IP will still be used. Vendors, therefore, must show a willingness to adapt to changing government requirements. Requirement for the dual standard is evidenced by a recent Air Force contract to provide network interfaces that support both GOSIP and TCP/IP standards. The Air Force, unable to determine which standard to follow, decided that only a dual-standard approach would provide suitable connectivity.

6. Computer Security

Computer security for the federal government focuses on protecting the integrity of federal information systems. The concept of integrity in government information entails the confidentiality of data to which access should be limited, such as personal, proprietary, and national security classified data. It also includes assuring the accuracy and accessibility of information so that the public can be informed and agencies

© 1990 by INPUT. Reproduction Prohibited.

can discharge their duties efficiently and responsively.

The federal government will spend ample sums on professional services support to help meet its computer security needs. First, the Computer Security Act requires training of appropriate personnel. Although the Office of Personnel Management (OPM) has become very active in this area, various private groups are also providing computer security training to federal personnel. Continuing consulting support will be needed for security evaluations and audits, as well as for upgrading computer security measures. However, if the agencies are not required to submit updated security plans, the volume of planning opportunities will likely disappear. Custom software development will also play an important role in the computer security market. This market is covered in another Federal Information Systems Program report, *The Federal Computer Security Market, 1990-1995*.

7. Ada

The federal Ada market is now becoming a major force, despite its slow start. The Ada-related software development market is growing slightly faster than the overall federal software development market. INPUT has forecasted the Ada software development market to grow from $66 million in 1989 to $104 million in 1994, a CAGR of 10%. This strong growth is because most Ada projects require new, custom solutions.

The House Appropriations Committee recently approved a 1991 DoD budget package that would require all software to be written in Ada. The bill proposes that after June 1991, all new software be in Ada unless the defense secretary issues a waiver. The bill added $10 million in Ada research and development.

It has been reported that most Ada software engineers and program managers believed that Ada increased their productivity. However, in a recent report, GAO complained that DoD had not designed projects to assess the long-term cost savings and other benefits of Ada. This may account, in part, for Ada's slow progress because budget constraints may inhibit program managers from experimenting with Ada.

In some respects, many Ada products are now tied in with CASE products. Many vendors now offer product packages that include modules from both disciplines. Thus, vendors can offer more comprehensive solutions to agency problems. However, some agencies have been slow to take advantage of these packages because of cuts in training budgets.

It has been proposed that Ada should be made POSIX-compliant in order to put the language in the mainstream and ensure its survival. Current versions of Ada do not communicate effectively with the rest of the

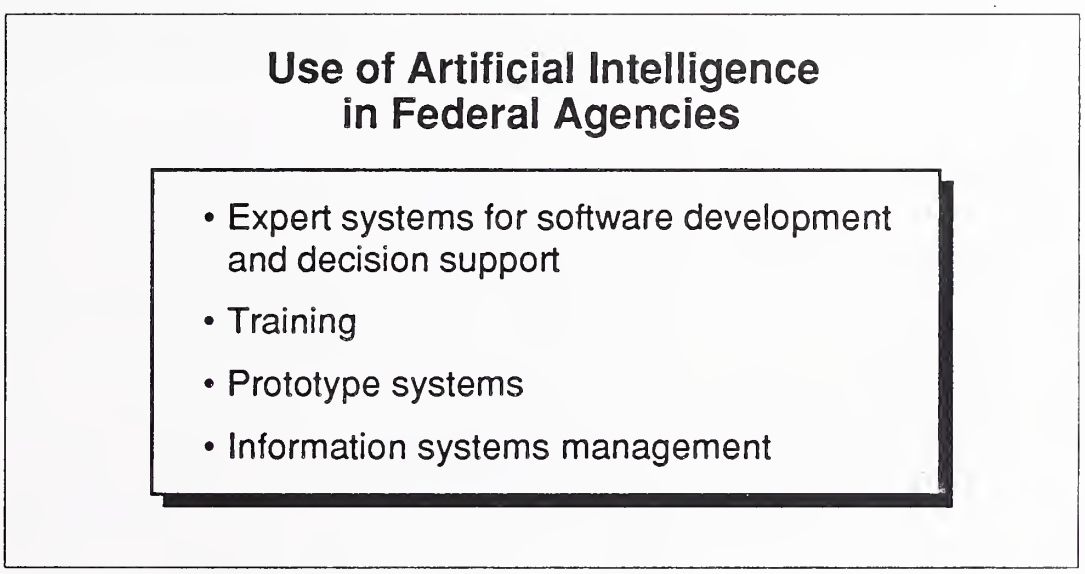
© 1990 by INPUT. Reproduction Prohibited.

programming world, and it lacks a standard execution environment. POSIX could provide this environment.

8. Artificial Intelligence

Vendors are focusing on introduction of new artificial intelligence technology to the government, primarily in the areas of software development and decision support. Currently, expert systems (which are a popular subset of the family of AI capabilities) are being developed as standalone end-user production systems to automate knowledge-based processing. In meeting federal professional services needs, vendors must often include AI features as part of their offerings. Exhibit III-6 lists the uses of AI in federal agencies.

EXHIBIT III-6



The DoD is taking the lead in developing artificial intelligence programs. AI is providing useful training for analysts, and applications are being employed in tactical situations and support functions. Civil agencies are also developing and operating expert systems for large-scale information processing.

As in other software areas, the government is looking to industry for solutions, not just products. Therefore, in response to this trend, AI vendors will migrate beyond standalone systems to new products that integrate approaches and solutions. Current federal prototyping efforts are demonstrating AI feasibility in information storage and retrieval, data communication, and other typical management functions. Areas in which federal workers must interview the public seem especially promising for AI.

© 1990 by INPUT. Reproduction Prohibited.

9. Procurement Integrity Act

The Procurement Integrity Act, originally passed by Congress in 1988, is scheduled to go back into effect December 1, 1990. The House and the Senate are split about whether to let the Integrity Act go into effect, or to extend the suspension another six months in order to consider a new ethics bill recently proposed by the Bush Administration. John Conyers, chairman of the House Government Operations Committee, is in favor of letting the integrity act go into effect later this year, as is Jack Brooks, the former committee chairman. However, the move to postpone the law for further consideration of alternative measures has strong support in other parts of the House. Given the current inability of Congress to make a decision, they will probably extend the suspension.

Conyers replaced Jack Brooks as committee chairman in 1989. To date, Conyers has been less involved than Brooks in the federal procurement process. However, Conyers has shown interest in probing alleged bias toward IBM in the federal procurement process. In April 1990, Conyers requested a report by the Department of Defense Inspector General on possible violations by Unisys of the Buy American Act. The investigation is focusing on the Desktop III contract to determine if Unisys was unfairly favored in areas such as Buy American violations, bundling of the math coprocessor with the central processor unit, and the delay of a functional test demonstration from pre-award to post-award.

Conyers' committee is also investigating the Treasury Department DMAC II contract for the possibility of fraud. Conyers is trying to determine whether the Treasury procurement system is extremely poor or simply fraudulent. Conyers appears to be interested in issues surrounding large information systems procurements. Brooks, although he is no longer the chairman of the House Government Operations Committee, is still interested in federal information systems procurements. Brooks is now the chairman of the House Judiciary Committee. Brooks wants the funding of the Justice Department Project Eagle frozen at $12 million while his committee investigators continue probing the contract for the underlying causes of problems within the procurement process.

10. Trail Boss

The Trail Boss program initiated by GSA appears to be successful. Many federal managers have received their training and are now leading federal information systems acquisition projects. The GSA now wants to establish second and third Trail Boss programs. One would train 1,000 managers by the year 2000. The third Trail Boss program will prepare senior IRM managers for all facets of installing and maintaining major systems.

© 1990 by INPUT. Reproduction Prohibited.

11. MASCs

At this writing, much confusion exists about GSA policies for Multiple Award Schedule Contracts (MASCs), especially as they relate to

- Delegation requirements
- Synopsis requirements
- Maximum Order Limitations (MOLs)

INPUT obtained a copy of the GSA document entitled *Final Report of Government-Wide Task Group on Multiple Award Schedule Contracts*, dated August 1988. This document is available for client review in the INPUT library. The report recommends an increase in the synopsis threshold from $50,000 to $250,000. However, it does not appear that GSA will implement this recommendation, at least not in the near future. The report also recommends raising both the Maximum Order Limit (MOL) and the DPA threshold to $600,000.

The report is a bit ambiguous, but increasing the thresholds seems to be its aim. However, at this writing, it appears that the DPA threshold will be raised to $300,000, matching the current MOL. INPUT recommends that clients use the hotline service to get updates on the status on these issues when needed.

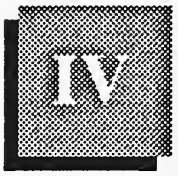
Recently, GSA announced that by mid-1991 it would require delegations of procurement authority (DPAs) for professional services contracts meeting certain criteria and thresholds. This reflects GSA's (belated) recognition of the importance of these contracts in federal IRM. It remains to be seen what, if any, effect this change will have on the federal professional services market.

12. Mergers and Acquisitions

The merger and acquisition trends in the federal marketplace seem to be subsiding. Because the federal professional services market is growing at a slower pace, professional services firms lose their attractiveness and lose their value. Black and Decker could not find a buyer for PRC and Advanced Technology, Inc., so the two firms are being merged. The new firm will be called PRC Inc. but will be headed by Scott Thompson, the former ATI chief. BDM was recently acquired by the Carlyle Group and may have found a permanent home. The Carlyle Group has Frank Carlucci as a top officer, and Carlucci has indicated his interest in keeping BDM.

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Federal User Requirements and Trends

A

Significant Problems/Issues

Federal information system (IS) modernization directives, in combination with automation demands and technology advances, are contributing heavily to the federal government's continuous need to improve the quality and quantity of ADP services. This is occurring within the confines of budget deficit reduction measures. At the same time, modernization directives are overcoming the handicap of a rapidly aging ADP inventory and escalating software costs. More requirements contracts and greater use of functional specifications are facilitating this transition to new and better systems.

1. Budget and Personnel Constraints

Most federal agencies do not have the necessary staff to support the quality or quantity of IS-supported services demanded by the Congress and by the American public. Agency respondents noted that the current federal personnel policies have kept government agencies from hiring and retaining enough qualified IS staff. Hiring ceilings and low salaries were cited as the main reasons leading to the increased attrition rate in the government and the growing use of contractors for professional services. In most metropolitan areas the problem becomes even more acute.

The federal government cannot compete with the private sector in recruiting because the financial rewards offered by the private sector are better. Furthermore, government personnel policies contain outdated standards and job descriptions and impose severe administrative problems.

Some resolutions to these problems are being developed. Currently, agencies are working with the Office of Personnel Management to upgrade procurement professionals and give greater support for contracting personnel. The Trail Boss program has also been initiated; this program is improving the training of contract administrators and senior project managers.

© 1990 by INPUT. Reproduction Prohibited.

In keeping with administration policies relating to OMB Circular A-76, most commercial-type (as defined by OMB) activities are subject to being contracted out. This includes most activities supporting information systems, with the exceptions of planning, budgeting, and overall program responsibility.

For the past several years, budget cuts have somewhat limited the growth of the professional services market. However, as indicated in the previous chapter, the federal professional services market will continue to show significant growth, which is further shifting the balance between in-house and contracted professional services activities.

2. IS Equipment Inventory Upgrade

Upgrading the existing inventory of IS will initially result in reduced software maintenance costs. However, this upgrade will not significantly impact overall software expenditures for several years.

- The impact of the IS equipment purchase versus lease directives will likely remain mixed for some time. The additional funding that would be directed toward purchase of equipment might slow the upgrading process to new, more modern equipment. It might also increase the amount of maintenance required to keep obsolete equipment (and the software designed to run on that equipment) operational until it is replaced. That portion of maintenance included in FM contracts comprises part of INPUT's professional services delivery mode. However, as discussed in Chapter III, other forces are expected to increase the number of professional services opportunities.

- The GAO has estimated that 70% of life cycle software costs are related to maintenance. As more custom software and complex systems are developed by or for the government, more maintenance labor will be required to keep that software functional, including interim upgrades to expand the applications of the host computers. This may lead to growth in on-site support services among professional services firms. INPUT includes software maintenance in the software development category of professional services.

3. Personal Computers

The rapidly escalating rate of acquisition of personal computers by government personnel has highlighted major problems of accessibility to the government's numerous data bases and has created opportunities for professional services contractors.

- Re-encoding data designed for large systems can require substantial effort, cause delays in data availability, or lead to inaccurate conclusions.

© 1990 by INPUT. Reproduction Prohibited.

- Implementation of newer technology with more-efficient software imposes an additional technical problem—how to recover information from the tapes of earlier systems, especially when the file codes and procedures are inadequately documented. Numerous professional services firms, often acting through requirements contracts at GSA's Office of Technology Assistance (OTA), have successfully assisted agencies in this effort.

- An increasing number of federal end users require training on hardware and PC-based systems, thus increasing education and training opportunities.

- Security risks escalate with proliferation of sensitive data in PCs that are not adequately protected during user absence. While the impact of these risks may be uncertain at this time, it seems likely that more consulting support will be required to help protect this data.

4. Embedded Computers

Embedded computers are digital computers that are applied in, among other things, real-time military equipment operations to solve tactical, strategic, and operational problems. An embedded computer is capable of accepting information about and providing the results of these problems. As embedded computers become more popular in federal applications, professional services opportunities to support them will become more common.

Although INPUT did not include services provided by professional services contractors to support the embedded computer market in its forecast, there are many opportunities for vendors serving these systems. Contract services are required for consulting, training and education, software development, and systems operations.

5. Software and Related Services

OMB is continuing to pressure agencies to contain costs by maintaining existing software and, when that is not possible, to acquire software packages rather than create new custom software. For example, OMB has mandated that financial software packages be acquired, rather than developed, that conform to an interagency standard. In past years, civil agencies have had the propensity to purchase packaged software. But last year, the Army was the largest buyer, with $96.4 million spent in 1989. The Navy followed with $55 million, and the greatest spending by a civilian agency was $20.8 million by the Department of Agriculture.

Among defense agencies, the Air Force, Navy, and Army all have substantial systems analysis and programming budgets. However, growth in expenditures over the last several years has been slow and will remain so

© 1990 by INPUT. Reproduction Prohibited.

for the forecast period. Slow growth notwithstanding, these agencies represent significant opportunities for custom software development, having planned over $900 million in spending in government fiscal year 1989 alone.

B

Budget and Applications

In earlier surveys, most agency respondents indicated that requirements for professional services would increase. Agencies emphasized the need for new and expanded data services that exceeded current staff capacity and capabilities. Further, as pointed out above, OMB Circular A-76 was having a strong impact, especially in DoD maintenance expenditures.

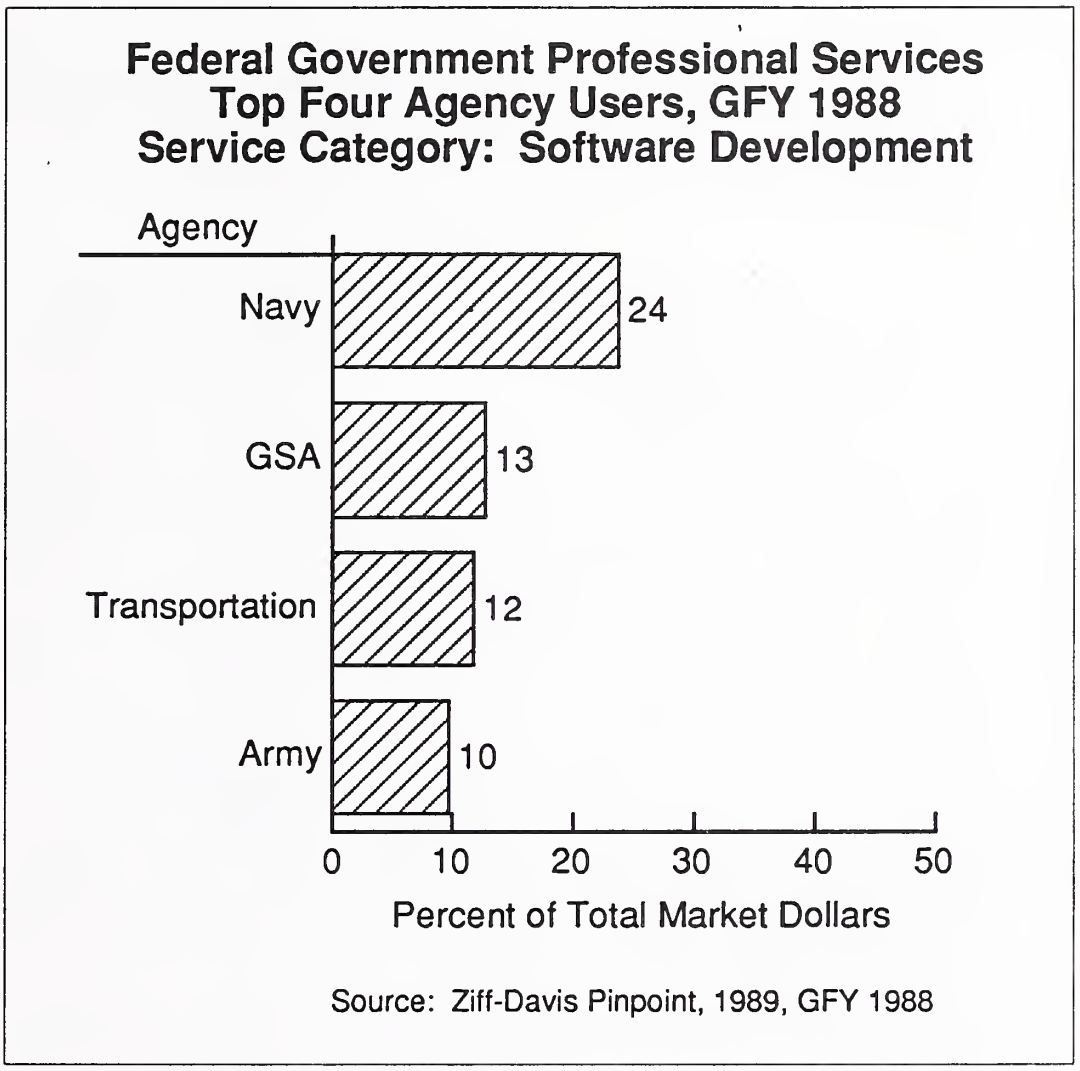
Although use of consulting and education/training services will increase, there is considerable pressure to contain expenditure growth. Education/training (along with travel) may be hardest hit by this pressure. In fact, several agencies expressed a belief that the agency would conduct education/training only as required for new systems and only to the extent that the service is offered by the systems supplier. Thus, education/training would be pulled in-house and occasionally limited to on-the-job experience. However, a countertrend is appearing in microcomputers, whose proper use requires special training.

The largest agency users of professional services by the service categories of software development, consulting services, education and training, and systems operations are shown in Exhibits IV-1 through IV-4. GSA Federal Procurement Data Center data for GFY 1988 was analyzed to determine the percent of market dollars spent by each agency in each service category. Due to some reporting difficulties among the agencies, GSA was unable to develop accurate data for 1989.

Of the market dollars spent by all federal agencies for contractor software development assistance, the Navy has purchased the most (24%). This primarily reflects the Navy's modernization of logistics and supply systems. GSA's high percentage (13%) reflects the high level of Basic Ordering Agreements (BOAs) for zonal (geographic) support and specialized (FEDSIM and Software Management Center) support. Meanwhile, modernization of air traffic control systems accounts for much of Transportation's total (see Exhibit IV-1).

© 1990 by INPUT. Reproduction Prohibited.

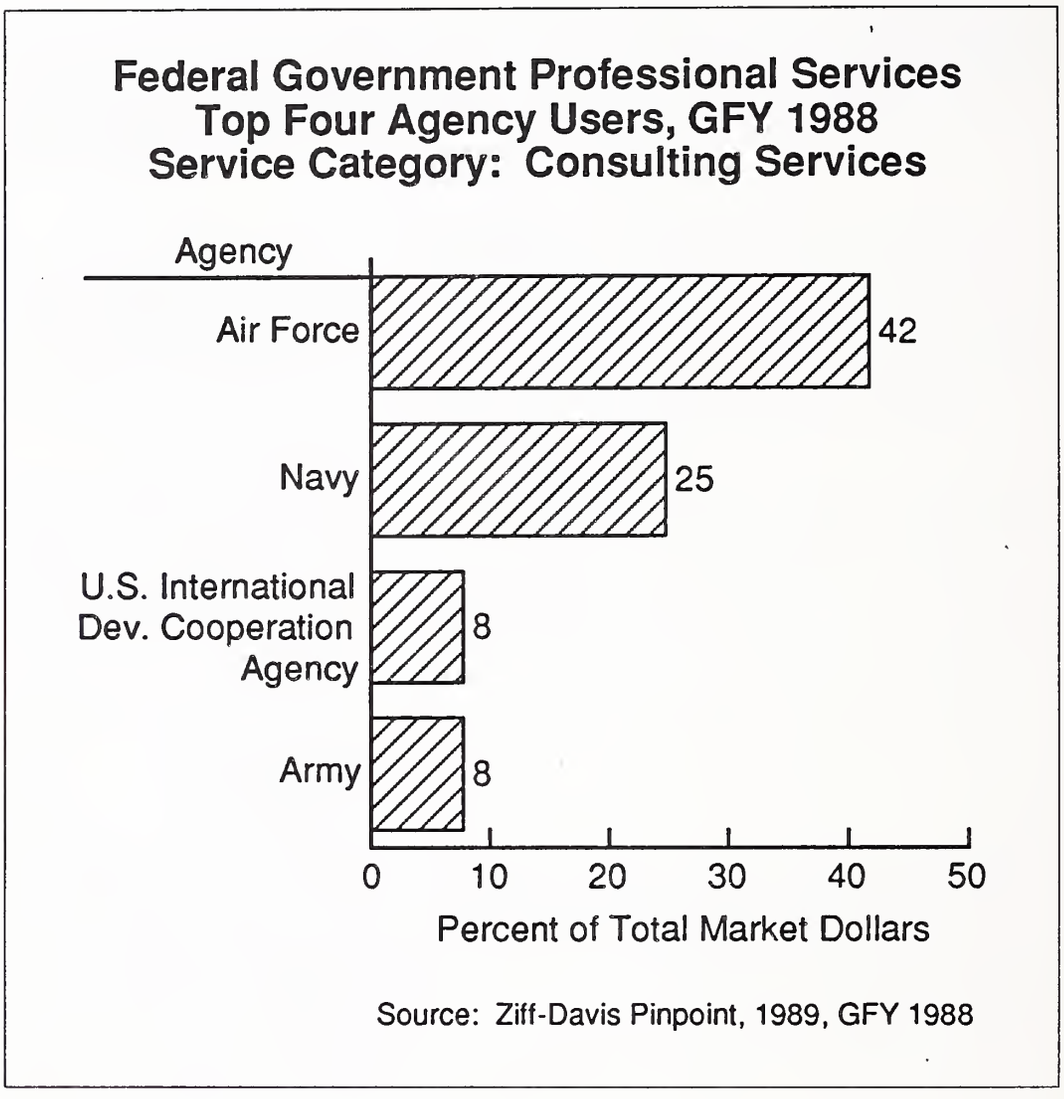
EXHIBIT IV-1



The heaviest users of consulting services during GFY 1988 were the DoD agencies, accounting for 75% of the dollars spent in this category. The largest user was the Air Force (42%), and the little-known U.S. International Development Cooperation Agency was the largest civil user (8%) (see Exhibit IV-2).

© 1990 by INPUT. Reproduction Prohibited.

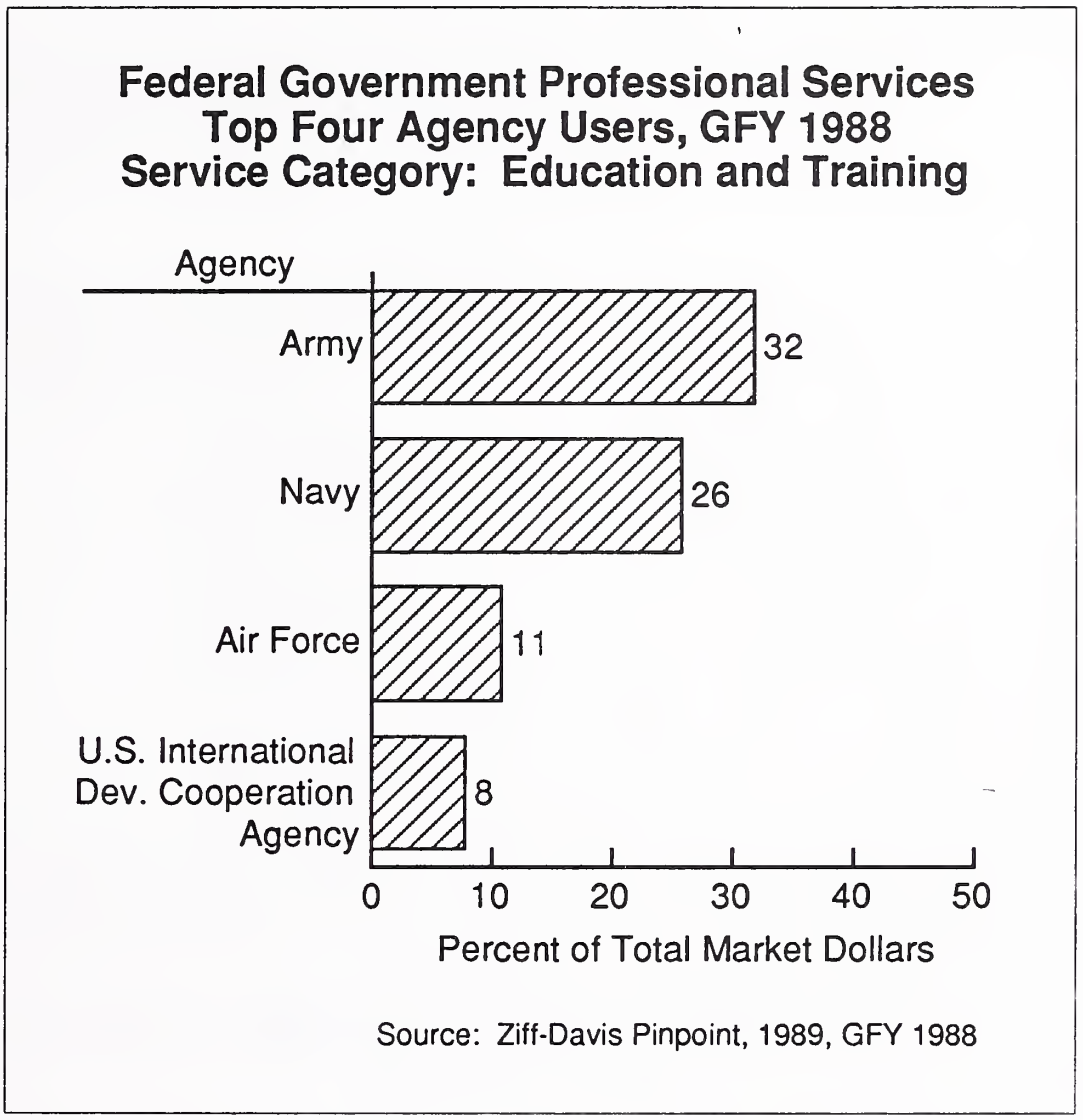
EXHIBIT IV-2



Agency use of education and training services provided by contractors was very similar to that of consulting services. DoD agencies spent close to 70% of the dollars expended on education and training services. Again, the U.S. International Development Cooperation Agency was the largest civilian procurer of services (see Exhibit IV-3).

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-3

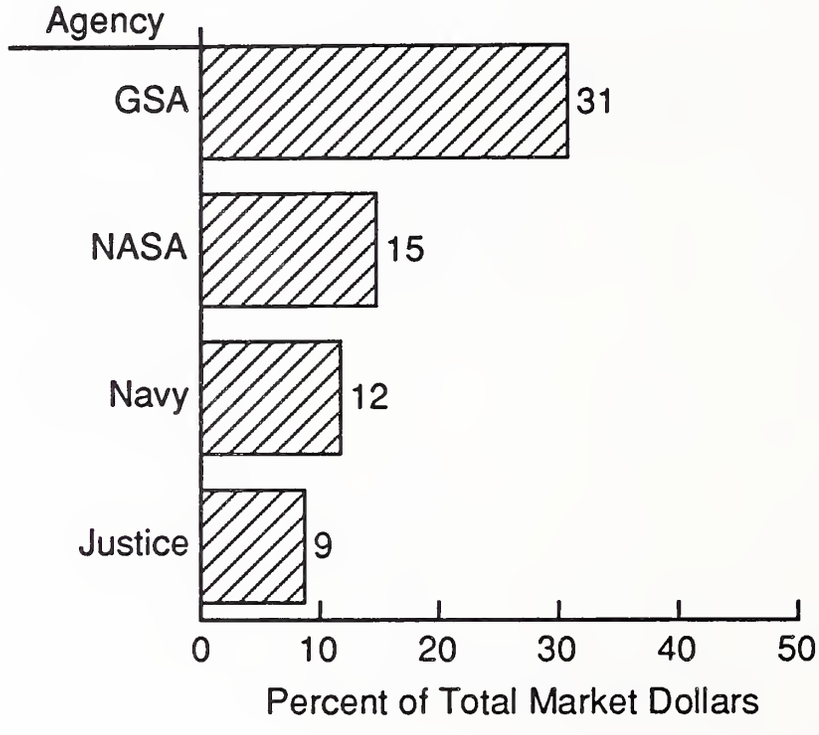


Not surprisingly, GSA and NASA were the largest employers of contractors to operate government-owned data centers. Both agencies are known to rely on high levels of outside technical assistance and expertise to operate their computer systems. Only one DoD agency, the Navy, spent significant dollars on outside contractor assistance to operate its computer operations. New initiatives to bring functions in-house at several Navy agencies may change this in the future. The Department of Justice also spent a considerable amount on systems operations assistance since most of its computer centers are operated by contractor personnel (see Exhibit IV-4).

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-4

Federal Government Professional Services
Top Four Agency Users, GFY 1988
Service Category: Systems Operations



Source: Ziff-Davis Pinpoint, 1989, GFY 1988

Vendors specializing in offering specific types of professional services need to market to those agencies that are the largest users of contractor assistance in those areas. However, continued popularity of A-76 principles may open up more agencies to contractor support.

1. Professional Services Budget Distribution

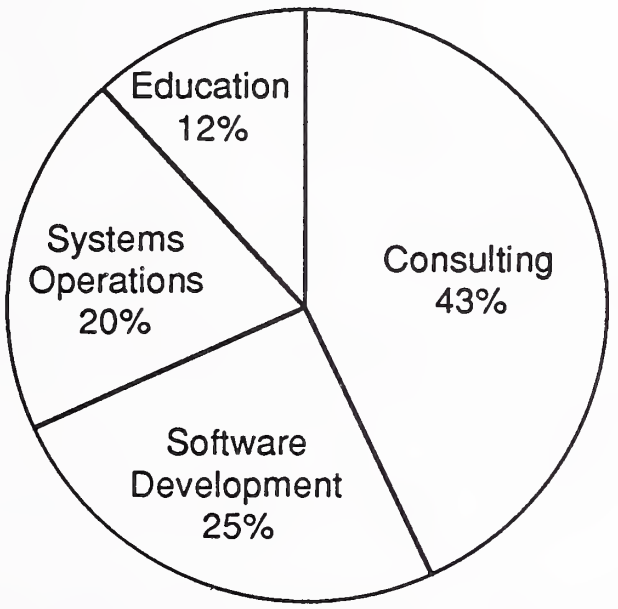
INPUT's analysis revealed that there were significant differences but also some similarities in the distribution of the professional services budgets of the DoD and of the civilian agencies, as shown in Exhibits IV-5 and IV-6.

Consulting expenditures accounted for the highest percentage of the budget for both DoD and civilian agencies. However, the budget for DoD agencies was almost 30% higher than for civilian agencies. This reflects, among other things, the requirement for more studies in DoD to conform to life cycle management directives.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-5

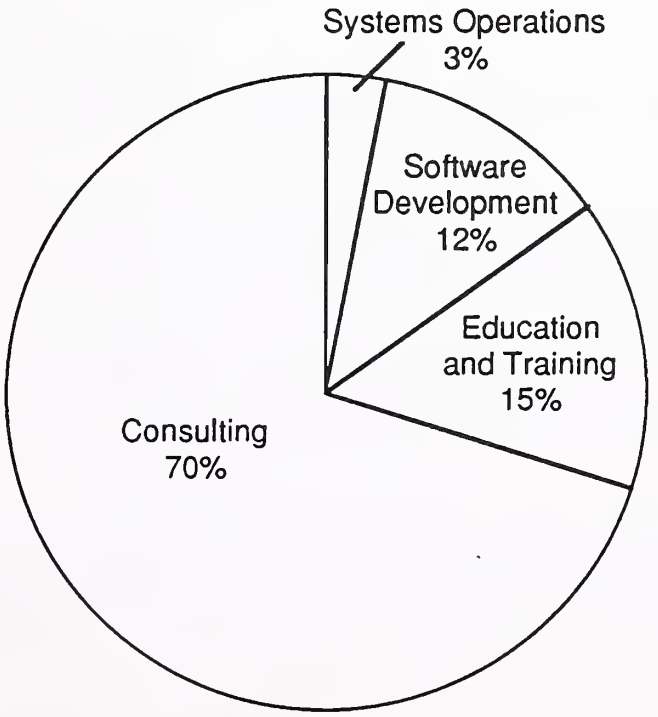
Professional Services Budget Distribution by Service Category Civil Agencies



Source: Ziff-Davis Pinpoint, 1989, GFY 1988

EXHIBIT IV-6

Professional Services Budget Distribution by Service Category Defense Agencies



Source: Ziff-Davis Pinpoint, 1989, GFY 1988

© 1990 by INPUT. Reproduction Prohibited.

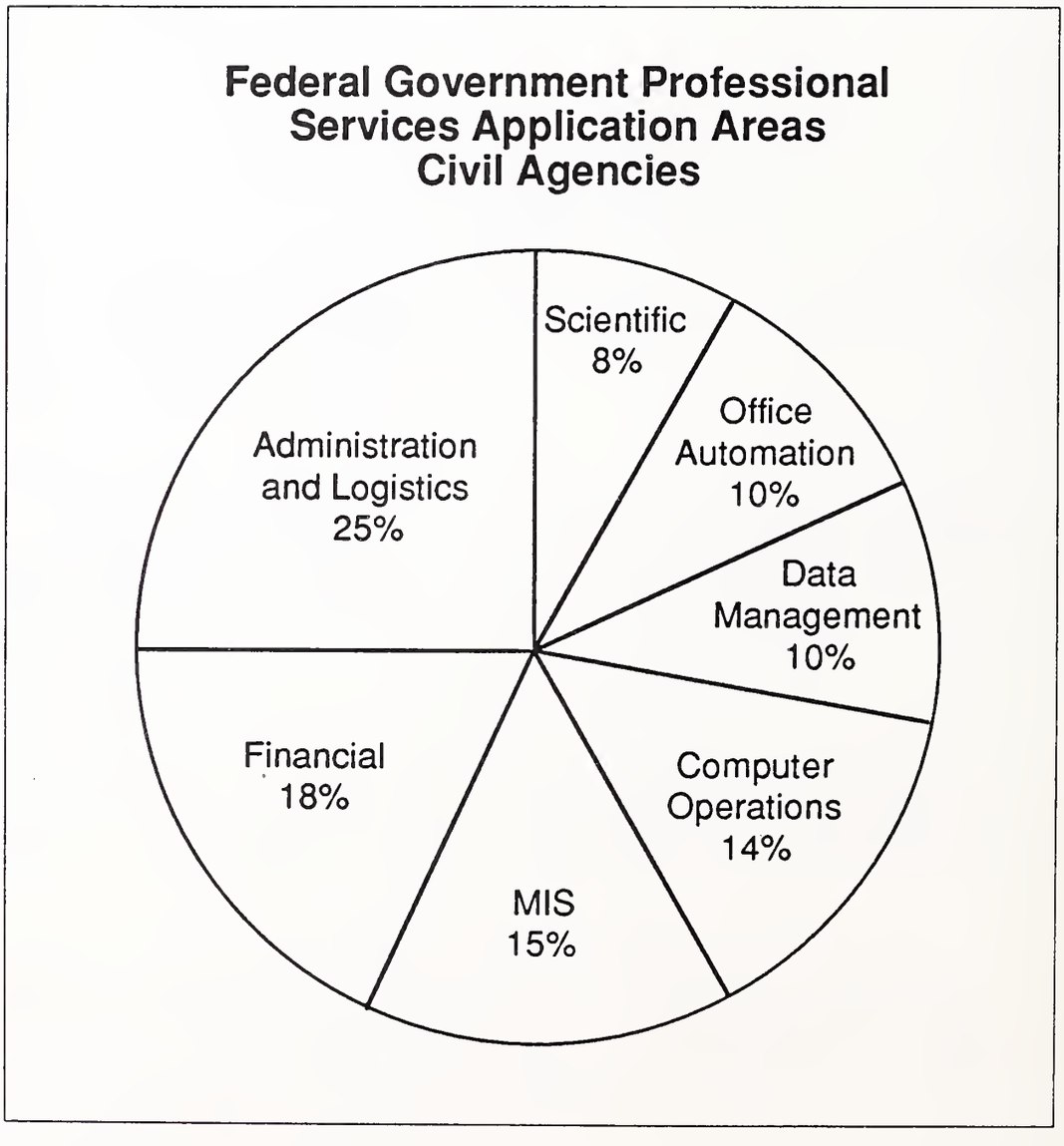
- Budget allotment distributions for education and training were similar for both types of agencies and represent approximately 14% of the professional services budgets.

- Systems operations services in civil agencies reflect the continuing need to cover the larger staffing shortfalls in personnel. Similarly, contracted software development activities represented a larger proportion of the civil agencies' professional services budgets.

2. Application Areas

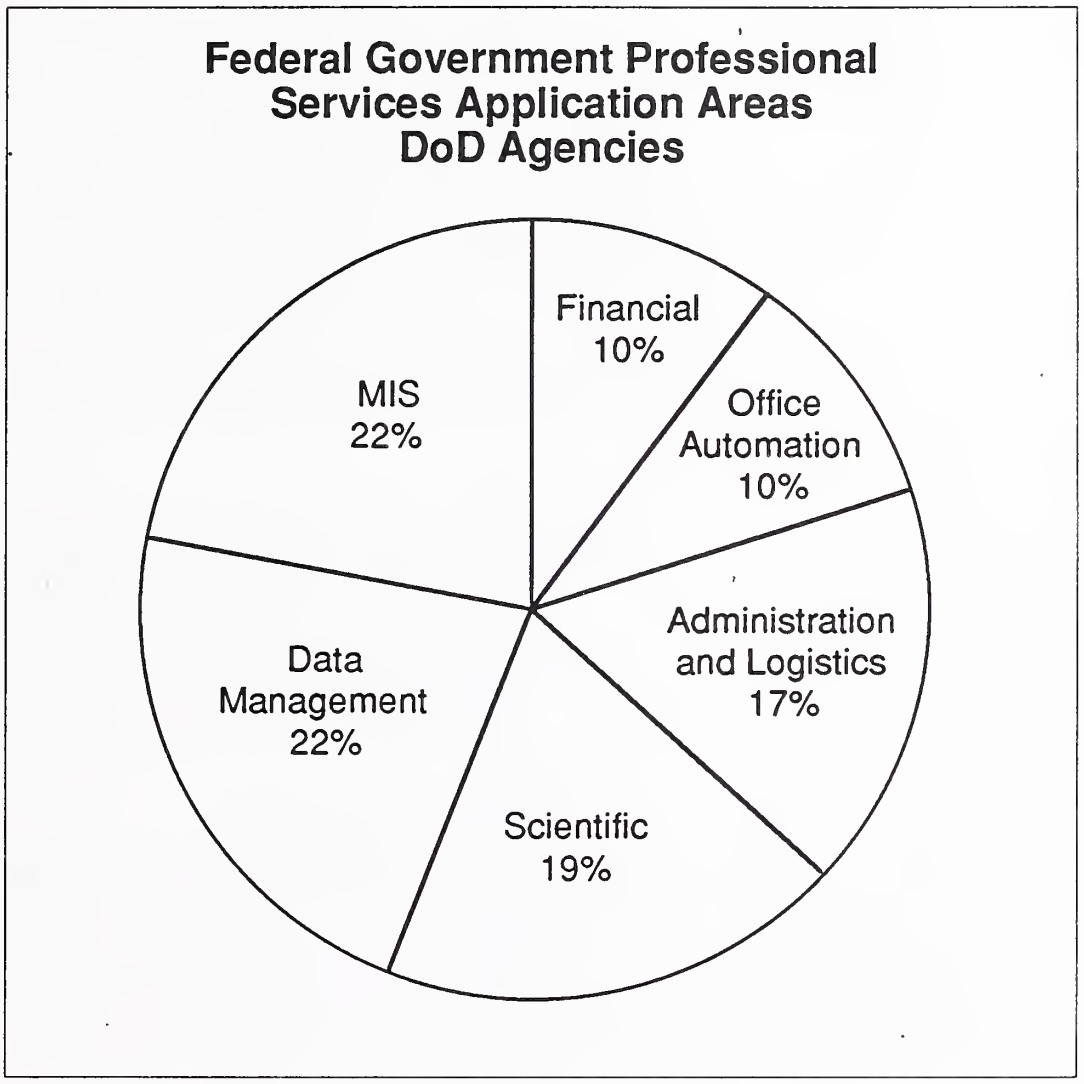
As might be expected, agencies used professional services contracts for a wide range of applications. In an earlier version of this report, INPUT surveyed agencies on their application plans for professional services contracts. Exhibits IV-7 and IV-8 summarize this data for civilian and defense agencies.

EXHIBIT IV-7



© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-8



The data has been normalized somewhat to allow for a comparison of categories. While most of the categories are obvious, some require explanation:

- Administration and logistics includes the housekeeping functions required to operate federal agencies, such as personnel, procurement, and ordering supplies.
- MIS includes support for the IRM organizations in such typical areas as technical consulting, software development, and performance measurement.
- Data management includes the control and dissemination of data to federal agencies, such as provision of data base services and the structuring of data bases in support of specific applications.

© 1990 by INPUT. Reproduction Prohibited.

In both DoD and civil agencies, the predominant applications for which professional services were contracted were those associated with general data processing in support of management/administrative requirements. Financial applications and logistics made up the largest specific applications. Other applications covered a range of information systems and appeared unique to the individual needs of each agency. Other systems mentioned frequently included such tactical directions as LANs, distributed processing, and centralized data bases. While still a less-frequent target, office automation continues to be an application for which agencies buy professional services. Applications tend not be esoteric in nature, but rather "plain vanilla" systems that serve as the backbone of each agency.

While scientific applications made up a relatively small portion of the civilian area, they represented nearly one-fifth of the defense applications. This is somewhat surprising, in view of the scientific emphasis of some civilian agencies, such as Commerce, NASA, and Energy. A follow-up with agency respondents indicated that both Commerce and Energy tended to use more in-house employees for scientific work, leaving only NASA to focus on contractors.

INPUT's subsequent surveys suggested that many agencies have increased their interest in mission-oriented applications that require custom software development. These applications reflect the business of the agencies, such as a tax audit system at IRS, a patient eligibility system at VA, or a polluted site tracking system at EPA. In some cases, agencies had become subject to administrative pressures to use commercial software packages when possible to support these applications. However, due to the specialized nature of so many of these applications, many agencies were still seeking custom software to satisfy their needs.

C

Agency Perceptions of Professional Services

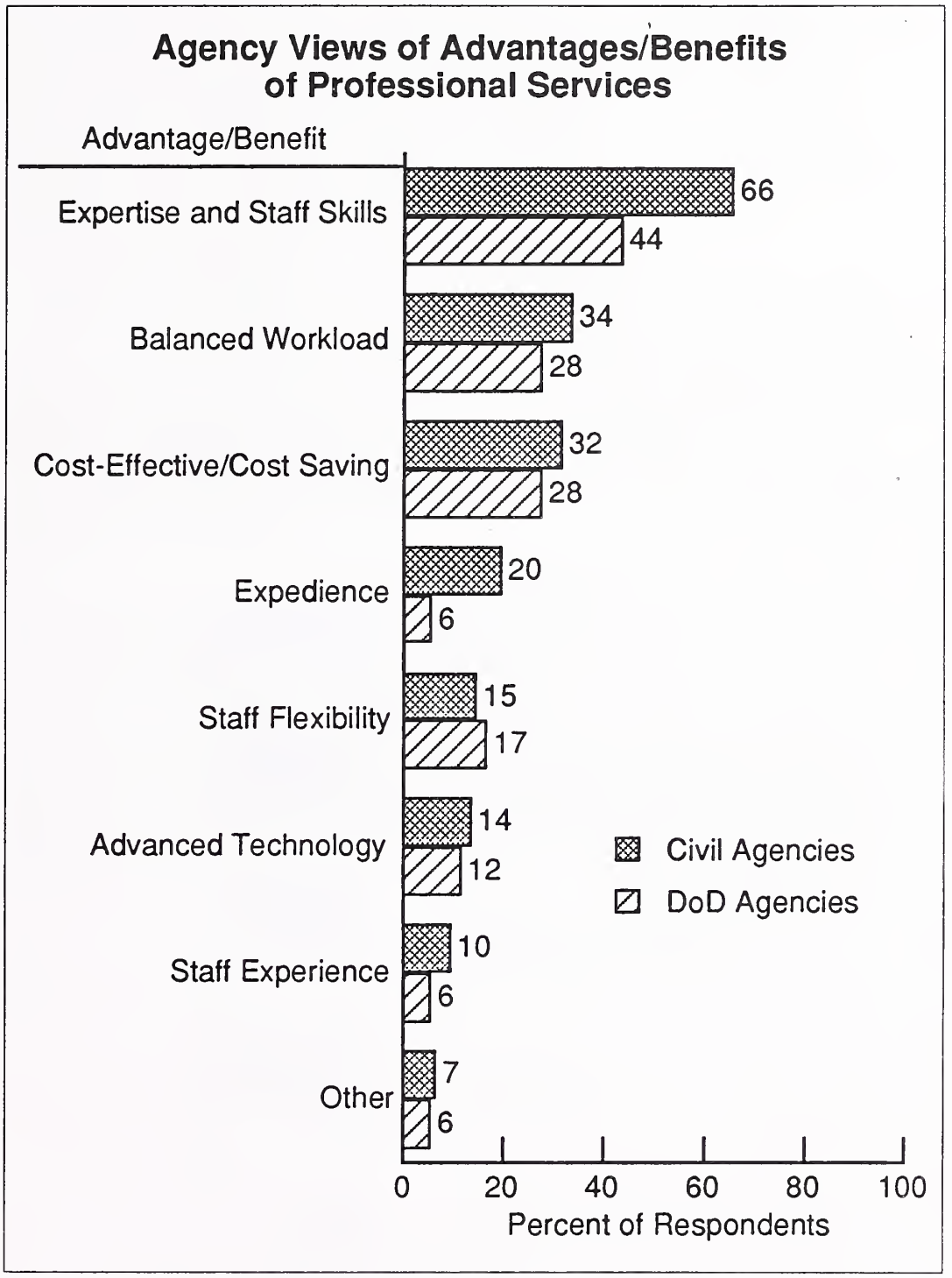
1. Advantages/Benefits of Professional Services

Civil and DoD agencies used professional services contracts primarily because contractors provided experience and expertise that were not available extensively within the agency, as shown in Exhibit IV-9. This data is based primarily on findings from earlier surveys. The totals add to more than 100% due to multiple responses.

Professional services contracts were also used because they give the agency the ability to balance workloads without increasing or decreasing government staff as requirements are added and/or removed. Some government respondents believed that contractor labor is less expensive than government employee labor in performing the same task; in addition, fixed-price contracting enables the government to put a ceiling on the overall cost. This in particular was considered an advantage by DoD respondents.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-9



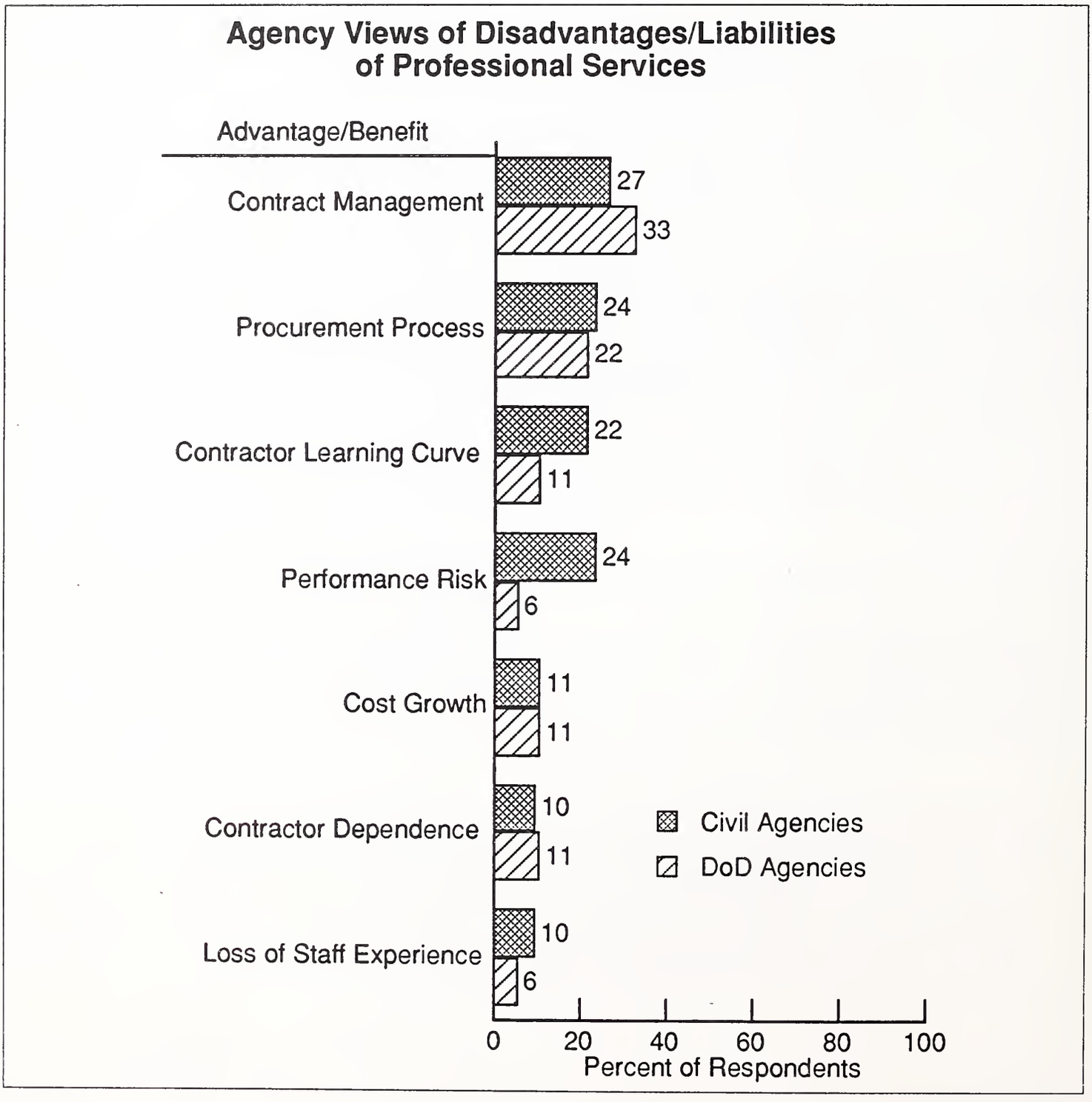
Objectivity, which includes the ability of the contractor to take an unbiased approach to a problem without being affected by internal agency politics, is essential. The civil agencies considered expediency advantageous. Expediency can be measured in terms of accelerated schedules, as well as in terms of fewer problems with government rules, regulations, and policies than if the work were performed in-house.

© 1990 by INPUT. Reproduction Prohibited.

2. Disadvantages/Liabilities of Professional Services

The difficulty in managing contracts for professional services was the primary disadvantage described by both the civil agencies and DoD, as shown in Exhibit IV-10. This factor was by far the major liability according to DoD respondents. Performance risk, or government agencies' concern that the contractor could not deliver or would deliver an unacceptable product, was considered a significant liability by civil agencies. Adherence to schedule was also a factor.

EXHIBIT IV-10



© 1990 by INPUT. Reproduction Prohibited.

The problems associated with procurement, including the long lead time required for contracting and the risk of protest by losing bidders, were considered a disadvantage by the agencies. The learning curve, or the time it takes contractors to "come up to speed" on the problem, was considered a disadvantage by 22% of the civil agencies and by 11% of the DoD respondents. This is especially important on low-priced "body shop" contracts, where turnover runs especially high.

Although, as described in the previous section of this report, the agencies could not accomplish all of their assigned work without contractor support, it is considered by some to be a disadvantage to become dependent on a contractor. The consensus of those who considered this a disadvantage was that contracting for professional services weakened agency ability to do further work because the contractor ended up with most of the expertise in this area of work. This also helps the contractor prolong his services to the client.

D

Case Studies of Professional Services Contracts

In this section, case studies of professional services projects that have either been completed, or are well into the contract life cycle, are presented. The data was provided by prime contractors. The case studies illustrate how contractors attempt to manage complex systems needs by providing consulting services, software development, education and training, and systems operations functions. Summary contract data is also shown (when available) to depict how varying project requirements can affect contract type.

© 1990 by INPUT. Reproduction Prohibited.

FEDERAL PROFESSIONAL SERVICES PROJECT CASE STUDY

Program Name: **Office Automation (OA)**

Department: **Department of Commerce**

Branch: **National Oceanographic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)**

Mission Problem/ Function:

To allow NMFS personnel to use automated systems, to raise productivity, and to assist in the analysis, planning, and implementation of expanded and upgraded systems and facilities.

Major Tasks Performed

- Molded and led the project team
- Performed studies
- Planned, selected, and implemented a LAN of PCs and provided support

Contract Information

Type	Amount	Duration
Fixed Fee	$1.6 million	5 years

Schedule

RFP Release	Bid Due	Award	Completion
UNK	UNK	4/1/85	3/90

© 1989 by INPUT. Reproduction Prohibited.

Contractor(s)

	Company	Function
Prime Contractor	ASG	Office Automation Support
Subcontractor	GTSI	LAN Installation
Outside Consultant	Ted Gaughon	Cable Plant Analysis

Project Components Overview

Professional Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Consulting Services	O
Software Development	P
Systems Operations	P
Education/Training	P

Project Components Detail

Consulting Services
$200,000

	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Systems Management Consulting	P
Services Management Consulting	P
Technical Project Assistance	P
Management Project Assistance	P
Feasibility Analysis	P
Cost-Effectiveness Trade-Off Studies	P

© 1989 by INPUT. Reproduction Prohibited.

Software Development $300,000

Applications Developed/ Modified	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Mainframe Applications	P,O
Network Applications	P
Microcomputer Applications	P,O
Hybrid Applications	P

Software Development Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
User Requirements Definition	P,S
Systems Design	P,S
Contract Programming	P,O
Software Documentation	P

Systems Operation (GOCO) $200,000

Contractor Responsibility	P

Education and Training $100,000

Contractor Responsibility	P,O

Education and Training Services
Vendor instruction of user personnel in operations
Vendor instruction of user personnel in programming
Instructor-led classes and workshops
Personal tutoring services
User group workshops and information sheets

© 1989 by INPUT. Reproduction Prohibited.

Additional Services

	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Communications Planning	P
Equipment and Systems Evaluation	P
Operations Coordination	P
Feasibility Studies	P
Management Studies	P

Original Funding

$900,000

Project Scope

Agency-issued contract amendments to increase the scope of the contract.

Project Status

Completed.

© 1989 by INPUT. Reproduction Prohibited.

FEDERAL PROFESSIONAL SERVICES PROJECT CASE STUDY

Program Name: **ADP Omnibus Support Services Contract**

Department: **Naval Weapons Support Center, Crane**

Branch: **Ordnance Engineering Department**

Mission Problem/ Function:

ADP software development, maintenance, and site implementation services. These services enhance and provide maintenance support for the Ordnance Management System (OMS), the Fleet Optical Scanning Ammunition Marking System (FOSAMS), Non-Nuclear Ammunition Inventory Accuracy (NAIA) Program, and other AIS support services.

Major Tasks Performed

- ADP Studies
- Provided development, design, maintenance, documentation, and training

Contract Information

Type	Amount	Duration
CPFF-LOE	$71 million	8 years

Schedule

RFP Release	Bid Due	Award	Completion
2/17/89	7/24/89	2/21/90	2/20/98

© 1989 by INPUT. Reproduction Prohibited.

Contractor(s)

	Company	Function
Prime Contractor	CACI, Inc.	Project management, design, development, training, site implementation
Subcontractor	CDSI	ADP security, telecommunications
Subcontractor	Concepts (EMC) Engineering	Programming, training, management site implementation

Project Components Overview

Professional Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Consulting Services	P,S
Software Development	P,S
Education/Training	P,S

Project Components Detail

Consulting Services

	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Systems Management	P
Services Management	P
Technical Project Assistance	P,S
Management Project Assistance	P,S
Feasibility Analysis	P,S
Cost-Effectiveness Trade-Off Studies	P,S

© 1989 by INPUT. Reproduction Prohibited.

Software Development $10,000,000

Applications Developed/ Modified	ContractorResponsibility (P=Prime, S=Sub, O=Other)
Unify	P
UNIX	P
BASIC	P,S

Software Development Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
User Requirements Definition	P
Systems Design	P
Contract Programming	P,S
Software Documentation	P,S

Education and Training $8,000,000

Contractor Responsibility	P,S

Education and Training Services
Vendor instruction of user personnel in operations Vendor instruction of user personnel in programming Vendor instruction of user personnel for maintenance

© 1989 by INPUT. Reproduction Prohibited.

Original Funding $25 million

Project Scope Has not changed since contract award.

Project Status Client is currently assessing funding versus the original scope of work. The client is trying to bring support in line with the annual funding ceiling.

© 1989 by INPUT. Reproduction Prohibited.

FEDERAL PROFESSIONAL SERVICES PROJECT CASE STUDY

Program Name: **Transportation Computer Center**

Department: **Department of Transportation**

Branch: **Office of the Secretary**

Mission Problem/ Function:

Support all aspects of Amdahl computer operations, systems programming, and network communications.

Major Tasks Performed

- Improve central site operations
- Improve system reliability
- Increase training availability
- Increase office automation and LAN presence

Contract Information

Type	Amount	Duration
CPAF	$36 million	4 years

Schedule

RFP Release	Bid Due	Award	Completion
12/86	2/87	4/88	9/92

© 1989 by INPUT. Reproduction Prohibited.

Contractor(s)

	Company	Function
Prime Contractor	Unisys	ADP Services Support
Subcontractor	CBSI	Office Automation
Subcontractor	AMI	Amdahl Operations

Project Components Overview

Professional Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Consulting Services	P
Software Development	P
Systems Operations	S
Education/Training	P

Project Components Detail

Consulting Services
$4,000,000

	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Systems Management Consulting	P
Services Management Consulting	P
Technical Project Assistance	P
Management Project Assistance	P
Feasibility Analysis	P
Cost-Effectiveness Trade-Off Studies	P

© 1989 by INPUT. Reproduction Prohibited.

Software Development
$10,000,000

Applications Developed/ Modified	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Financial Systems	P
Invoice System	P
Office Automation Systems	P
Presentation Systems	P

Software Development Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
User Requirements Definition	P
Systems Design	P
Contract Programming	P
Software Documentation	P

Systems Operations
$1,100,000

Contractor Responsibility	S

Contractor Personnel to manage client facilities: 40

Education and Training
$1,500,000

Contractor Responsibility	S

Education and Training Services
Computer-aided instruction
Computer-based education
Vendor instruction of user personnel in operations
Vendor instruction of user personnel in programming
Documentation services

Original Funding $18,000,000

Project Scope The agency modified the statement of work to increase the project scope.

© 1989 by INPUT. Reproduction Prohibited.

FEDERAL PROFESSIONAL SERVICES PROJECT CASE STUDY

Program Name: **Facilities Management**

Department: **Justice**

Branch: **Immigration and Naturalization Service**

Mission Problem/ Function: Generate alien identification cards, maintain records, maintain hardware, and write and maintain software.

Major Tasks Performed

- Provided secure and accurate hardware and software to manufacture ID cards
- Manage facility

Contract Information

Type	Value	Duration
Firm fixed price	$52 million	5 years

Schedule

RFP Release	Bid Due	Award	Completion
3/19/90	5/18/90	10/1/90	9/30/95

© 1989 by INPUT. Reproduction Prohibited.

Contractor(s)

	Company	Function
Prime Contractor	EDS	Facilities management; systems integration
Subcontractor	Thomson	Hardware, hardware maintenance
Subcontractor	Chorus	Software

Project Components Overview

Professional Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Consulting Services	P,O
Software Development	P,S
Systems Operations	P
Education/Training	P,S

Project Components Detail

Consulting Services
$5,000,000

	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Systems Management Consulting	P
Services Management Consulting	P
Technical Project Assistance	P,S
Management Project Assistance	P
Feasibility Analysis	P
Cost-Effectiveness Trade-Off Studies	P

© 1989 by INPUT. Reproduction Prohibited.

Software Development $3,000,000

Applications Developed/ Modified	Contractor Responsibility (P=Prime, S=Sub, O=Other)
Data Base	P
Photo Imaging and Transmission	P,S

Software Development Services	Contractor Responsibility (P=Prime, S=Sub, O=Other)
User Requirements Definition	P
Systems Design	P,S
Contract Programming	P,S
Software Documentation	P,S

Systems Operations $40,000,000

Contractor Responsibility	P,S

Contractor personnel to manage client facilities: 15

Education and Training $2,000,000

Contractor Responsibility	P

Education and Training Services
Vendor instruction of user personnel in operations Vendor instruction of user personnel for maintenance Other documentation services

Original Funding $9,000,000

Project Scope The project scope did not change after the contract was awarded.

© 1989 by INPUT. Reproduction Prohibited.

E

Acquisition Plans and Preferences

1. Characteristics of a Successful Contractor

Agencies surveyed in previous studies showed sharp differences of opinion on successful contractor characteristics (see Exhibit IV-11). In particular, civil agencies ranked staff experience first, while DoD agencies ranked it fifth. Vendor opinions more closely paralleled those of the civil agencies.

EXHIBIT IV-11

Rankings of Characteristics of Successful Contractors

Characteristic	Ranking*		
	Civil Agencies	DoD Agencies	Vendors
Price	2	1	1
Support	4	4	7
Staff experience	1	5	2
Software development experience	3	1	3
Application/functional experience	4	3	6
Federal contract experience	6	7	4
Agency experience	7	5	4

*Ranking: 1 = Most Important, 7 = Least Important

In presenting the choices, INPUT did not attempt to distinguish between vendor price and agency cost. Typically, price represents the quoted charges for performing the work, while cost represents the final payment requirements of the agency. However, for the purposes of this survey, the two terms were combined.

Both the civil agencies and the DoD concur that application/functional experience is an important characteristic, whereas vendors consider it of lesser importance. Differences in ratings for federal contract experience and agency experience exist between the agencies and vendors. Vendors

© 1990 by INPUT. Reproduction Prohibited.

assigned an important rating to both factors, while the agencies themselves gave these factors the lowest ratings for importance.

2. Selection Criteria

Agency ranking of selection criteria tends to change from one survey to the next. However, the proposed technical solution usually remains at the top of the list. Exhibit IV-12 shows that both vendor reputation and staff experience ranked ahead of cost. INPUT's research outside of this survey, however, contradicts this ranking. In particular, most federal evaluation models rank cost second, if not first.

EXHIBIT IV-12

Relative Ranking of Criteria Used in Selecting a Professional Services Vendor

Selection Criteria	Ranking
Proposed technical solution	1
Vendor reputation	2
Staff experience	3
Cost	4
Project management	5

Cost is usually ranked first on low-priced "body-shop" type procurements in which company multipliers in the range of 1.3 to 1.5 are typically bid. This means that, for such areas as contract programmers or computer operators, the vendor bills the government for 1.3 to 1.5 times the employee's salary. Benefits are low and attrition, as might be expected, can be quite high. The government almost always awards these contracts based on lowest cost, and then often regrets the decision later on. Poor vendor performance from low-priced, short-term personnel often costs the government more in the long run.

For high-level consulting jobs and other professional services contracts, particularly those with functional specifications, the proposed technical solution may indeed rank higher than cost. The ranking in Exhibit IV-12 reflects the preferences of the respondent population, mainly agency program managers. Contracting officers rarely participate in surveys, thus preventing their views from being properly represented.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-13

Federal Agency Vendor Type Preference for Professional Services

Vendor/Organizational Type	Percentages	
	Civil Agencies	DoD Agencies
Mainframe manufacturer	16	15
Professional services company	55	69
Not-for-profit	9	8
Software products vendors	20	8
Total	100	100

3. Preference for Type of Vendors

In an earlier survey, INPUT asked both civil and DoD agencies which type of vendor appears more desirable for performing their required professional services, as shown in Exhibit IV-13. Over 50% of the agencies preferred professional services vendors and stated that these vendors are more responsive to meeting a variety of needs and are more knowledgeable in specialized applications.

A larger share of the civil agencies (larger than the share among DoD agencies) preferred software products vendors. Civil agencies' main reason for selection of this type of organization was the software vendor's experience and suitability for certain types of professional service projects.

Presumably, agencies did not believe that all service vendors are capable in all areas. Rather, they viewed vendors according to the vendor's own focus and preferred to match that focus to the requirements of the project. Manufacturers come to the fore when the professional services requirements are closely tied to a hardware system, professional services vendors lead when a total solution is required, and software products vendors have the edge when the services are tied to a software package. Vendors face a Catch-22 when a niche product is required, but the niche product may preclude the vendor from participating in other markets. Often, a hardware vendor teams with one or more professional services firms to meet agency requirements.

© 1990 by INPUT. Reproduction Prohibited.

4. Contract Types

The federal agencies surveyed indicated that they have a slight preference for using a mixture of types of contracts for professional services, as shown in Exhibit IV-14. This preferred approach is a mixture of cost-plus, fixed-price, and other types of contracts, including incentive, fixed labor, and time-and-materials contracts. Many respondents recognize the inherent difficulties in pricing programming and analysis projects by preferring cost plus contracts in this area, and reserving fixed-price contracts for situations where the requirements are well defined.

EXHIBIT IV-14

Federal Agency Contract Type Preference for Professional Services

Contract Type Preference	Percent of Respondents	Reasons Cited
Cost-Plus	6	Research oriented/ developmental services
Cost-Plus Incentive Fee	30	Nonspecific requirements Innovative/creativity More valuable to agency
Fixed-Price	30	Requirements well defined Reduce government liabilities Government retains control
Mixed/Other	34	Depends on type of service Time and materials gives flexibility

Agencies were also queried on the future use of Multiple Award Basic Ordering Agreements to acquire professional services (see Exhibit IV-16). Some agency officials have limited experience with BOAs, but expected use to increase as a means of reducing procurement lead time. GSA, in particular, has taken the lead in establishing Systems Engineering and Technical Assistance (SETA) contracts. These are issued from both the regional offices (for regional coverage) and the GSA's Office of Technical Assistance (OTA) in Falls Church, VA (for national coverage).

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-15

Changes in Agency Use of Basic Ordering Agreements (BOAs)

Change in BOA Use	Percent of Respondents
Increasing	67
Decreasing	17
Remaining the same	8
Little experience	8

F

Projected Trends in the Use of Professional Services

1. Increases/Decreases in Contracting

Past surveys have shown that agencies have little interest in increasing professional services contracting. This corresponds with high-level agency budget data, as well as INPUT's compilation of professional services opportunities. While they do not expect increases in the programs they manage, more programs are being contracted out. At any rate, the survey data reflect dampening growth prospects in some professional services delivery modes.

2. Transition/Conversion to In-House Support

When a professional services contract is completed, the government is faced with a choice—should the continued support be transferred in-house, or should that continued support be obtained from a vendor? The civil agencies preferred to convert the program to contractors for continued support services. Half of the DoD agencies surveyed had no clear policy and made a decision based on the circumstances of the specific project.

As a follow-up to this question, INPUT asked the government agencies surveyed to reveal any plans to either convert professional services contracts to in-house or to convert in-house support functions to outside contractor support. Exhibit IV-16 shows that while there are many more plans to convert in-house support to outside contractor support than vice versa, there is a growing body of agencies with plans to move services and support from contractors to in-house. With the current shortfall of staff and funds, it may be that these plans more accurately reflect con-

© 1990 by INPUT. Reproduction Prohibited.

tract prioritizations; that is, only priority projects will be contracted and other projects will be scheduled as time and money permit.

EXHIBIT IV-16

Agency Plans for Conversion of Current Professional Services and Support

Planned Conversion	Percentages	
	Civil Agencies	DoD Agencies
From contractor to in-house staff	24	30
From in-house staff to contractor	51	60
No conversion plans	25	10
Total	100	100

3. Reasons for Transition/Conversion

In a few reported instances, the reasons the government agencies planned to convert professional services contracts to in-house support were to reduce costs and to minimize reliance on contractors. The DoD was more concerned about cost reduction, and the civil agencies, except for NASA and Energy, were more concerned about minimizing their dependence on contractors. The application areas in use by the agencies are primarily those of a general business type. In NASA and Energy, facilities and ADP operation are readily contracted out to relieve the scientific and technical in-house staffs. The Navy has a program to bring various types of engineering support in-house.

The reasons the government agencies planned to convert in-house functions to outside contractor support were to:

- Take advantage of expertise not available within the government
- Balance workloads and supplement in-house staffs
- Reduce costs
- Expedite services to the public
- Satisfy the requirements of government policy, in particular OMB Circular A-76

© 1990 by INPUT. Reproduction Prohibited.

Almost all types of applications are planned for conversion to outside contractor support. The majority of the candidate applications are administrative in nature. Those to be converted to satisfy the requirements of OMB Circular A-76 are primarily in the areas of applications software maintenance and operations and maintenance of hardware.

Many agencies were more reluctant to contract out for mission critical systems, expressing the need for better control. However, NASA remained a notable exception to this trend.

4. Factors Affecting Future Use of Professional Services

From the perspective of the government respondents, the nontechnical factors that were expected to affect the future use of professional services by the federal government were the same for both defense and civil agencies, as shown in Exhibit IV-17. However, the degree of impact of these factors differs.

Funding issues headed the list of concerns for both civil and DoD agencies, but more civil respondents mentioned this factor. This suggests that civilian agencies were reflecting the priorities of the Bush Administration. Recent research has shown a shift in that trend toward funding limitation, reflecting defense budget increases limited to inflation. Further, most of the defense funding is for for programs already in place, rather than for new initiatives and therefore new opportunities.

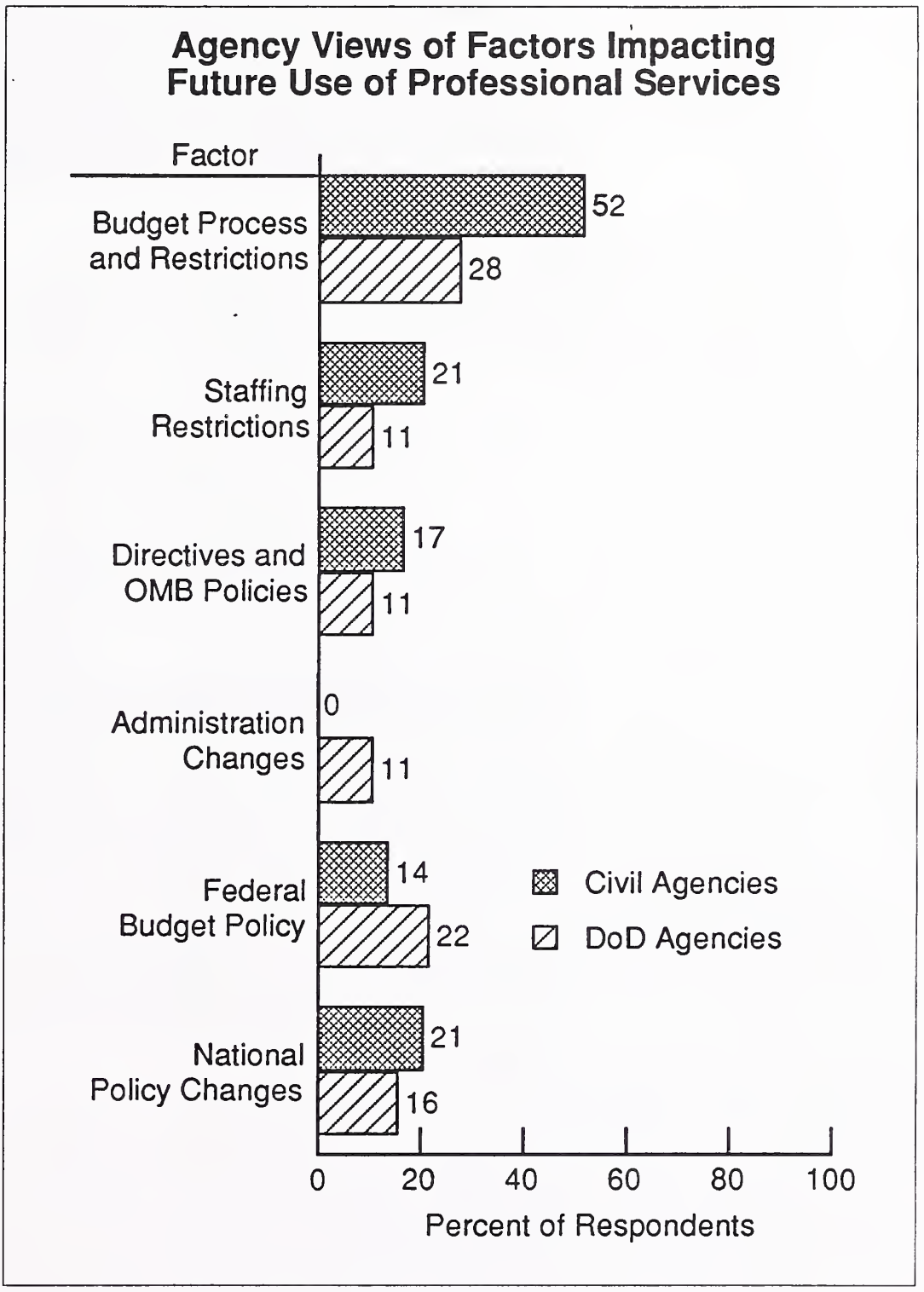
Directives and OMB policy factors continued to be an issue, with marginally more civil respondents perceiving a significant impact on future use of professional services. Agency respondents cited that the OMB Circulars, especially OMB A-120, which contains guidelines for use of consulting services, have made it more difficult to contract for professional services. Some respondents commented that they are hopeful that the proposed revisions to the FIRMR will clarify the definition of ADP support services and provide some assistance to contracting officials.

Included with directives and OMB policies, GSA policies were noted because they are in a state of change. Many respondents believed that the General Services Administration was attempting to make it easier for agencies to buy services. This reflects the need for better management within the federal government and the sense that the current administration has little faith in the ability of civil servants.

There are, however, countervailing trends. Recent changes in leadership at both GSA and the House Government Operations Committee have signaled a shift in GSA's policies. GSA's style of accommodation and facilitation—notable in the Frank Carr era—is giving way to a more confrontational relationship between GSA and the agencies. This is because of congressional pressure, from John Conyers and others, to find

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-17



out why ADP systems overrun their projected costs and to ferret out unfair procurements.

Federal personnel policies were also identified as an incentive to increase the use of professional services firms. Practically all agency executives that INPUT interviewed cited difficulty in hiring staff with strong techni-

© 1990 by INPUT. Reproduction Prohibited.

cal credentials. In the Washington area, at least, good candidates can frequently obtain higher salaries and better benefits in the private sector than in the government. Many government employees with fewer than 15 years of service are leaving government. Thus, agency executives, usually with more than 20 years of service themselves and looking toward retirement, must contract out most of their technical support activities.

Another critical need exists in the area of contract administration. Contracting Officers' Technical Representatives (COTRs) are often inadequately trained for their jobs. This leads to their insecurity, manifesting itself in two unfortunate ways:

- Some COTRs accept virtually everything the vendor tells them, leading to poor government oversight of the contracted project, and

- Some COTRs accept virtually nothing the vendor tells them, finding security in doing everything by the book. This often leads to delays and inadequate attention to the government's real problems.

GSA's training initiatives for the Trail Boss program are a major step toward improving contract administration. Through Trail Boss, agency executives are expected to learn, among other things, the proper techniques for dealing with contractors. This knowledge may then trickle down to the staff that deals directly with contractors on a daily basis. The good COTR is fair, flexible, but sometimes firm. As agencies increase their dependence on professional services firms, better contract administration will likely result.

Agency representatives were also asked to identify technical factors that would alter their agency's professional services plans. More than 25 factors were identified, and the five that were named most frequently are listed in Exhibit IV-18.

The personal computer has a two-way effect on the federal professional services market. On one hand, their greater functionality and wider penetration have increased federal end user computing, thus reducing the need for contract programmers. On the other hand, many agencies require more trainers and consultants to support these end users. Thus, while ranking first in agency surveys, personal computers are exerting opposing forces on the market.

Historically, defense agencies have installed more local-area networks (LANs) than civilian agencies. Therefore, it is not surprising that defense agencies would rank LANs higher. However, this is changing, particular with some activities at NASA, Energy, and the Commerce Department. Therefore, future surveys will likely show that more civilian agencies are installing LANs.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-18

Technological Factors Affecting Future Government Spending for Professional Services

Factor	Ranking*	
	Civil Agencies	DoD Agencies
Evolution in use of personal computers	1	1
Developments in software development and maintenance	2	4
Improvements in end-user capabilities	3	5
Changes in microcomputer architecture	4	2
Proliferation of LANs	5	3

* Rank based on frequency of mention by respondents.

5. Future Suggestions for Improvements to Vendor Services

Agency respondents were questioned about how vendors might make their professional services more valuable to the federal government over the next five years. As should be expected, the replies varied due to the different experiences the respondents have encountered with vendors (see Exhibits IV-19 and IV-20).

The responses were normalized somewhat to present coherent views. However, responses from civilian and defense agencies were not always comparable. The civil agency responses focused primarily on the relationships between federal and vendor personnel. Defense agency comments, on the other hand, focused more on the level of technology support, in terms of products, services, and personnel. Both groups stressed the need for better understanding of agency needs, suggesting that vendors need to empathize better with their clients.

Agency representatives also gave responses to the question of how effectively vendors completed teaming arrangements. Respondents were in agreement that vendors are already doing a fair job, but that some improvements could be made. Shortcomings are in the area of acquiring specialization, project management, and staff expertise. Also noted are significant problems among teaming members and a lack of communication with the government in the forming of teams to respond to government needs. In some cases, agency executives find themselves in the position of arbitrating disputes among team members.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT IV-19

Civil Agencies' Suggestions for Improvements to Vendor Services

Suggestions	Rank*
Increase cooperation and responsiveness to agency needs	1
Increase experience of staff	2
Increase adherence to agency pricing policy	3
Increase management skills	4
Increase availability of off-the-shelf software	5

*Rank based on frequency of mention by respondents.

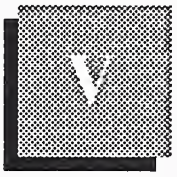
EXHIBIT IV-20

Defense Agencies' Suggestions for Improvements to Vendor Services

Suggestions	Rank*
Increase availability of integrated services	1
Increase awareness of DoD standards	2
Increase use of fourth-generation tools for development	3
Increase work force's knowledge and ability	4
Increase awareness of agency requirements	5

*Rank based on frequency of mention by respondents.

© 1990 by INPUT. Reproduction Prohibited.



Competitive Trends

A

Vendor Participation

Exhibit V-1 displays a profile of vendor respondents from three perspectives—total corporate revenue, professional services revenue, and percentage of professional services revenue from the federal government. This data was developed primarily from earlier survey efforts. The vendor respondents represented many of the largest professional services suppliers to the computer industry as a whole and to the federal government sector.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-1

Revenue Characteristics of Respondent Professional Services Vendors

Corporate Revenue ($ Millions)	Percent
Less than $500 million	38
$500 million-$1 billion	24
Over $1 billion	38

Professional Services Revenue ($ Millions)	Percent
0 to 100	8
100 to 250	25
250 to 500	42
Over 500	25

Government Percent of Professional Services Revenue	Percent of Vendors
Less than 20%	8
20% to 80%	24
80% to 100%	68

The vendors surveyed generally sold each of the categories of professional services shown in Exhibit V-2. Revenue distribution parallels the industry, with software development and consulting as the primary revenue sources.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-2

Types of Professional Services Provided by Respondents

Category	Proportion of Respondents		
	Currently Providing (Percent)	Plan to Provide (Percent)	Average Percent of Respondent Revenues
Consulting Services	92	100	29
Education and Training	75	83	5
Software Development	92	100	30
Systems Operations	42	67	22

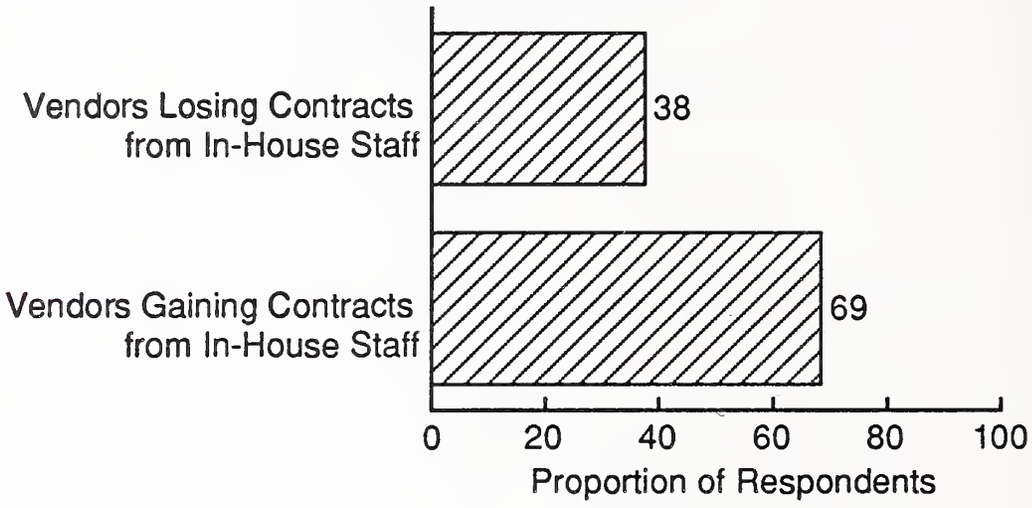
Vendors planned to provide additional professional services in the future in response to demands from government clients. A primary reason for this increased demand was the government's emphasis on OMB A-76 policy. In addition, some of the government clients preferred a single contractor to be responsible for all aspects of developed systems.

As depicted in Exhibit V-3, vendors acquired professional service contracts for support functions (that were previously performed in-house) more frequently than they lost them. The percent of contracts gained from in-house staff remains roughly the same as in an earlier study, but the share of vendors experiencing a loss of contracts has declined. This situation seems to reflect the agencies' continuing shortage of in-house staff available to perform support services. INPUT expects this trend to continue with more central design activities (CDA), especially in defense, being contracted out.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-3

Professional Services Competition from In-House Government Staff



Note: Total exceeds 100% because the results were not mutually exclusive.

As shown in Exhibit V-4, the experience of the vendors surveyed is that most frequently the follow-on support for professional services contracts with the government for design, programming, and analysis was provided outside the agency by the original vendor. In-house follow-on has decreased rapidly, while third-party follow-on has kept pace at approximately the same amount as previously reported.

EXHIBIT V-4

Source of Follow-on Support for Professional Services Contracts

Source of Follow-on Support for Completed Professional Services Contracts	Proportion of Respondents (Percent)
In-house by government	8
Outside agency by original vendor	77
Outside agency by another vendor	15
Total	100

© 1990 by INPUT. Reproduction Prohibited.

- The type of work moved in-house to government staffs typically ranges from software maintenance to consulting, analysis, and systems operations. Applications range from administrative and financial systems to avionics systems and shipboard computing systems.

- The agencies' primary reason for moving the work in-house is to involve government personnel in the work and to eliminate reliance of the government on vendor personnel support of agency work. The Navy has embarked on an ambitious program in this area. A secondary reason is to reduce costs by minimizing the amount of effort assigned to maintain software systems. Infrequently, the decision to move the work in-house is part of an OMB A-76 cost comparison.

- The majority of the follow-on professional services support provided by vendors is for systems operations, but there are several instances of consulting, software development, and software maintenance. Applications include administrative and financial systems; data bases; shipboard weapons systems; and environmental, health, and energy systems.

- Most often the government utilizes contractors for follow-on support because either the agency does not have sufficient staff and/or the expertise to perform the tasks, or an OMB A-76 cost comparison indicates that contracting is more cost-effective.

B

Vendor Market Perceptions

1. Advantages/Benefits of Contracting

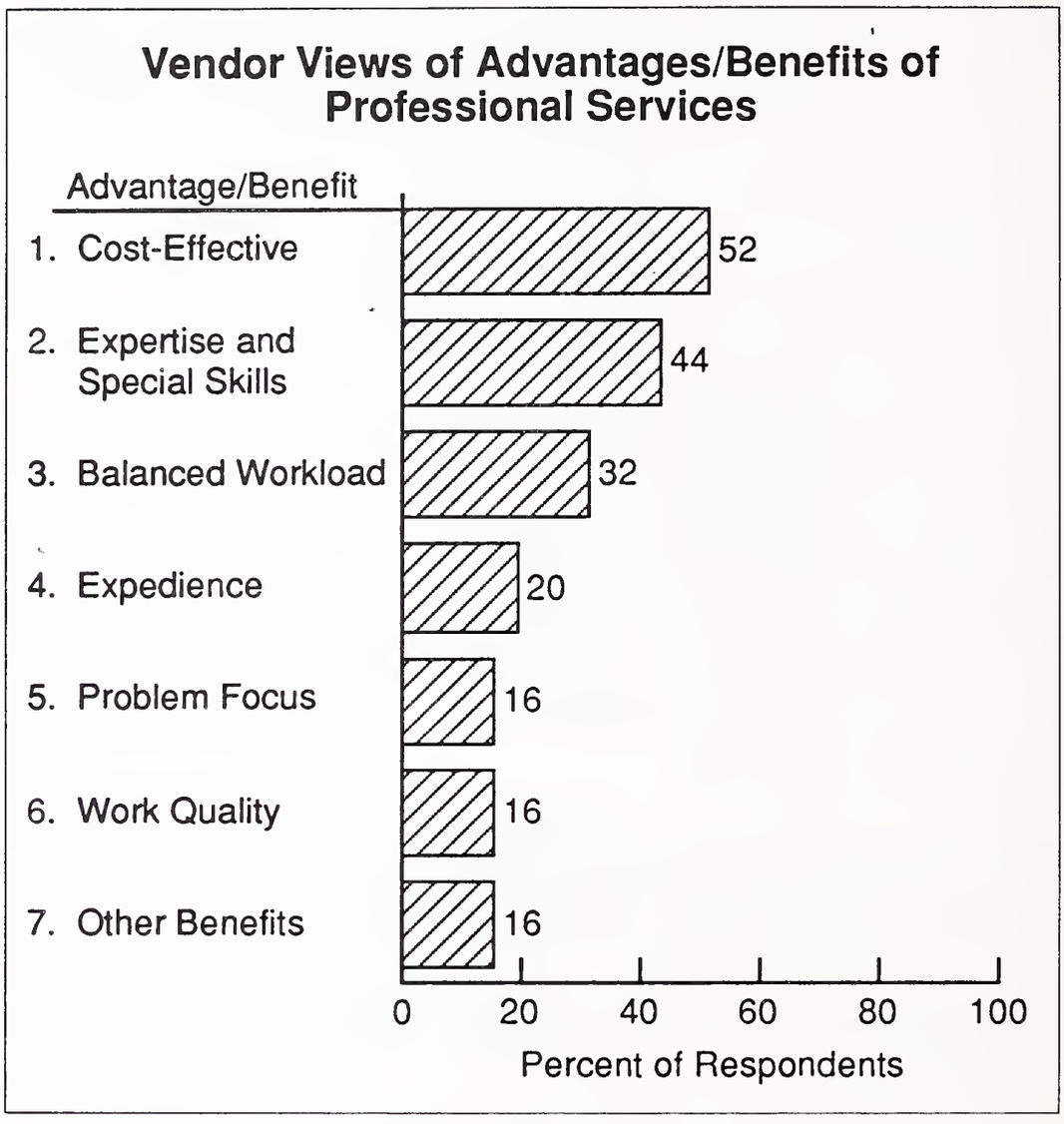
Vendors surveyed by INPUT typically had wide-ranging opinions about the advantages and benefits to the federal government of using professional service contracts. Vendor opinions are shown in Exhibit V-5. Similar agency perceptions were presented in Exhibit IV-9. Agencies placed more importance on expertise than vendors, and considerably less emphasis on cost than vendors.

- The ability to obtain expertise not available within the government agency is seen as a primary benefit for the government in contracting for professional services. Vendors believe that specialized skills are more easily obtained by contracting and that contractors can change the skill mix readily when the government's requirements change.

- Lower cost in achieving results is also seen as a primary advantage in contracting for professional services. Vendors believe that the competitive environment allows the government to contract for professional services in a very cost-effective manner.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-5



- The ability to balance workloads and augment in-house government staffs during peak workload times is considered an advantage because the government can start or stop work without any dislocation of in-house personnel. There is also an added cost benefit because reduction-in-force (RIF) costs are avoided.

- Expedience, or a means of getting work done faster without the inherent administrative problems of shifting personnel to perform the work in-house, is considered to be another significant advantage. Several vendors believe that there is less hassle and fewer problems associated with ADP if the work is performed by a professional services contractor.

- Some vendors believed that contractor employees are more motivated to perform than government employees.

© 1990 by INPUT. Reproduction Prohibited.

2. Disadvantages/Liabilities of Contracting

The vendor views of the disadvantages and liabilities of contracting for professional services shown in Exhibit V-6 are somewhat different than those expressed by government agencies, shown in Exhibit IV-9.

EXHIBIT V-6

- The major disadvantage identified by the vendors is associated with the actual procurement process. Vendors consider the government procurement process long and inflexible. They believe the government has a problem in evaluating quality versus price, and there is always the threat of a protest if the lowest-priced bidder does not win.

© 1990 by INPUT. Reproduction Prohibited.

- Dependence on the contractor is considered another major liability. If contracting does not allow the government in-house staff to build its skills, then when the contractor leaves, the expertise leaves. And when contracts are recompeted, some loss in continuity can occur if the incumbent is replaced.

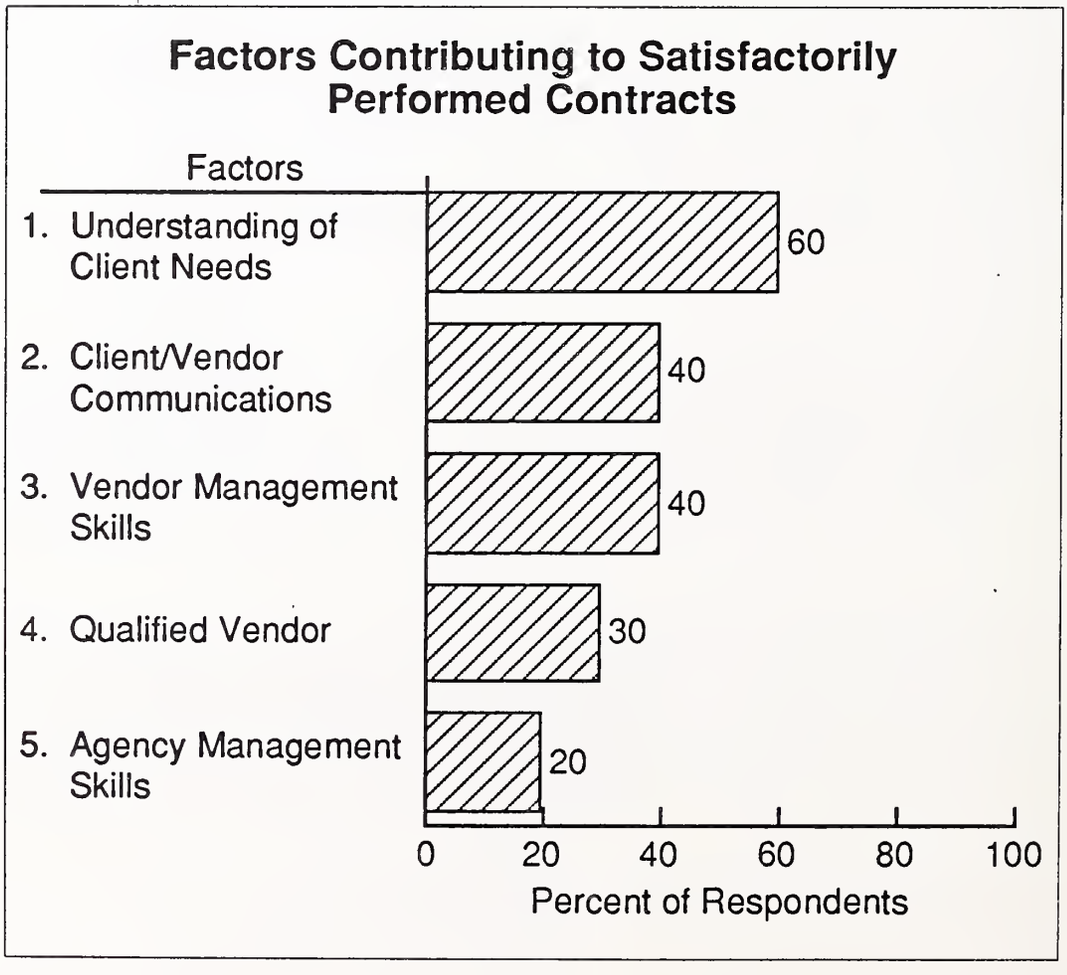
- Performance risk is another liability because the lack of government agency control over contractor personnel is a potential problem.

- Contract management is also considered a significant disadvantage. Some vendors stated that satisfying the complexities and legal obligations of a contract can pose serious problems through oversight or incorrect interpretation.

3. Poor/Satisfactorily Performed Contracts

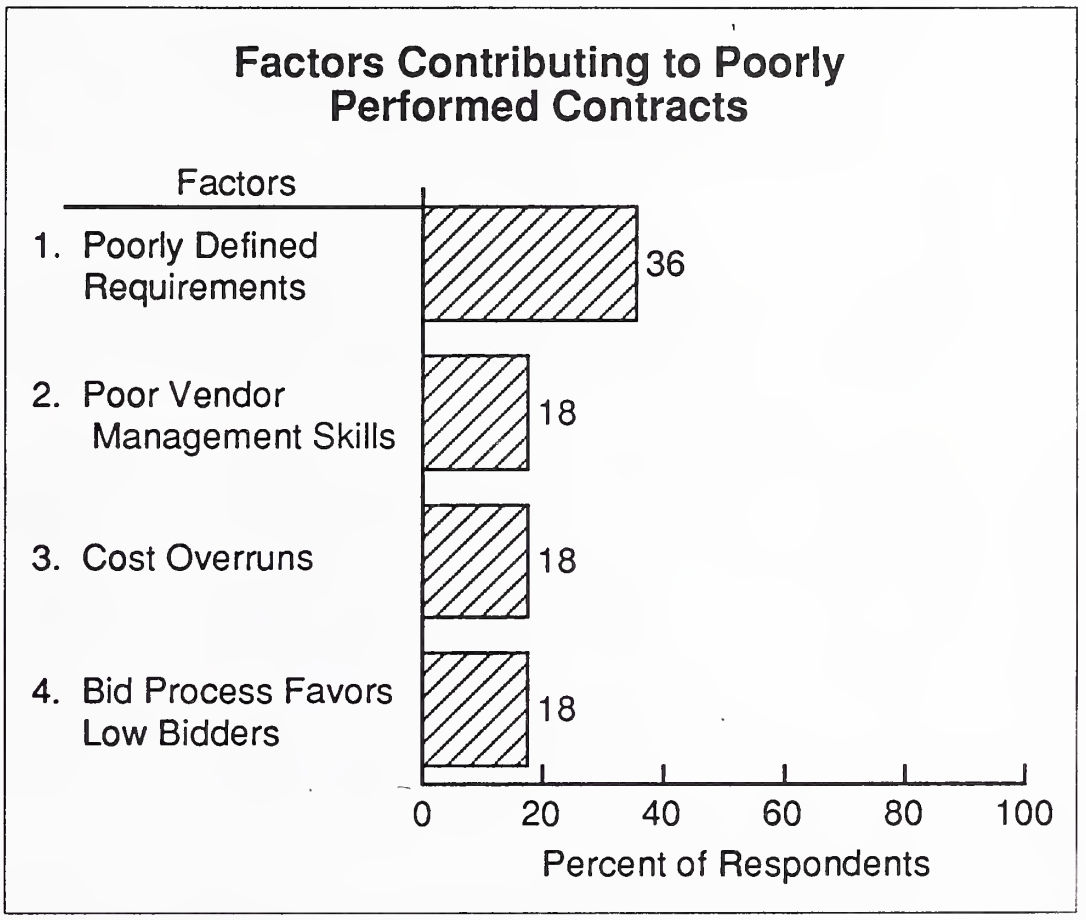
The factors that vendors believe affect the results of professional services contracts are illustrated in Exhibits V-7 and V-8. These project components were mentioned by vendors who contributed case studies for the 1990 update of this report.

EXHIBIT V-7



© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-8



a. Satisfactorily Performed Contracts

Vendors overwhelmingly stressed that the key to a satisfactorily performed professional services contract is an understanding of the client agency's needs. Well executed RFPs and task orders allow contractors to respond to agency expectations.

Another way agencies and vendors can help in achieving successful completed projects is to communicate with each other. Open lines of communication throughout a contract's life cycle create realistic attitudes, facilitate improved requirements understanding, and promote the vendor's image in the agency. Fresh and open discussions of systems alternatives contribute to a satisfactorily performed contract.

Just as poor vendor management skills can adversely affect a project, good skills obviously contribute to completing successful projects. Thorough work planning, progress review, project control, and qualified and stable contractor personnel are all necessary components of a satisfactorily completed contract. There should be sufficient contractual procedures, but they should not be overbearing.

© 1990 by INPUT. Reproduction Prohibited.

If the agency is also technically knowledgeable and possesses good project management skills, it can play an active role in monitoring the contractor's performance to assure compliance to the project's requirements and schedule.

b. Poorly Performed Contracts

Professional services contractors are faced with the difficult problem of meeting agencies' expectations when a S.O.W. is incomplete or when an RFP does not specify explicit requirements. Poor specifications tend to ensure poor contractor performance.

If vendors possess poor staff and project management skills, they will have problems in achieving successful completion of professional services contracts. On the other hand, contracts that impose unrealistic administrative procedures and reporting requirements will also adversely affect completion of the contract. Contractors must strive to place personnel with strong track records in managing successful projects and junior staff members. A winning team needs to be assembled. Vendor project managers must be able to reduce attrition and also provide for additional staff training if necessary. An unqualified staff will undoubtedly result in a poorly performed contract.

When a contractor exceeds budget allocations for a project, the contracting agency may be displeased even if the project's technical specifications have been met.

Vendors also mentioned that the bidding process itself contributes to producing poorly performed contracts. The lower bid is usually the winning bid, which does not assure that the best-qualified staff will be performing the project.

4. Differences between Commercial and Federal Government Markets

The industry respondents in an earlier study were asked to identify what they perceived to be the differences between the commercial markets and the federal market for professional services. These differences are presented in Exhibit V-9.

- Based on frequency of mention, the greater price sensitivity for acquiring services in the federal government was the most highly rated difference. Price is more of an issue in the federal market due to the bidding process, and also due to vendors supplying pricing information for GSA schedules. The second-most-noted difference was the complexity of the acquisition process in the federal government, compared to the purchasing procedures followed in the commercial market. The federal acquisition process is often lengthy and involves adherence to numerous regulations.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-9

Government versus Commercial Market Differences

Market Differences		
Federal Market	Commercial Market	Rank*
Greater price sensitivity	Less price sensitivity	1
Complex acquisition process	Simpler purchasing procedures	2
Wider range of evaluation criteria	Narrower basis for award	3
Lengthy phased development cycle	Shorter-term evolution	4
Subject to greater legal and economic constraints	Less rigid legal and economic constraints	5

*Rank based on frequency of mention by respondents.

- Surprisingly, pressure on profits was not included in the survey results. Unlike commodity vendors (hardware and packaged software vendors and telecommunications service providers), professional services firms are selling the time of expert people. The competitive environment makes it difficult to pay proper salaries in some contracts and then provide the appropriate multiplier. A 1988 report cited a government contract in which engineers were receiving $7.29/hour in wages and benefits. At that level, the government runs the risk of obtaining little or no usable support from the contractor.

- Another pressure on profits comes from cash flow, a particularly difficult problem in professional services contracts. Under DCAA rules, a government contractor may not bill out the interest expense associated with performing a contract. However, in many contracts, agencies withhold 10% to 20% of the incurred expenses until contract completion. If a contract runs more than a year and represents more than $100,000 in billings, cash flow problems can arise. This may discourage some small vendors from bidding on otherwise excellent government opportunities.

© 1990 by INPUT. Reproduction Prohibited.

5. Vendor Perceptions of Agency Opportunities

Professional service vendors differ as to which agencies they believe provide the most attractive opportunities. Some vendors have narrowed their federal government marketing to only the DoD agencies or selected civil agencies, while other vendors serve both.

Exhibit V-10 shows that 69% of the vendors conducted business with both the DoD and civil agencies. This percentage will increase over the next few years as more DoD vendors seek to expand their businesses to the civil side to offset declining defense spending. Frequent departmental targets include Treasury, NASA, Health and Human Services, Energy, and Transportation.

EXHIBIT V-10

Vendor Perception of Agency Opportunities for Professional Services

Agency Opportunities	Percentage
DoD and civil agencies	69
DoD agencies only	23
Civil agencies only	8

Over 20% of the respondents serve only the defense agencies. The smallest share of vendors concentrate their professional service business within the civil agencies.

In general, professional services vendors have not noticed agencies favoring contractor assistance for specific types of applications development or customization. Vendors contributing to the 1990 report noted that agencies tend to seek contractor assistance when applications require a high level of technical expertise to develop. Only the applications areas of logistics and financial software were cited by a small percentage of respondents, as shown in Exhibit V-11.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-11

Application Types Contracted to Professional Services Vendors

Application Types	Percent of Responses*
No Norm	86
Logistics	14
Financial	14

* Percentages do not add to 100% due to multiple responses.

6. Satisfaction Level

Vendors were asked what their perceptions were regarding the general level of satisfaction of government agencies with the performance of professional services contractors. The results are presented in Exhibit V-12.

Vendors believe the federal government is reasonably satisfied with vendor responsiveness to agency needs and quantity and quality of work. However, the satisfaction levels themselves given by the vendors are not very high. For several factors—notably cost and delivery schedule—vendors consider the government satisfaction level relatively low indeed.

This represented a fundamental problem for professional services vendors. Many of the vendors surveyed offered the comment that there needs to be increased emphasis on holding down costs and on timely delivery of the products and services.

In contrast, however, the contractors that provided case study material for the 1990 report believe that agencies are extremely satisfied with the results of contractors' efforts on their projects. The case studies exemplified achievable tasks and the breadth of services provided by the contractors. (see Exhibit V-13).

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-12

Vendor Perception of Agency Satisfaction with Professional Services Contractors

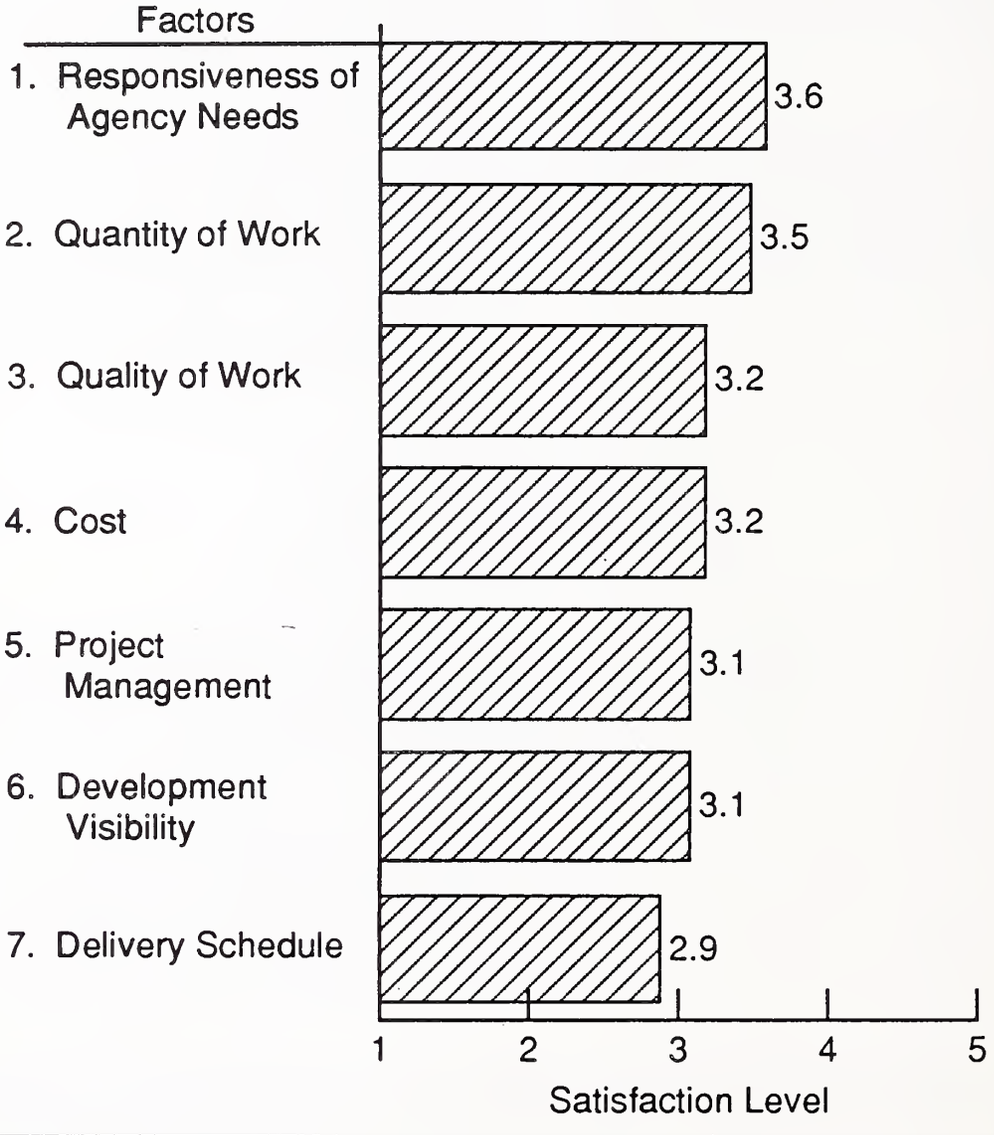


EXHIBIT V-13

Vendor Perception of Agency Satisfaction with Case Study Examples

Rating (1-5)*	Percent of Respondents
5	58
4	33
3	8

* Rating based on 1-5 scale, where 5 = extremely satisfied and 1 = not satisfied at all.

© 1990 by INPUT. Reproduction Prohibited.

C

Vendor Contracting Views

1. Available Contracting Vehicles

Vendors provide professional services to the government under a variety of contract types.

- Cost-plus contracts provide for vendor costs to be paid and a fee added that is either negotiated at the time of award (cost-plus-fixed-fee) or based upon the performance of the contractor in satisfying the contract requirements (cost-plus-award-fee). Cost-plus contracts regulate the margin of profit allowed, but clearly place the risk of overall cost with the government.

- Fixed-price contracts commit vendors to perform and complete a contract at a predetermined price ceiling. To a significant extent, the profitability associated with a fixed-price contract is dependent upon the vendor's ability to accurately appraise, in advance, the cost of providing services. Managing fixed-price contracts successfully requires an extremely well written and detailed statement of work and project scope. The risk of completion is placed on the vendor.

- Level of effort (LOE) or time and materials (T&M) contracts provide for a fixed-price hourly billing rate for the various labor categories to be applied to a contract plus reimbursement by the government for travel, supplies, equipment, and other materials required to satisfy the terms of the contract. The primary variable is the number of hours of each category to be used in performing assigned tasks. In many competitive situations, vendors are required to combine their contracts with a "not-to-exceed" clause that essentially imposes cost ceilings on the contract.

2. Preferred Contract Types

In earlier studies, vendors more clearly preferred a mixture of contract types in order to minimize their financial risks. However, as shown in Exhibit V-14, vendors now indicate a stronger preference for fixed-price contracts.

Adhering to fixed-price contracts has several implications for vendors. Vendors have shifted their contract preferences because they expect to experience decreasing profit margins and therefore will need to more accurately assess their costs of doing business and trim operations where possible. Furthermore, vendors were of the opinion that the DoD was attempting to limit the profits made by contractors.

A number of vendors classified LOE and T&M contracts as fixed-price since each hourly billing rate is fixed for the duration of the contract. As noted earlier, however, the federal government's general preference for overall lowest cost, or price, has led to a number of vendors offering bids with unpaid overtime or minimum wages for some technical levels.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-14

Vendor Preference for Contract Type for Professional Services

Preferred Contract Type	Percentages	
	Vendors	Agencies
Cost-plus/cost-plus incentive fee	23	36
Fixed-price	47	30
Mix	23	24
Other	7	10

The vendors were also evenly split in their preference for cost-plus and a mix of contracts. Vendors will continue to prefer a mixture of types of contracts in order to minimize their financial risk. This particularly applies to programming and analysis contracts where the financial risks are substantial.

Industry respondents were also exploring opportunities to provide professional services to federal agencies under Multiple Award Schedule Basic Ordering Agreements. Fifty percent of all the respondents surveyed in the 1989 study were providing services under BOAs. Contracts mentioned included FEDSIM, GSA, Energy, and DoD.

Half of the respondents in the 1990 update felt that SETA contracts are the best contracting vehicles for acquiring professional services, as shown in Exhibit V-15. According to the vendors, the users cannot attain the technical proficiency or the experience in various technical areas that a systems engineering firm can. SETA contracting is appropriate for those contracts with loosely defined requirements—it's a more flexible vehicle for the agency and for the contractor. It can also be a poor vehicle because it limits access to specialized workers that may be required for high-level studies.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-15

Vendor Perception of SETA Contracting for Professional Services

Perception	Percent of Respondents	Reasons
Best contracting vehicle	50	* Flexible
Poor contracting vehicle	25	* No access to high-level skill sets
No Opinion	25	

3. Characteristics of a Successful Contractor

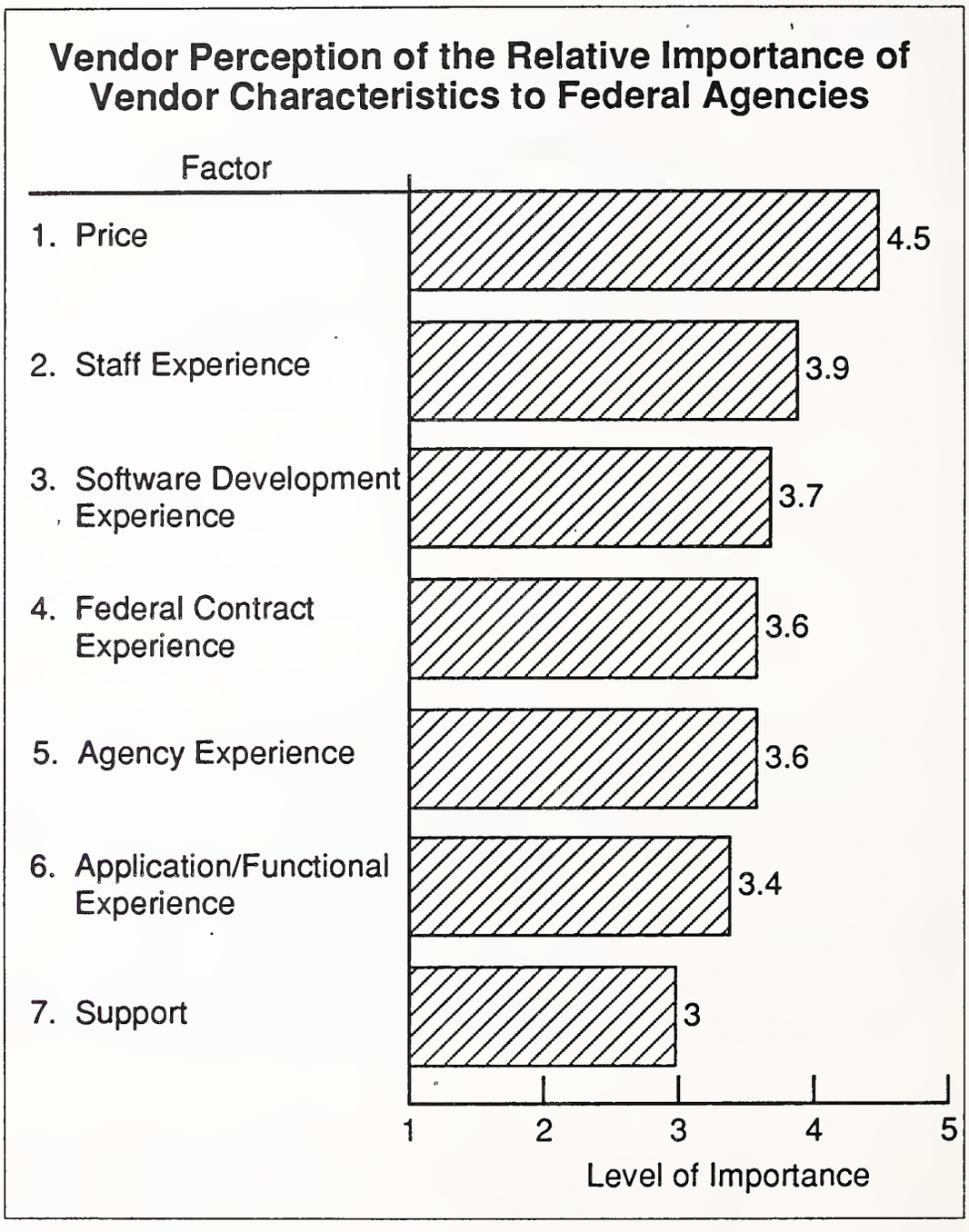
As shown in Exhibit V-16, the vendors ranked price, staff experience, and software development experience as the three most important characteristics of a successful contractor.

Support and hardware experience were rated as the least important of all characteristics by the vendors. As previously noted, these characteristics were reported by government respondents as important in winning a bid. This incongruence needs to be addressed.

One reason for the divergence of opinion was that agency respondents were looking at the situation after the bid had been awarded, whereas contractor respondents were primarily oriented toward getting the business rather than operating the contract. However, vendors should emphasize their support capabilities and experience in their bids. Unfortunately, it is INPUT's experience that most professional service vendors cannot provide evidence of customer satisfaction since they do not carry out systematic surveys in this area. INPUT's own surveys often return unexpected results, especially in highly focused areas.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-16



4. Perception of Most Attractive Product or Service

Vendors were asked which of their company's professional services or product capabilities they thought agencies found most attractive. The responses ranged from the specific categories of professional services under study in this report and extended to other products or services related to the vendors' areas of expertise (see Exhibit V-17).

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-17

Vendor Ranking of Attractive Products and Services to Government Agencies

Products/Services	Rank*
Software development	1
Consulting	2
Project management	3
Financial systems	4
Support	5

*Rank based on frequency of mention by respondents.

Vendors believe that software development is most attractive because:

- Most agencies are reluctant to use prepacked solutions—a situation that may now be changing.
- Qualified in-house technical staff are always in short supply.

The presence of financial systems is interesting, possibly reflecting the growing interest in standardization being promulgated by the Joint Financial Management Improvement Program. This item, which is an application area, does not fit with the other four, which are functional areas. For example, a financial systems contract could involve software development, consulting, project management, or support.

5. Selection Criteria

Vendors need to better understand and respond to the criteria used by the government in selecting a vendor for professional services. As shown in Exhibit V-18, vendor respondents considered the proposed technical solution the number-one selection criterion.

As noted in Exhibit IV-13, an earlier survey of agencies did not concur with the vendor perceptions, except in the area of proposed technical solution. Many vendors noted, however, that the technical solution is usually the entrance ticket to a price, not a cost, "shoot-out," where either the preferred or lowest-priced vendor wins.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-18

Vendor Perception of the Importance of Contractor Selection Criteria to Federal Agencies

Selection Criteria	Ranking*	
	Vendor	Agency
Proposed technical solution	1	1
Cost	2	4
Vendor reputation	3	2
Project management	4	5
Staff experience	5	3

*Rank based on frequency of mention by respondents.

D

Trends

1. Increases/Decreases in Professional Services

A majority of the vendors surveyed predicted an increase in the amount of professional services work with the government over the next two to five years, as shown in Exhibit V-19.

EXHIBIT V-19

Vendor-Expected Change in Contracting for Professional Services

Professional Services Category	Percent of Respondents			Average Change* (Percent)
	Expected Increase	Expected Decrease	No Change	
Consulting services	46	8	46	30
Education and training	31	-	69	7
Software development	38	8	54	30
Systems operations	39	-	61	25

*Change over the next five years, GFY 1988-1992.

© 1990 by INPUT. Reproduction Prohibited.

The majority of the vendors surveyed do not view the government's increased use of packaged software as hindering the professional services market. The respondents are of the opinion that there will still be ample opportunities for modification, installation, and training by professional service vendors. Furthermore, vendors commented that the federal agencies do not have the necessary in-house expertise to perform many of the software-related services.

In the 1988 study industry respondents were also asked their opinion on whether the government would increase its procurement of System Engineering/Technical Assistance (SETA). Eighty-four percent of the respondents felt that the government would increase its contracting for SETA due to the lack of federal personnel to accomplish these tasks. Vendors noted that some of the SETA awards may become part of other larger contracts at agencies.

2. Factors Affecting Government Spending

Vendors surveyed by INPUT suggested numerous factors that could increase or decrease federal government spending on professional services in the next five years. INPUT grouped these factors into the four categories presented in Exhibit V-20.

EXHIBIT V-20

Ranking of Factors Affecting Future Government Spending for Professional Services

Factor	Rank*	Positive or Negative Effect
Budget changes (authorization, appropriation, apportionment)	1	Negative
Government personnel availability	2	Positive
Regulatory policy changes	3	Positive
Price	4	Negative

*Rank based on frequency of mention by respondents.

- The most frequently mentioned factor was the effect of budget cuts and changes in authorization and appropriations on professional services spending.

© 1990 by INPUT. Reproduction Prohibited.

- The availability of government personnel was also considered an important factor. Included in this is not only the shortage resulting from congressionally imposed limits on agency staffing, but also the lack of sufficient numbers of specialists and managers in newer IRM technology within the government. Due to a lack of experienced personnel, agencies will be forced to seek the services of vendors.

- Regulatory policy changes, in particular OMB A-76 and OMB A-130, are considered to be important influences. Circular A-76 recommends the use of the private sector by federal agencies for services, and A-130 agency guidelines create more opportunities for professional services vendors.

- The cost of acquiring professional services was mentioned as a possible negative factor affecting future use of services by agencies. The more expensive a product or service is, the less likely it will be purchased.

3. Industry Trends Affecting Vendor Revenue

The factors that vendors believe will impact their professional services revenues were numerous and varied. INPUT listed the responses, in order of frequency mentioned, in Exhibit V-21.

EXHIBIT V-21

Ranking of Industry Trends Affecting Revenue in the Federal Market

Industry Trends	Rank*
New technology	1
Industry standardization efforts	2
Increased competition due to CICA	3
Consolidation of contracts	4

*Rank based on frequency of mention by respondents.

- Federal agencies are demanding the benefits of new technology in hardware, software, languages, and associated peripherals. Outside services will be needed to allow agencies to be more efficient in their use of new technological products.

© 1990 by INPUT. Reproduction Prohibited.

The impact of changing technology on vendors of professional services was explored further in the 1989 update (see Exhibit V-22). Vendors are forced to continually acquire additional technological expertise to keep up-to-date with new hardware and software products. They must be more flexible to offer a myriad of technical solutions to clients problems. The availability of enhanced programmer tools and "revisable software solutions" increases programmer productivity and reduces the associated costs to the government. The impact is seen in actual costs, not in how vendors interface with agencies.

EXHIBIT V-22

Impact of Technology on Professional Services Vendors

Impact	Percent of Responses
Acquire more technical expertise	57
Increase responsiveness	43
Increase programmer productivity	14
Impacts cost	14

- Professional services opportunities will also increase due to emerging federal standards. Outside contractors will be sought to provide assistance in designing new systems, and connecting existing systems in adherence to federal standards.

- The Competition In Contracting Act (CICA) was designed to bring fair and open competition to the contract award process. Opening the market to a greater number of vendors was believed by the respondents to be a major force shaping their future revenues. It prevents sole-source awards, and presents more opportunities for vendors. Several vendors noted that some new entrants appear to be niche players.

- Respondents expressed concern over the increase in the number of consolidated contracts by agencies, although this is not truly an industry trend . By creating an easier procurement process for agencies to secure services, the federal government has decreased the number of different opportunities for contractors and fostered more intense competition among vendors.

© 1990 by INPUT. Reproduction Prohibited.

4. Technology Trends

In an earlier study, 67% of the vendors were qualified in Ada, as shown in Exhibit V-23. These same vendors did not report having a great deal of contract work that required the use of this Ada expertise. Another 19% reported that they are planning to become qualified in Ada when it is required in order to acquire contracts for professional services work.

EXHIBIT V-23

Current and Planned Vendor Qualification in Ada

Status	Percent of Respondents
Vendors currently qualified in Ada	67
Vendors planning to become qualified	19
Vendors with no current plans for Ada	14
Total	100

Industry representatives were also asked to identify those technological factors that would alter the federal government's spending for professional services. The factors named most frequently are listed in Exhibit V-24.

- The increase in optical disk storage system capabilities was most frequently cited by the vendors as having a strong impact on future professional service acquisitions. Agencies are already seeking to procure these optical disk storage systems as they attempt to upgrade their major information systems. Strong and continuing consulting support is needed to assist agencies in taking advantage of these systems.

- Artificial intelligence is gaining in usage in tactical situations, automated planning, and support applications throughout the DoD. Large-scale information processing is the principal area of applications for AI as it is developing in the civilian agencies.

- Standards are being established through a consensus of federal regulatory and standards organizations, industry organizations such as ANSI and IEEE, and the vendor community. Progress toward development of OSI standards is being realized through the recent cooperation of U.S. industry and governmental efforts. OMB is considering mandat-

© 1990 by INPUT. Reproduction Prohibited.

ing the use of OSI-compatible systems throughout the federal government. The issuance of a government-wide policy for OSI would help to aggregate the market and establish consistency with commercial product development.

EXHIBIT V-24

Vendor Ranking of Technological Factors Affecting Future Government Spending for Professional Services

Factor	Rank*
Increase in optical disk storage capabilities	1
Developments in artificial intelligence	2
Standardization efforts	3
Developments in interface capabilities	4
Increase in use of supercomputers	5
Telecommunications developments	6
Increased use of fiber optics	7

*Rank based on frequency of mention by respondents.

E

Recommendations

Vendors should resign themselves to the fact that, while program managers may prefer incentive contracts, most contracting officers will prefer to do business on a fixed-price basis. Vendors need to find, and put into practice, methods of pricing and managing professional services contracts that allow them to minimize the risk of poor 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 need to make maximum use of automated tools to increase their productivity. Exhibit V-25 addresses this recommendation and those that follow.

Given the various federal consolidation and standardization initiatives, such as GOSIP, any service that stresses standards or interoperability will likely fare well. For example, at this writing only three companies—AMS, CDSI, and KPMG Peat Marwick—offer financial software packages that comply with JFMIP Core requirements. These companies are obtaining significant professional services business in connection with these packages.

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT V-25

Recommendations

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

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. While this appears to contradict some earlier stated agency opinions, the need to empathize with agency customers is frequently seen as desirable.

Vendors should also be aware that, especially in the civil agencies, their reputation is an important factor in winning work with an agency. The government is a small community, and a questionable reputation with 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. This should not be done through the field staff but by a central organization. In at least part of the survey, an independent third party should be employed to prevent biases and provide objective standards.

Vendors can make more effective use of their marketing budget if they emphasize their 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 than technology or defense.

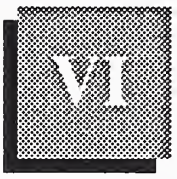
© 1990 by INPUT. Reproduction Prohibited.

The surveys of government agencies revealed projected increases in the amount of future contracting for systems operations. In addition, similar increases are projected for software development. This type of work requires specialized expertise that not all vendors possess; however, vendors that do should ensure that they 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 financially more rewarding.

Opportunities for involvement with the increasing number of government supercomputer installations will require new programming and engineering skills that closely match the proposed areas of application. Vendors interested in this submarket need to carefully research the target to ensure future business prospects.

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Professional Services Opportunities

A Future Programs

Funding for professional services is provided in several budget categories of federal government agencies.

- Both support and direct investigation may be funded by research and development (R&D) elements.
  - Direct investigation may be identified in the R & D program descriptions.
  - Support services may be included in a general support budget element.
- Professional services acquired through procurement funding may be separately identified or included in an overall information system acquisition.
- Professional services oriented toward systems operations (facilities management) will not be specifically identified within O&M or administrative budget elements of the agencies.

Most medium and smaller professional services projects and tasks, valued at less than $2 million, are rarely identified in agency budget documents, unless specifically related to an information technology R&D project.

New professional services opportunities that are larger than $1-2 million are listed in at least one of the following federal government documents:

- OMB/GSA Five-Year Plan, which is developed from agency budget requests submitted in compliance with OMB Circular A-11
- Agency long-range information resource plans developed in response to reporting requirements of the Paperwork Reduction Act of 1980, as amended

© 1990 by INPUT. Reproduction Prohibited.

- Agency annual operating budget requests submitted to both congressional oversight and appropriations committees based on the OMB A-11 information

- OMB Circular A-76 agency support services review schedules for conduct of cost comparisons on a site-by-site, year-by-year basis

- *Commerce Business Daily* for specific professional service opportunities, for qualifications as a bidder, and for obtaining a copy of the RFP or RFC

- Five-Year Defense Plan, which is not publicly available, and the supporting documentation of the separate military departments and agencies. Segments usually available include the R-1 (RDT&E Budget Request) and the P-1 (Procurement Budget Request), and classified program documentation available to qualified DoD contractors.

The programs identified in this report are typical of this market, but the list is not all-inclusive.

- Professional services is the largest market segment of the federal government and is expected to remain so during the near future.

- Most professional services contracts are multiyear, employing options or contract modifications to remain in force for a given vendor.

- With only a few exceptions, most services contracts are limited to three to five years in duration and require that the services be recompeted periodically.

The list of opportunities becomes smaller after FY 1991 because new programs have not yet been identified or initially approved by the responsible agency. Subsequent issues of this report and the INPUT Procurement Analysis Reports will include additional programs and detailed program information for FY 1991 to FY 1995.

All funding proposals are based on cost data of the year submitted—with inflation factors dictated by the Administration as part of its policy—and are subject to revision, reduction, or spreading to future years in response to congressional direction. Additional reductions are likely in FY 1991 and beyond due to the deficit reduction constraints of the Gramm-Rudman-Hollings Act or direct Congressional action.

© 1990 by INPUT. Reproduction Prohibited.

B

Professional Services Opportunities by Agency

Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Air Force			
Data Services Contract for AFAL	V-1-21		
System Engineering Support for NORAD Computer System	V-1-30	4/1/91	5.0
Enhanced Sorts Capability Assessment Module	V-1-112	10/1/91	
Standard Software Requirements Contracts I and II	V-1-121	1/1/91	3,000
Automated Records Management System	V-1-124	1/1/91	
WWMCCS Follow-on Maintenance Contract	V-1-130	10/31/91	600.0
Launch Support Services Contract	V-1-133	10/1/91	50.0
Continuous Engineering and Technical Services	V-1-134	3/1/91	103.0
Operations & Maintenance of the Air Force Weapons Laboratory	V-1-135	5/1/91	35.0
Operations & Maintenance of Western Space and Missile Center	V-1-136	4/1/91	400.0
SETA for Flight Test Center	V-1-137	10/1/91	40.0
Test Range Support	V-1-138	1/1/92	325.0

© 1990 by INPUT. Reproduction Prohibited.

Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Army			
Installation Support Modules	V-2-45		
High Energy Laser System Test Facility	V-2-49	1/1/91	80.0
Common Hardware/Software II	V-2-51	7/1/91	2,000.0
Information Systems Software Center—Technical Support	V-2-54	1/1/95	116.0
Navy			
China Lake Omnibus ADP Support Services	V-3-5	10/1/92	105.0
Enhanced Naval War-gaming System Software Maintenance	V-3-66	5/1/91	14.0
ADP Support Services	V-3-95		
Production Management Information System	V-3-101	1/1/91	
Information Engineering II	V-3-104		
Shipboard Non-Tactical ADP Program	V-3-113	9/1/92	155.0
Facilities Management of the Central Computing Center	V-3-115	2/2/94	5.0
ADP Systems Development and Support Services	V-3-118	10/1/93	3.0
Operation and Maintenance Services for the Range Data System	V-3-119	10/1/91	24.0

© 1990 by INPUT. Reproduction Prohibited.

Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Operation/Developmental Support	V-3-122	1/1/92	26.8
Marine Corps			
Marine Air Ground Task Force Automated Services Center	V-3A-4	10/1/91	
Defense			
Corporate Information Management	V-4E-7		
Agriculture			
Systems Technology and Telecommunications Enhancement Program	VI-5-37	10/1/92	
Energy			
Licensing Support System	VI-7-87		200.0
Operations and Maintenance of ADP and Communications	VI-7-94	10/1/92	13.0
Health and Human Services			
HCFA Data Center	VII-8-33	10/1/92	9.3
Administrative and Scientific ADP Support Services	VII-8-41	1/1/93	13.0
Interior			
Bureau of Land Management ADP Modernization Project (ALMRS)	VII-9-11	4/1/91	500.0
Coal Data Management Information System	VII-9-12		

© 1990 by INPUT. Reproduction Prohibited.

Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Earth Resources Observation System Data Center	VII-9-17	4/1/91	40.0
Facilities Management Services	VII-9-28	1/1/93	1,000.0
Justice			
Antitrust Office Automation	VII-10-17		9.15
Automated Litigation Support	VII-10-20	1/1/91	120.0
ADP Support Services	VII-10-28	10/1/92	7.8
Office Automation	VII-10-31	1/1/92	44.0
ADP Support Services	VII-10-32	10/1/94	
Transportation			
ADP Support Services Contract	VII-11-30	1/1/92	210.0
Recruit Information Management System	VII-11-35		1.5
Instrument Approach Procedures Automation Project	VII-11-37	1/31/91	36.2
Real-Time Weather Processor Program	VII-11-39	4/1/91	
Personnel Management Information System	VII-11-40		
Treasury			
Tax Modernization Effort	VII-12-6		296.6
Automated Commercial System	VII-12-51	1/1/91	286.5
Data Administration	VII-12-54		2.8

© 1990 by INPUT. Reproduction Prohibited.

Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Software Development and Operational Support Services	VII-12-61	10/1/92	
Corporate Files On-Line and Corporate Systems/ Mirror Imaging	VII-12-66	1/1/91	531.2
Expansion of Bureau's Computer Processing Capacity	VII-12-70	2/1/91	21.9
Education			
Pell Grant Program	VII-13-13	10/1/92	148.9
Labor			
Enhanced Federal Employees Compensation System	VII-9A-4		40.2
Contract for Host Computer Services	VII-9A-10	1/1/92	9.5
Technical Support Services	VII-9A-12	5/1/91	11.1
State			
Co-Processing Facility	VII-9C-2	6/1/91	38.7
Office Automation Recompetition	VII-9C-6	9/1/95	
GSA			
Multiple Award Schedule Program	VIII-14-3		317.4
Contract Services Program	VIII-14-10		1,500
PBS Task Order Support	VIII-14-11		

© 1990 by INPUT. Reproduction Prohibited.

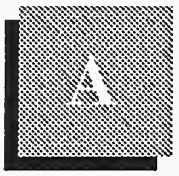
Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Concept Paper for Acquisition Automation	VIII-14-19		
Replacement PBS/IS (STRIDE)	VIII-14-23	2/1/91	72.9
NASA			
Flight Analysis and Design System (FADS)	VIII-15-53		
NASA Occupational Health Management Information System	VIII-15-70		
Program Support—Communications Network	VIII-15-73	1/1/95	216.0
Earth Observing System Data Information System	VIII-15-85	2/1/91	500.0
Scientific Computer Operations Programming and Analysis	VIII-15-90	10/1/91	27.0
Computational Mission Services at MSFC	VIII-15-91	10/1/95	71.7
Technical Support Services	VIII-15-93	10/1/93	50.0
Data Communications Support Services	VIII-15-94	10/1/94	
White Sands Test Facility Support	VIII-15-95	10/10/93	170.0
Veterans Affairs			
Veterans Benefits Administration Modernization Plan	VIII-16-11	1/1/91	

© 1990 by INPUT. Reproduction Prohibited.

Agency/Program	PAR Reference	RFP Schedule	FY1991-FY1995 Funding ($M)
Federal Emergency Management Agency			
Regional Integration of the FEMA Financial System	VIII-18-5		9.3
Integration Management and Economic Analysis System (IMEASY)	VIII-18-8	1/1/92	0.75

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Professional Services Interview Profiles

A

Federal Agency Respondent Profile

Contacts with agencies were made both by telephone and through on-site visits.

1. Contact Summary

The distribution of job classifications among individual agency respondents for the 1987 and 1988 reports were as follows within DoD and civil agencies:

	Policy	Buyers	Users	Total
Civil	14	10	11	35
DoD	7	2	4	13
Total	21	12	15	48

2. List of Agencies Interviewed

Department of Agriculture
- Economic Management Service
- ASCS
- Soil Conservation Service

Department of Commerce
- International Trade Administration
- Office of Information Policy and Planning
- Office of Procurement Management
- Patent and Trademark Office

Department of Defense
- Air Force
  - Office of the Secretary
  - Military Airlift Command
  - Communications Group
  - Logistics Command

© 1990 by INPUT. Reproduction Prohibited.

- Army
  - DARCOM
  - Civil Personnel Center
- Navy
  - Office of NALTOACS Program
  - Navy Medical Command
  - Space Command
- Defense Logistics Agency
- Office of Secretary of Defense

Department of Education
- Office of Information Resources Management

Department of Energy
- Information Systems Division
- Office of ADP Services

Department of Health and Human Services
- Office of the Secretary
- Social Security Administration
- Public Health Service

Department of Housing and Urban Development
- Computer Services Group
- Office of Acquisition Management

Department of Interior
- Office of Information Resources Management
- Office of Management Analysis

Executive Office of the President

Department of Justice
- Drug Enforcement Agency
- Federal Bureau of Investigation

Department of Labor
- Office of Information Resources Management

Department of Transportation
- Office of Information Systems and Telecommunications Policy
- Federal Aviation Administration

Department of the Treasury
- Secret Service
- Office of Information Resources Management
- Internal Revenue Service
- Bureau of Public Debt

© 1990 by INPUT. Reproduction Prohibited.

Environmental Protection Agency
- Office of Information Management

General Services Administration
- Office of Information Resources Management
- Office of Software Development and Office Technology (2)
- FEDSIM

National Aeronautics and Space Administration
- NASA Headquarters—Office of ADP Management
- Langley Research Center (2).

Securities and Exchange Commission

Veterans Administration

B

Vendor Respondent Profile

For the 1987 study, INPUT contacted a representative sample of contractors that provide professional services to the federal government.

Job classifications among individual vendor respondents included marketing as well as administrative executives.

Interviews with vendor personnel were conducted by telephone and by mail.

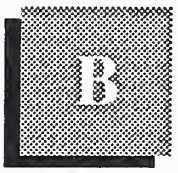
C

Case Study Respondent Profile

Respondents that provided case study profiles on professional services projects included prime contractor representatives, or agency program managers. For some projects, both the prime contractor and the agency collaborated in supplying profile information.

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Definitions

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

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

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

A
Delivery Modes

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

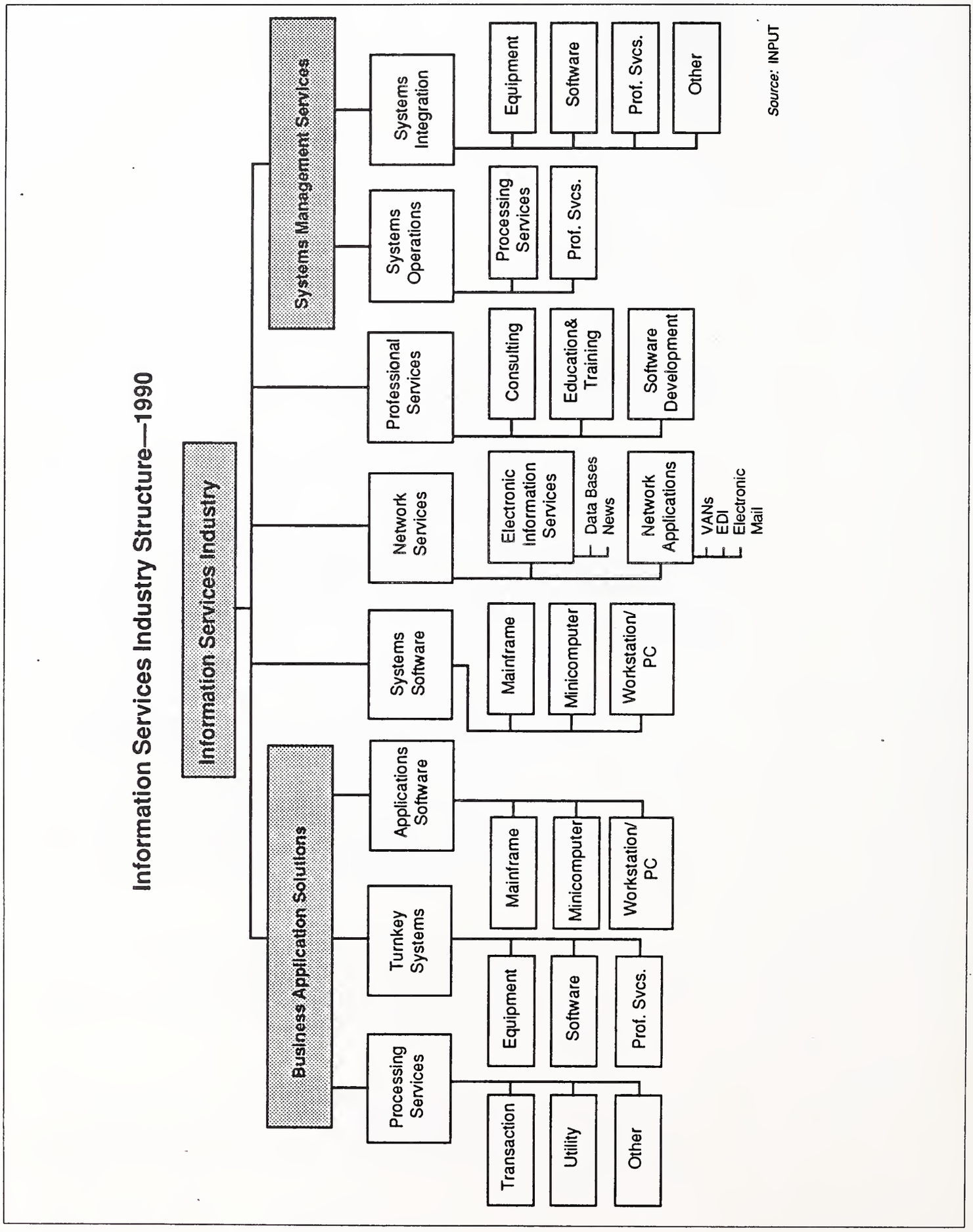
- *Transaction Processing Services* - Updates client-owned data files by entry of specific business activity, such as sales order, inventory receipt, cash disbursement, etc. Transactions may be entered in one of three modes.

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

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

© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT B-1



© 1990 by INPUT. Reproduction Prohibited.

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

  ° Access to a communications network.

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

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

  ° Significant software as part of the service.

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

"Other" Processing Services include:

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

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

Processing services are further differentiated as follows:

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

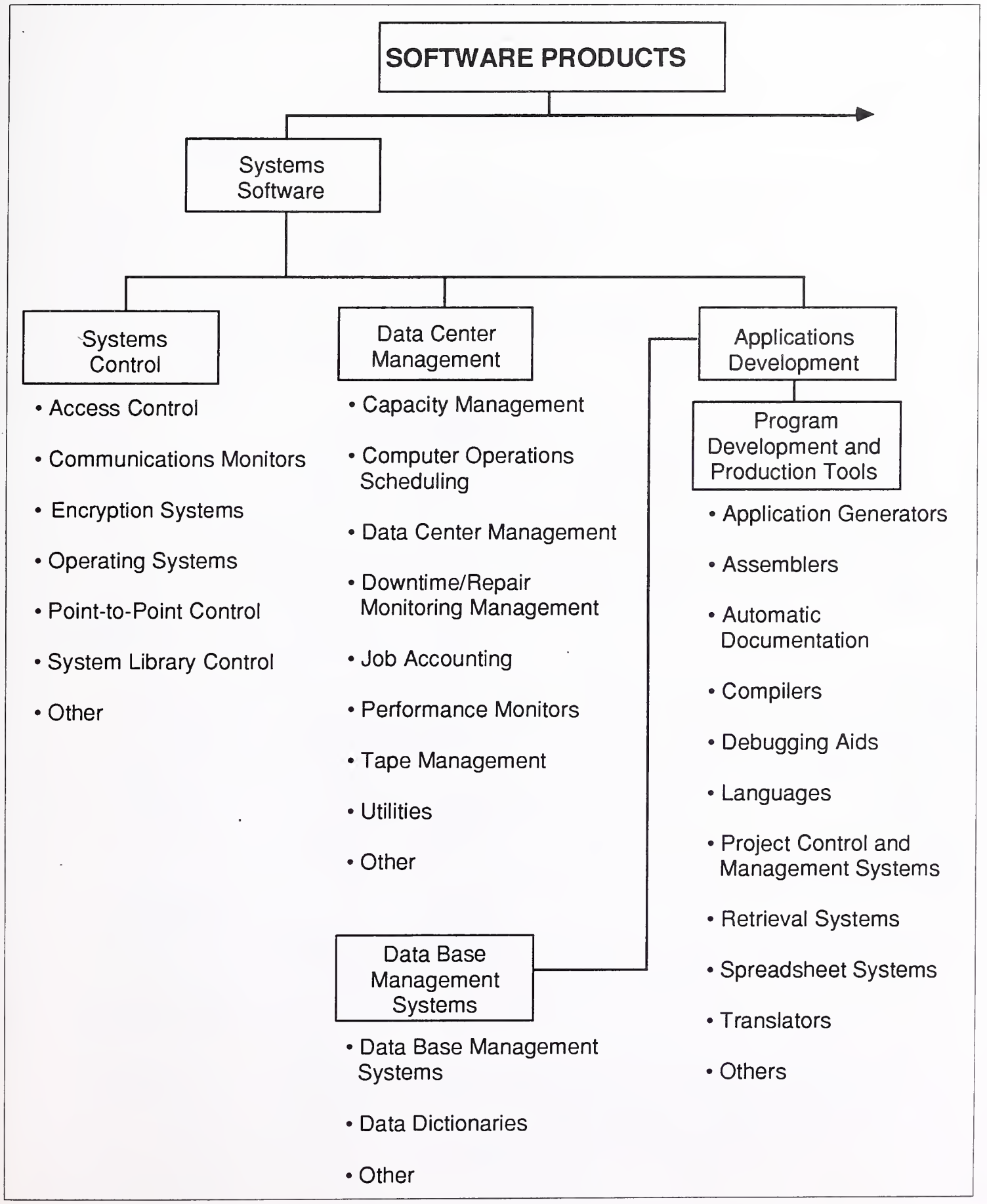
- *Value-Added Networks (VANs)* - VANs typically involve common carrier network transmission facilities that are augmented with computerized switches. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and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

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

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

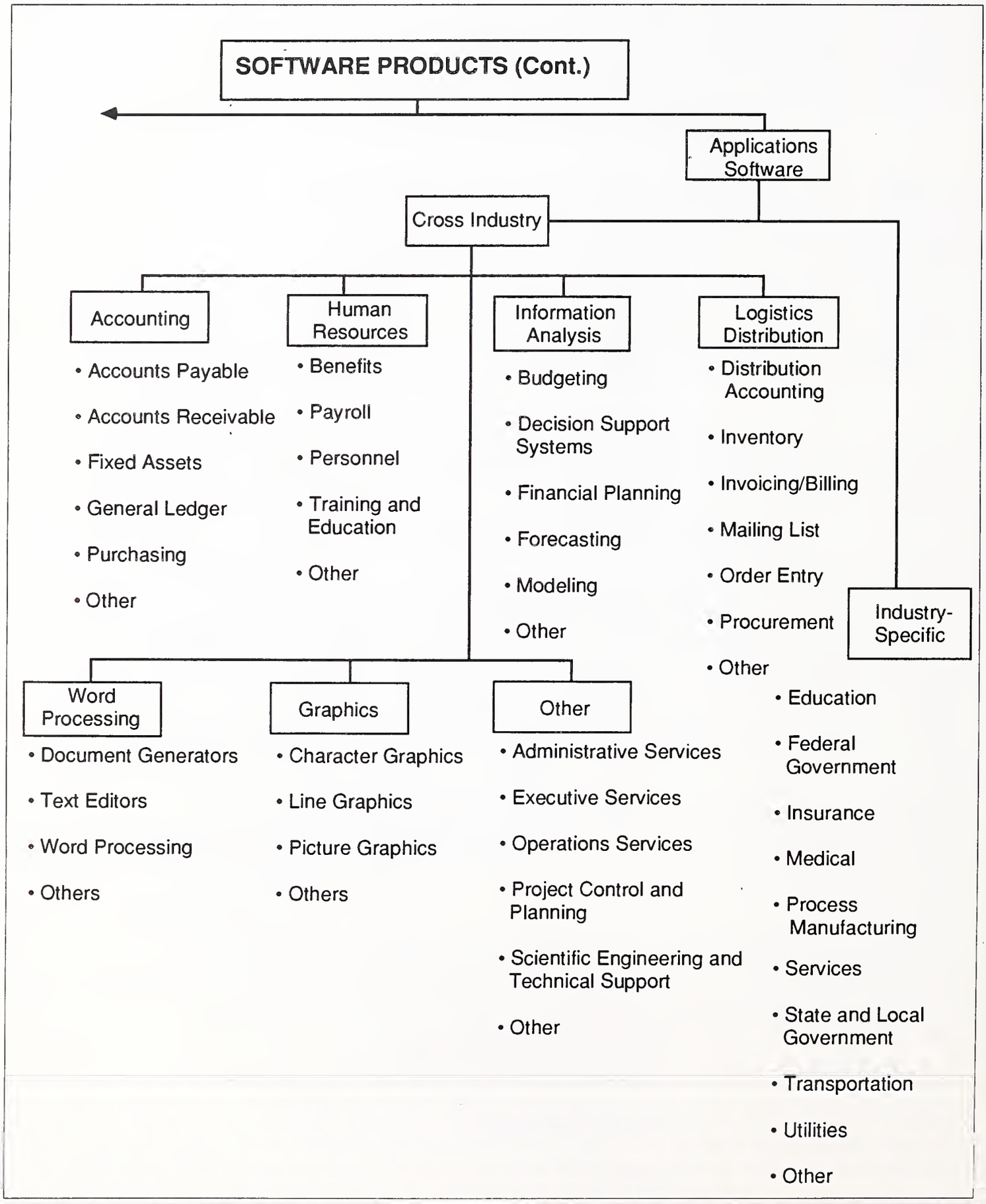
© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT B-2



© 1990 by INPUT. Reproduction Prohibited.

EXHIBIT B-2 (Cont.)



© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

- Turnkey systems revenue is divided into two categories.

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

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

- Revenue includes hardware, software, and support functions.

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

© 1990 by INPUT. Reproduction Prohibited.

B

Hardware/Hardware Systems

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

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

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

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

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

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

Terminals - Three types of terminals are described below:

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

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

- *User Nonprogrammable*

  - Single-station.
  - Multistation shared processor.
  - Teleprinter.

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

Hardware Systems - Includes all processors from microcomputers to supercomputers. Hardware systems may require type- or model-unique operating software to be functional, but this category excludes applica-

© 1990 by INPUT. Reproduction Prohibited.

tions software and peripheral devices, other than main memory and processors or CPUs not provided as part of an integrated (turnkey) system.

- *Microcomputer* - Combines all of the CPU, memory, and peripheral functions of an 8-, 16-, or 32-bit computer on a chip in the form of:
  - Integrated circuit package.
  - Plug-in boards with more memory and peripheral circuits.
  - Console including keyboard and interfacing connectors.
  - Personal computer with at least one external storage device directly addressable by the CPU.
  - An embedded computer which may take a number of shapes or configurations.

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

- *Midsize Computer* - Typically a 32- or 64-bit computer with extensive applications software and a number of peripherals in standalone or multiple-CPU configurations for business (administrative, personnel, and logistics) applications; also called a general purpose computer. All Intel 80386, Motorola 68000-based systems, and large multi-user systems are included. Specific systems in this category are: IBM 93XX systems, all Digital VAX series systems, and such common UNIX-based systems as from Apollo and Sun) are also included. Most large shared-logic, integrated office systems—such as those from Wang, Hewlett-Packard, and Groupe Bull—would also be considered midsize systems. Does not include microcomputers (standalone, or shared), embedded systems and CAD/CAM systems.

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

  ° Parallel processors.
  ° Pipeline processor.
  ° Vector processor.

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

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

C

Telecommunications

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

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

• *Mode* - may be either:

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

D

General Definitions

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

DECNET - Digital Equipment Company's network architecture.

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

EFT - Electronic funds transfer.

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

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

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

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

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

HDLC - High-level Data Link Control.

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

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

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

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

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

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

Interconnection - Physical linkage between devices on a network.

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

PPM - Pulse Position Modulation.

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

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

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

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

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

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

SDN - Software-Defined Network.

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

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

Simplex - Undirectional communications.

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

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

© 1990 by INPUT. Reproduction Prohibited.

Software - Computer programs.

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

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

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

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

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

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

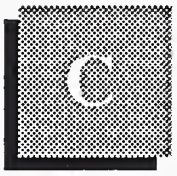
VTAM - Virtual Telecommunications Access Method - host-resident communications software for SNA networks.

E

Other Considerations

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

© 1990 by INPUT. Reproduction Prohibited.



Glossary of Acronyms

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

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

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

A

Federal Acronyms

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

© 1990 by INPUT. Reproduction Prohibited.

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

© 1990 by INPUT. Reproduction Prohibited.

CAS	Contract Administration Services or Cost Accounting Standards.
CASB	Cost Accounting Standards Board.
CASP	Computer-Assisted Search Planning.
CBD	Commerce Business Daily - U.S. Department of Commerce publication listing government contract opportunities and awards.
CBO	Congressional Budget Office.
CCEP	Commercial Comsec Endorsement Program.
CCDR	Contractor Cost Data Reporting.
CCN	Contract Change Notice.
CCPDS	Command Center Processing and Display Systems.
CCPO	Central Civilian Personnel Office.
CCTC	Command and Control Technical Center (JCS).
CDR	Critical Design Review.
CDRL	Contractor Data Requirement List.
CFE	Contractor-Furnished Equipment.
CFR	Code of Federal Regulations.
CICA	Competition in Contracting Act.
CIG	Computerized Interactive Graphics.
CIR	Cost Information Reports.
CM	Configuration Management.
CMI	Computer-Managed Instruction.
CNI	Communications, Navigation, and Identification.
CO	Contracting Office, Contract Offices, or Change Order.
COC	Certificate of Competency (administered by the Small Business Administration).
COCO	Contractor-Owned, Contractor-Operated.
CODSIA	Council of Defense and Space Industry Associations.
COMSTAT	Communications Satellite Corporation.
CONUS	CONtinental United States.
COP	Capability Objective Package.
COTR	Contracting Officer's Technical Representative.
CP	Communications Processor.
CPAF	Cost-Plus-Award-Fee Contract.
CPFF	Cost-Plus-Fixed-Fee Contract.
CPIF	Cost-Plus-Incentive-Fee Contract.
CPR	Cost Performance Reports.
CPSR	Contractor Procurement System Review.
CR	Cost Reimbursement (Cost Plus Contract).
CSA	Combat or Computer Systems Architecture.
C/SCSC	Cost/Schedule Control System Criteria (also called "C-Spec").
CWAS	Contractor Weighted Average Share in Cost Risk.
DAL	Data Accession List.
DAR	Defense Acquisition Regulations.
DARPA	Defense Advanced Research Projects Agency.
DAS	Data Acquisition System.
DBHS	Data Base Handling System.
DCA	Defense Communications Agency.

© 1990 by INPUT. Reproduction Prohibited.

DCAA	Defense Contract Audit Agency.
DCAS	Defense Contract Administration Services.
DCASR	DCAS Region.
DCC	Digital Control Computer.
DCP	Development Concept Paper (DoD).
DCS	Defense Communications System.
DCTN	Defense Commercial Telecommunications Network.
DDA	Dynamic Demand Assessment (Delta Modulation).
DDC	Defense Documentation Center.
DDL	Digital Data Link - A segment of a communications network used for data transmission in digital form.
DDN	Defense Data Network.
DDS	Dynamic Diagnostics System.
DECCO	DEfense Commercial Communications Office.
DECEO	DEfense Communications Engineering Office.
D&F	Determination and Findings - required documentation for approval of a negotiated procurement.
DIA	Defense Intelligence Agency.
DIF	Document Interchange Format, Navy-sponsored word processing standard.
DHHS	Department of Health and Human Services.
DIDS	Defense Integrated Data Systems.
DISC	Defense Industrial Supply Center.
DLA	Defense Logistics Agency.
DMA	Defense Mapping Agency.
DNA	Defense Nuclear Agency.
DO	Delivery Order.
DOA	Department of Agriculture (also USDA).
DOC	Department of Commerce.
DOE	Department of Energy.
DOI	Department of Interior.
DOJ	Department of Justice.
DOS	Department of State.
DOT	Department of Transportation.
DPA	Delegation of Procurement Authority (granted by GSA under FPRs).
DPC	Defense Procurement Circular.
DQ	Definite Quantity Contract.
DQ/PL	Definite Quantity Price List Contract.
DR	Deficiency Report.
DSCS	Defense Satellite Communication System.
DSN	Defense Switched Network.
DSP	Defense Support Program (WWMCCS).
DSS	Defense Supply Service.
DTC	Design-To-Cost.
ECP	Engineering Change Proposal.
ED	Department of Education.
EEO	Equal Employment Opportunity.
8(a) Set-Aside	Agency awards direct to Small Business Administration for direct placement with a socially/economically disadvantaged company.

© 1990 by INPUT. Reproduction Prohibited.

EMC	Electro-Magnetic Compatibility.
EMCS	Energy Monitoring and Control System.
EO	Executive Order - Order issued by the President.
EOQ	Economic Ordering Quantity.
EPA	Economic Price Adjustment.
EPA	Environmental Protection Agency.
EPMR	Estimated Peak Monthly Requirement.
EPS	Emergency Procurement Service (GSA) or Emergency Power System.
EUC	End User Computing, especially in DoD.
FA	Formal Advertising.
FAC	Facility Contract.
FAR	Federal Acquisition Regulations.
FCA	Functional Configuration Audit.
FCC	Federal Communications Commission.
FCDC	Federal Contract Data Center.
FCRC	Federal Contract Research Center.
FDPC	Federal Data Processing Center.
FEDSIM	Federal (Computer) Simulation Center (GSA).
FEMA	Federal Emergency Management Agency.
FFP	Firm Fixed-Price Contract (also Lump Sum Contract).
FIPS	NBS Federal Information Processing Standard.
FIPS PUBS	FIPS Publications.
FIRMR	Federal Information Resource Management Regulations.
FMS	Foreign Military Sales.
FOC	Final Operating Capability.
FOIA	Freedom of Information Act.
FP	Fixed-Price Contract.
FP-L/H	Fixed-Price - Labor/Hour Contract.
FP-LOE	Fixed-Price - Level-Of-Effort Contract.
FPMR	Federal Property Management Regulations.
FPR	Federal Procurement Regulations.
FSC	Federal Supply Classification.
FSG	Federal Supply Group.
FSN	Federal Supply Number.
FSS	Federal Supply Schedule or Federal Supply Service (GSA).
FSTS	Federal Secure Telecommunications System.
FT Fund	A revolving fund, designated as the Federal Telecommunications Fund, used by GSA to pay for GSA-provided common-user services, specifically including the current FTS and proposed FTS 2000 services.
FTSP	Federal Telecommunications Standards Program administered by NCS; Standards are published by GSA.
FTS	Federal Telecommunications System.
FTS 2000	Proposed replacement for the Federal Telecommunications System.
FY	Fiscal Year.
FYDP	Five-Year Defense Plan.
GAO	General Accounting Office.
GFE	Government-Furnished Equipment.

© 1990 by INPUT. Reproduction Prohibited.

GFM	Government-Furnished Material.
GFY	Government Fiscal Year (October to September).
GIDEP	Government-Industry Data Exchange Program.
GOCO	Government Owned - Contractor Operated.
GOGO	Government Owned - Government Operated.
GOSIP	Government Open Systems Interconnection Profile.
GPO	Government Printing Office.
GPS	Global Positioning System.
GRH	Gramm-Rudman-Hollings Act (1985), also called Gramm-Rudman Deficit Control.
GS	General Schedule.
GSA	General Services Administration.
GSBCA	General Services Administration Board of Contract Appeals.
HCFA	Health Care Financing Administration.
HHS	(Department of) Health and Human Services.
HPA	Head of Procuring Activity.
HSDP	High-Speed Data Processors.
HUD	(Department of) Housing and Urban Development.
ICA	Independent Cost Analysis.
ICAM	Integrated Computer-Aided Manufacturing.
ICE	Independent Cost Estimate.
ICP	Inventory Control Point.
ICST	Institute for Computer Sciences and Technology, National Bureau of Standards, Department of Commerce.
IDAMS	Image Display And Manipulation System.
IDEP	Interservice Data Exchange Program.
IDN	Integrated Data Network.
IFB	Invitation For Bids.
IOC	Initial Operating Capability.
IOI	Internal Operating Instructions.
IPS	Integrated Procurement System.
IQ	Indefinite Quantity Contract.
IR&D	Independent Research & Development.
IRM	Information Resources Management.
IXS	Information Exchange System.
JFMIP	Joint Financial Management Improvement Program.
JOCIT	Jovial Compiler Implementation Tool.
JSIPS	Joint Systems Integration Planning Staff.
JSOP	Joint Strategic Objectives Plan.
JSOR	Joint Service Operational Requirement.
JUMPS	Joint Uniform Military Pay System.
LC	Letter Contract.
LCC	Life Cycle Costing.
LCMP	Life Cycle Management Procedures (DD7920.1).

© 1990 by INPUT. Reproduction Prohibited.

LCMS	Life Cycle Management System.
L-H	Labor-Hour Contract.
LOI	Letter of Interest.
LRPE	Long-Range Procurement Estimate.
LRIRP	Long-Range Information Resource Plan.
MAISRC	Major Automated Information Systems Review Council (DoD).
MANTECH	MANufacturing TECHnology.
MAPS	Multiple Address Processing System.
MAP/TOP	Manufacturing Automation Protocol/Technical and Office Protocol.
MASC	Multiple Award Schedule Contract.
MDA	Multiplexed Data Accumulator.
MENS	Mission Element Need Statement or Mission Essential Need Statement (see DD-5000.1 Major Systems Acquisition).
MILSCAP	Military Standard Contract Administration Procedures.
MIL SPEC	Military Specification.
MIL STD	Military Standard.
MIPR	Military Interdepartmental Purchase Request.
MOD	Modification.
MOL	Maximum Ordering Limit (Federal Supply Service).
MPC	Military Procurement Code.
MYP	Multi-Year Procurement.
NARDIC	Navy Research and Development Information Center.
NASA	National Aeronautics and Space Administration.
NBS	National Bureau of Standards.
NCMA	National Contract Management Association.
NCS	National Communications System; responsible for setting U.S. Government standards administered by GSA; also holds primary responsibility for emergency communications planning.
NICRAD	Navy-Industry Cooperative Research and Development.
NIP	Notice of Intent to Purchase.
NMCS	National Military Command System.
NSA	National Security Agency.
NSEP	National Security and Emergency Preparedness.
NSF	National Science Foundation.
NSIA	National Security Industrial Association.
NTIA	National Telecommunications and Information Administration of the Department of Commerce; replaced the Office of Telecommunications Policy in 1970 as planner and coordinator for government communications programs; primarily responsible for radio.
NTIS	National Technical Information Service.
Obligation	"Earmarking" of specific funding for a contract from committed agency funds.
OCS	Office of Contract Settlement.
OFCC	Office of Federal Contract Compliance.
Off-Site	Services to be provided near but not in government facilities.
OFMP	Office of Federal Management Policy (GSA).

© 1990 by INPUT. Reproduction Prohibited.

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

© 1990 by INPUT. Reproduction Prohibited.

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

© 1990 by INPUT. Reproduction Prohibited.

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

© 1990 by INPUT. Reproduction Prohibited.

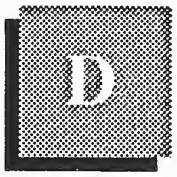
B

General and Industry Acronyms

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

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Policies, Regulations, and Standards

A

OMB Circulars

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

B

GSA Publications

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

C

DoD Directives

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

© 1990 by INPUT. Reproduction Prohibited.

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

D

Standards

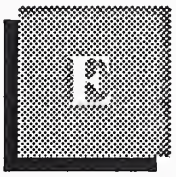
	ADCCP	Advanced Data Communications Control Procedures; ANSI Standard X3.66 of 1979; also NBS FIPS 71.
	CCITT G.711	International PCM standard.
	CCITT T.0	International standard for classification of facsimile apparatus for document transmission over telephone-type circuits.
	DEA-1	Proposed ISO standard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

© 1990 by INPUT. Reproduction Prohibited.

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

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Related INPUT Reports

A

Annual Market Analyses

U.S. Information Services Vertical Markets, 1989

U.S. Information Services Cross-Industry Markets, 1989

Procurement Analysis Reports, GFY 1990-1995

B

Industry Surveys

U.S. Information Services Industry, 1989

Nineteenth Annual ADAPSO Survey of the Computer Services Industry

Directory of Leading U.S. Information Service Vendors, 1989

C

Market Reports

Federal Financial Systems Market, 1990-1995

Federal Computer Security Market, 1990-1995

U.S. EDI Federal Markets, 1989-1994

Defense Logistics Agency Information Services Market

Federal Software and Related Services, 1989-1994

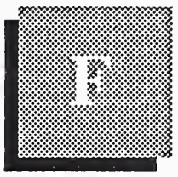
Federal Systems Integration Market, 1990-1995

Federal Processing Services/Systems Operations Market, 1989-1994

Federal Telecommunications Market, 1990-1995

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



Questionnaires

Although the period of interest for the 1989 update to this report covers GFY 1989-1994, data that is still timely has been incorporated from earlier versions released in 1987 and 1988. All questionnaire survey vehicles that were used to generate exhibit material for this report are included in this appendix. The questionnaire structures and definitions used in the earlier studies have been annotated for consistency with INPUT's current categories of professional services products and services.

A
1990 Case Study Questionnaires

1. Definitions

For the purposes of this study INPUT defined Professional Services to encompass the following categories of vendor-supplied consulting, education and training, software development, and systems operations functions:

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

- *Systems Operations (Professional Services)*—Operation of government-owned computer equipment (frequently referred to as facilities management or GOCO). The vendor provides the staff to operate, maintain, and, in some contracts, manage the client's ADP facility.

© 1990 by INPUT. Reproduction Prohibited.

2. Federal Professional Services Case Study—Agency Questionnaire, 1990-1995

Program Name: _____
Department: _____
Branch/Office: _____
Agency: _____

1. Please describe the mission problem/function that this professional services contract was to solve/fulfill? (Example: The agency's existing budget data base ran on equipment that was approximately 15 years old performing only batch applications. The agency had purchased new hardware and now needed to convert existing applications to run in an interactive mode under a new operating system.) ***(specify mission):***

   _____
   _____
   _____
   _____

2. What major tasks did the contracted professional services vendor perform that were critical to the program's success? (Example: Designed new interactive budget data base; converted code from existing applications to run against new data base; conducted training classes for agency MIS personnel; and developed new systems documentation.)
   (specify tasks):

   _____
   _____
   _____
   _____

3. Please ***specify*** the following summary contract and schedule information for this contract:
   a. Contract type: _____
   b. Contract value: $_____
   c. Contract duration: _____
   d. RFP release date: _____
   e. Bid due date: _____
   f. Contract award date: _____
   g. Project completion date: _____

4. For this professional services contract, please ***provide*** the names of all contractors and functions they were responsible for:

Contractor	Company	Functions
Prime contractor	_____	_____
Subcontractor	_____	_____
Subcontractor	_____	_____
Outside consultant	_____	_____

© 1990 by INPUT. Reproduction Prohibited.

5. For each professional service listed, indicate contractor responsibility for this contract only: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for service not applicable to this contract)***

Professional Services	Circle All that Apply			
Consulting services	P	S	O	N
Software development	P	S	O	N
Systems operations	P	S	O	N
Education/Training	P	S	O	N

CONSULTING SERVICES

6a. For each type of consulting service listed below, please indicate contractor responsibility in this professional services contract: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)***

Consulting Services	Circle All that Apply			
Systems management consulting	P	S	O	N
Services management consulting	P	S	O	N
Technical project assistance	P	S	O	N
Management project assistance	P	S	O	N
Feasibility analysis	P	S	O	N
Cost-effectiveness trade-off studies	P	S	O	N

6b. Enter the total $ value of the consulting services portion of this contract:
$_____ ***(enter value)***

SOFTWARE DEVELOPMENT

7a. Specify the types of applications that were developed or modified for this project; also indicate contractor responsibility for each application: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)***

Specify Software Type	Circle All that Apply			
_____	P	S	O	N
_____	P	S	O	N
_____	P	S	O	N
_____	P	S	O	N

7b. Enter the total $ value of the software development portion of this contract:
$_____ ***(enter value)***

© 1990 by INPUT. Reproduction Prohibited.

7c. For each software development service listed below, please indicate contractor responsibility in this professional services contract: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)***

Software Development Services	**Circle All that Apply**			
User requirements definition	P	S	O	N
Systems design	P	S	O	N
Contract programming	P	S	O	N
Software documentation	P	S	O	N
Other *(specify)*:_____	P	S	O	N

SYSTEMS OPERATIONS (GOCO)

8a. Please circle which types of contractors had responsibility for systems operations for this professional services contract: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)***
(circle all that apply) P S O N

8b. Estimate the total $ value of the systems operations portion of this contract:
$_____ ***(enter value)***

8c. Enter the total number of staff personnel provided by all contractors to manage the client's facility:
_____ ***(enter number)***

EDUCATION AND TRAINING

9a. Please estimate the total $ value of the education/training portion of this contract:
$_____ ***(enter value)***

9b. Circle which types of contractors had responsibility for education/training services for this contract:
(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)
(circle all that apply) P S O N

9c. Please *indicate* what types of education/training services were provided as part of this contract:

Education/Training Services	**Check All that Apply**
Computer-Aided Instruction (CAI)	❑
Computer-Based Education (CBE)	❑
Vendor Instruction of User Personnel in Operations	❑
Vendor Instruction of User Personnel in Programming	❑
Vendor Instruction of User Personnel for Maintenance	❑
Other Documentation Services	❑

Other *(specify)*: _____
_____
_____

© 1990 by INPUT. Reproduction Prohibited.

10a. *Indicate* any additional services that were provided through this professional services contract, and also please indicate contractor responsibility: ***(circle P for Prime Contractor; S for Subcontractor; and O for Other):***

Specify Additional Services	**Circle All that Apply**		
_____	P	S	O
_____	P	S	O
_____	P	S	O

10b. Estimate the $ value of any additional services provided by the contractors of this professional services contract:
$ _____ ***(enter value)***

11. How would you rate your agency's overall satisfaction with the results of this professional services contract?
(use a 1-5 scale: where 5=extremely satisfied; and 1=not satisfied at all)
(circle one) 1 2 3 4 5
Additional comments:
_____
_____
_____

12. What funding was originally appropriated for this contract?
$ _____ ***(specify amount)***

13a. Did the scope of this project change from the contract award date? ***(check one)***
Yes ❑ No ❑ ***(go to Question 14)***

13b. ***If Yes,*** how was this issue resolved with the contractor?
(Please explain)
_____
_____
_____

14. Please ***detail*** the current status of this professional services contract:
_____
_____
_____

GENERAL PROFESSIONAL SERVICES QUESTIONS

15a. In your opinion, has changing technology impacted vendor performance in professional services contracts?
(check one)
Yes ❑
No ❑
No Opinion ❑ ***(go to Question 16a)***

15b. Please ***explain*** why or why not:
_____
_____
_____

© 1990 by INPUT. Reproduction Prohibited.

16a. Systems engineering and technical assistance (SETA) contracting is often used to acquire professional services. Do you think this is the best contracting approach agencies should use in acquiring professional services from vendors? ***(check one)***

Yes ❑
No ❑
No Opinion ❑ ***(go to Question 17)***

16b. Why?

_____
_____

17. What types of applications are normally contracted by your agency or organization to a professional services vendor?

_____
_____
_____

18a. In your opinion, what characteristics have prevailed in poorly performed professional services contracts? ***(Please explain)***

_____
_____
_____

18b. What characteristics contribute to a satisfactorily performed professional services contract? ***(Please explain)***

_____
_____
_____

© 1990 by INPUT. Reproduction Prohibited.

3. Federal Professional Services Case Study—Contractor Questionnaire, 1990-1995

Program Name: _____
Department: _____
Branch/Office: _____
Agency: _____

1. Please describe the mission problem/function that this professional services contract was to solve/fulfill? (Example: The agency's existing budget data base ran on equipment that was approximately 15 years old performing only batch applications. The agency had purchased new hardware and now needed to convert existing applications to run in an interactive mode under a new operating system.) ***(specify mission):***

   _____
   _____
   _____
   _____

2. What major tasks did the contracted professional services vendor perform that were critical to the program's success? (Example: Designed new interactive budget data base; converted code from existing applications to run against new data base; conducted training classes for agency MIS personnel; and developed new systems documentation.) ***(specify tasks):***

   _____
   _____
   _____
   _____

3. Please ***specify*** the following summary contract and schedule information for this contract:
   a. Contract type: _____
   b. Contract value: $ _____
   c. Contract duration: _____
   d. RFP release date: _____
   e. Bid due date: _____
   f. Contract award date: _____
   g. Project completion date: _____

4. For this professional services contract, please ***provide*** the names of all contractors and functions they were responsible for:

Contractor	Company	Function
Prime contractor	_____	_____
Subcontractor	_____	_____
Subcontractor	_____	_____
Outside consultant	_____	_____

© 1990 by INPUT. Reproduction Prohibited.

5. For each professional service listed, indicate contractor responsibility for this contract only: *(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for service not applicable to this contract)*

Professional Services	**Circle All that Apply**			
Consulting services	P	S	O	N
Software development	P	S	O	N
Systems operations	P	S	O	N
Education/Training	P	S	O	N

CONSULTING SERVICES

6a. For each type of consulting service listed below, please indicate contractor responsibility in this professional services contract: *(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)*

Consulting Services	**Circle All that Apply**			
Systems management consulting	P	S	O	N
Services management consulting	P	S	O	N
Technical project assistance	P	S	O	N
Management project assistance	P	S	O	N
Feasibility analysis	P	S	O	N
Cost-effectiveness trade-off studies	P	S	O	N

6b. Enter the total $ value of the consulting services portion of this contract: $ _____ *(enter value)*

SOFTWARE DEVELOPMENT

7a. Specify the types of applications that were developed or modified for this project; also indicate contractor responsibility for each application: *(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)*

Specify Software Type	**Circle All that Apply**			
_____	P	S	O	N
_____	P	S	O	N
_____	P	S	O	N
_____	P	S	O	N

7b. Enter the total $ value of the software development portion of this contract:
$ _____ *(enter value)*

7c. For each software development service listed below, please indicate contractor responsibility in this professional services contract: *(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)*

Software Development Services	**Circle All that Apply**			
User requirements definition	P	S	O	N
Systems design	P	S	O	N
Contract programming	P	S	O	N
Software documentation	P	S	O	N
Other *(specify)*:_____	P	S	O	N

© 1990 by INPUT. Reproduction Prohibited.

SYSTEMS OPERATIONS (GOCO)

8a. Please circle which types of contractors had responsibility for systems operations for this professional services contract: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)***
(circle all that apply) P S O N

8b. Please estimate the total $ value of the systems operations portion of this contract:
$_____ ***(enter value)***

8c. Enter the total number of staff personnel provided by all contractors to manage the clients facility:
_____ ***(enter number)***

EDUCATION AND TRAINING

9a. Estimate the total $ value of the education/training portion of this contract:
$_____ ***(enter value)***

9b. Circle which types of contractors had responsibility for education/training services for this contract: ***(circle P for Prime Contractor; S for Subcontractor; O for Other; and N for not applicable to this contract)***
(circle all that apply) P S O N

9c. Please indicate what types of education/training services were provided as part of this contract:

Education/Training Services	**Check All that Apply**
Computer-Aided Instruction (CAI)	❑
Computer-Based Education (CBE)	❑
Vendor Instruction of User Personnel in Operations	❑
Vendor Instruction of User Personnel in Programming	❑
Vendor Instruction of User Personnel for Maintenance	❑
Other Documentation Services	❑

Other ***(specify)***: _____
_____
_____

10a. Please indicate any additional services that were provided through this professional services contract, and also please indicate contractor responsibility: ***(circle P for Prime Contractor; S for Subcontractor; and O for Other):***

Specify Additional Services	**Check All that Apply**		
_____	P	S	O
_____	P	S	O
_____	P	S	O

10b. Estimate the $ value of any additional services provided by the contractors of this professional services contract:
$ _____ ***(enter value)***

© 1990 by INPUT. Reproduction Prohibited.

11. How would you rate the agency's overall satisfaction with the results of this professional services contract?
(use a 1-5 scale: where 5=extremely satisfied; and 1=not satisfied at all)
(circle one) 1 2 3 4 5
Additional comments: _____

12. What funding was originally appropriated for this contract?
$ _____ *(specify amount)*

13a. Did the scope of this project change from the contract award date? *(check one)*
Yes ❑ No ❑ *(go to Question 14)*

13b. ***If Yes,*** how was this issue resolved with the agency? *(Please explain)*

14. Please ***detail*** the current status of this professional services contract:

GENERAL PROFESSIONAL SERVICES QUESTIONS

15a. In your opinion, has changing technology impacted vendor performance in professional services contracts? *(check one)*
Yes ❑ No ❑ No Opinion ❑ *(go to Question 16a)*

15b. Please ***explain*** why or why not:

16a. Systems engineering and technical assistance (SETA) contracting is often used to acquire professional services. Do you think this is the best contracting approach agencies should use in acquiring professional services from vendors? *(check one)*
Yes ❑ No ❑ No opinion ❑ *(go to Question 17)*

16b. Why?

17. What types of applications do agencies normally contract to a professional services contractor?

© 1990 by INPUT. Reproduction Prohibited.

18a. In your opinion, what characteristics have prevailed in poorly performed professional services contracts? ***(Please explain)***

_____

_____

_____

18b. What characteristics contribute to a satisfactorily performed professional services contract? ***(Please explain)***

_____

_____

_____

B

1988 Questionnaires

1. Definitions

For the purposes of this study, INPUT defined Professional Services to include the following categories of contractor products and services:

- *Consulting Services*—Includes information systems and/or services management consulting, program assistance (technical and/or management), feasibility analysis, and cost-effective trade-off studies.

- *Education and Training*—Services related to information systems and services for the users, including CAI (computer-aided instruction), CBE (computer-based education), and vendor instruction of user personnel in operations, programming, and software maintenance. Common government education and training services that are contracted to vendors include: training programs, books and manuals, seminars, and automated training systems.

- *Programming and Analysis*—Also called software development services, includes: system design, contract or custom programming, code conversion, independent verification and validation, benchmarking, and software maintenance.

- *Systems Operations*—also called Facilities Management/Operations and Maintenance—operation of government owned computer equipment (GOCO-Government-Owned/Contractor-Operated). The vendor provides the staff to operate, maintain, and, in some contracts, manage the client's ADP facility.

© 1990 by INPUT. Reproduction Prohibited.

2. Federal Professional Services Market—Agency Questionnaire, 1988-1993

QU: 1 What federal procurement trends does your agency foresee affecting its need/use for professional services contractors?

_____

_____

_____

QU: 2 What specific procurement regulations impact the use of professional services contractors?

_____

_____

_____

QU: 3 What suggestions do you have for vendors who team with other vendors on professional services bids in the federal market?

_____

_____

QU: 4 What impact has federal personnel policies had on how your agency meets its information technology requirements?

_____

_____

QU: 5 Which economic and regulatory factors will impact federal information technology requirements for professional services over the next few years?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 6 Do you believe agencies will use more multiple award BOAs to acquire professional services during the next few years and why?

_____

_____

QU: 7 In rank order, please specify the most important bid selection criteria that agencies should use in evaluating contractors' proposals to provide professional services? **(indicate the most important criterion, first; the next important criterion, second; etc.)**

Specify Criteria

_____ (rank 1)

_____ (rank 2)

_____ (rank 3)

_____ (rank 4)

QU: 8 Which contract type does your agency prefer to use to acquire professional services and why?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

3. Federal Professional Services Market—Industry Questionnaire, 1988-1993

QU: 1a Does your company now provide or plan to provide professional services to the federal government?

Yes____ No____

QU: 1b What types of systems or services do you now provide or plan to provide?

	Current		Future		
	Yes	No	Yes	No	Why?
Consulting Services	____	____	____	____	_____
Education/Training	____	____	____	____	_____
Software Development	____	____	____	____	_____
Systems Operations	____	____	____	____	_____

QU: 1c What other categories, if any, of professional services would you add to our list?

_____

_____

QU: 1d What are your current and future activities in those categories?

_____

_____

QU: 2 What percent of your total professional services business was done with the federal government last year?

_____

QU: 3a What percent of your federal professional services revenue was generated in each of the following categories last year?

	Percent Revenue Last Year
Consulting Services	_____
Education/Training	_____
Software Development	_____
Systems Operations	_____
Other	_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 3b What was your company's total professional services revenue in dollars last fiscal year - both commercial and government?

_____

QU: 3c According to your company's total professional services revenue, do you rank your company within the top 10 professional services vendors serving the federal market?

Yes____ No____

QU: 3d What is your approximate rank? _____

QU: 3e What was your company's total corporate revenue in dollars for your most recent fiscal year? $ _____ FY _____

QU: 4a Do you anticipate any change in the amount of professional services you will provide to the federal government in the next two to five years?
Yes____ No____

QU: 4b (If Yes) In which of the following categories do you expect either an increase or decrease in the next two to five years, and can you estimate by what percent? This is federal government only.

	Increase	Decrease	No Change	Percent Change
Consulting Services	_____	_____	_____	_____
Education/Training	_____	_____	_____	_____
Software Development	_____	_____	_____	_____
Systems Operations	_____	_____	_____	_____

QU: 5 In your opinion, what technical factors will increase or decrease federal government spending on professional services in the next two to five years?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 6a In your opinion, which agencies provide the most attractive opportunities for your company in providing professional services to the government?

_____

_____

QU: 6b Do you provide professional services to any of these agencies under Multiple Award Basic Ordering agreements?

_____

Which Agencies? _____

QU: 7 Are you now qualified or do you plan to become qualified in Ada programming?
Qualified Now____ Planning To Be____

QU: 8 What differences do you see between commercial markets and the federal market for your products and services?

_____

_____

QU: 9 What industry trends will affect the federal professional services market?

_____

_____

Why? _____

_____

QU: 10 Do you expect the government to increase its SETA contracting over the next five years?

_____

_____

Why? _____

_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 11 Which of the following contract types do you expect to dominate the federal professional services market over the next five years?

Cost Plus____ Fixed Price____ Mix of Both____

Other (specify): _____

Why? _____

_____

QU: 12 What are the implications of these contracting trends on professional services vendors, particularly as it relates to pricing approaches?

_____

_____

QU: 13 What effect will the government's growing use of packaged software have on the professional services market?

_____

_____

QU: 14 When you complete a professional services contract with the government for design, programming and analysis, is follow-on support usually transferred in-house or left with you or another vendor?

In-House ____
Out-of-House Self ____
Out-of-House Other ____

QU: 15a Have you ever lost any professional services contracts to government in-house staffs?

Yes ____ No____

QU: 15b Why?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 15c What types of applications?

_____

_____

QU: 16 Have you ever acquired a contract for support functions that were previously done in-house by the government?

Yes ____ No____

QU: 17 Could you identify those non-technical factors that would have the greatest impact on government professional services acquisitions?

_____

_____

QU: 18 How would you rate the importance of the following professional services vendor characteristics in winning a bid?

1 - Definitely not important
2 - Somewhat important
3 - Important
4 - Very important
5 - Crucial

Characteristics	Rate				
1. Application Functional Experience	1	2	3	4	5
2. Staff Experience	1	2	3	4	5
3. Software Development Experience	1	2	3	4	5
4. Support Functions	1	2	3	4	5
5. Federal Contract Experience	1	2	3	4	5
6. Agency Experience	1	2	3	4	5
7. Price	1	2	3	4	5
8. Other	1	2	3	4	5

© 1990 by INPUT. Reproduction Prohibited.

QU: 19 On a scale of 1 to 5, with 5 being the most satisfied, how would you rate the government's level of satisfaction with professional services vendors in the past regarding:

Characteristics	Rate				
a. Quality of Work	1	2	3	4	5
b. Quantity of Work	1	2	3	4	5
c. Responsiveness to Agency Needs	1	2	3	4	5
d. Project Management	1	2	3	4	5
e. Development Visibility	1	2	3	4	5
f. Delivery Schedule(s)	1	2	3	4	5
g. Cost	1	2	3	4	5

QU: 20 What do you believe vendors need to do over the next five years to make their products and professional services more valuable to the federal government?

_____

_____

Additional Comments:

_____

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

C

1987 Questionnaires

1. Definitions

For the purposes of this survey, INPUT defined "Professional Services" - "for ADP" as follows:

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

- *Systems Operations*—(Also referred to as O&M)—Contractor (vendor) - staffed support of client ADP/telecommunications equipment on-site (on government property), in cases where the vendor does not manage the complete facility. The equipment and initial software suite may not have been provided by the vendor.

- *Software Development*—Includes systems design, (contract or custom programming, code conversion, independent verification and validation (also called "IV&V"), benchmarking, and software maintenance.

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

© 1990 by INPUT. Reproduction Prohibited.

2. Federal Professional Services—Agency Questionnaire, 1987-1992

QU: 1 Have you used any of the following professional services categories within the past year? Proposed future use?

	Current		Future		
	Yes	No	Yes	No	Why?
Consulting Services	____	____	____	____	_____
Education/Training	____	____	____	____	_____
Software Development	____	____	____	____	_____
Systems Operations	____	____	____	____	_____

QU: 2 What percent of your total professional services budget is currently spent on each of the following categories?

	Percent Spent Now
Consulting Services	_____
Education/Training	_____
Software Development	_____
Systems Operations	_____
Other	_____
Total	_____

QU: 3 What is your annual expenditure for professional services?

_____

QU: 4a Do you anticipate any change in the amount of professional services you will use in the next two to five years?

Yes ____ No____
(If Yes, proceed to question 4b) (If no, proceed to question 5a)

QU: 4b In which of the following categories do you expect either an increase or decrease in the next two to five years, and can you estimate by what percent?

	Increase	Decrease	No Change	Percent Change
Consulting Services	_____	_____	_____	_____
Education/Training	_____	_____	_____	_____
Software Development	_____	_____	_____	_____
Systems Operations	_____	_____	_____	_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 5a What types of applications have been contracted out to professional services vendors in the past year?

_____

_____

QU: 5b What additional applications do you foresee in the next five years?

_____

_____

QU: 6a In your opinion, is your agency going to continue to utilize custom software in its computer operations? (software development).

Yes ____ No____

QU: 6b How many of these applications are equivalent to commercial software applications and could be accomplished by minor modifications to a commercial software package?

_____

QU: 6c How many custom software applications are unique to the government agency only and do not have a commercial equivalent available for use?

_____

QU: 6d Is your agency using or planning to use commercial or customized Data Base Management Systems (DBMS)?

Yes ____ No____

For what types of applications? _____

© 1990 by INPUT. Reproduction Prohibited.

QU: 7 Which computer language standards are in effect now or might be applied in the future to your agency's use of professional services?
(Instructions: For each standard, give which professional services it is used for and whether it is used currently or will be in the future.)

Language Standard	Professional Services Applications Use	Current Use	Future Use
1.			
2.			
3.			

QU: 8a What types of education and training requirements does your agency have?

_____

_____

QU: 8b Have they increased or decreased over the last five years?

Increase____ Decrease____

QU: 8c Will they increase _____, decrease _____, or stay about the same _____ over the next five years?

QU: 8d Where will the funding be obtained or diverted to for supporting these educational requirements?

_____

QU: 9 How would you rate the importance of the following professional services vendor characteristics in winning a bid?
1 - Definitely not important
2 - Somewhat important
3 - Important
4 - Very important
5 - Crucial

© 1990 by INPUT. Reproduction Prohibited.

QU: 9 (con't) **Characteristics** **Rank**

1.	Application Functional Experience	1	2	3	4	5
2.	Staff Experience	1	2	3	4	5
3.	Software Development Experience	1	2	3	4	5
4.	Support Functions	1	2	3	4	5
5.	Federal Contract Experience	1	2	3	4	5
6.	Agency Experience	1	2	3	4	5
7.	Price	1	2	3	4	5
8.	Other	1	2	3	4	5

QU: 10 On a scale of 1 to 5, with 5 being the most satisfied, how would you rate your level of satisfaction with professional services vendors in the past regarding:

	Characteristics	Rank				
a.	Quality of Work	1	2	3	4	5
b.	Quantity of Work	1	2	3	4	5
c.	Responsiveness to Agency Needs	1	2	3	4	5
d.	Project Management	1	2	3	4	5
e.	Development Visibility	1	2	3	4	5
f.	Delivery Schedule(s)	1	2	3	4	5
g.	Cost	1	2	3	4	5

QU: 11a What type of contract does your agency prefer for professional services?

Cost Plus____ Fixed Price____ Mix of Both____

Other (specify): _____

QU: 11b Are you presently using Multiple Award Basic Ordering Agreements? _____

Which Services? _____

QU: 12 When a professional services contract for design, programming and analysis is completed, do you usually transfer continued support in-house or leave support with the contractor?

In-House____ Out of House____

QU: 13a Do you plan to convert any professional services contracts to in-house?

Yes____ No____

© 1990 by INPUT. Reproduction Prohibited.

QU: 13b Why? _____

QU: 14a Do you plan to convert any in-house support functions to outside contractor support?

Yes____ No____

QU: 14b Why? _____

QU: 14c Which applications? _____

_____

QU: 15a Could you identify those factors (non-technical) that would have the greatest impact on your agency's professional services plans?

_____

_____

QU: 15b Have any federal personnel policies regarding ADP staff had an influence on your use of professional services?

_____

_____

QU: 16 What technological changes might alter the way your agency accomplishes its professional services plans?

_____

_____

QU: 17 What would you like to see vendors do in the next two to five years to make their services more valuable?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 18a Which type of vendor or organization appears more desirable for performing professional services?

Mainframe Manufacturer ____
Professional Services Company ____
Not-for-Profit ____
Software Products Vendor ____
Other (specify): _____

QU: 18b Why? _____

_____

QU: 19 How have vendor "teaming" arrangements served to satisfy the federal agency needs for professional services?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

3. Federal Professional Services—Industry Questionnaire, 1987-1992

QU: 1a Does your company now provide or plan to provide professional services to the federal government?

Yes ___ No ___ (If No, close interview)

QU: 1b What types of systems or services do you now provide or plan to provide?

	Current		Future		
	Yes	No	Yes	No	Why?
Consulting Services	____	____	____	____	_____
Education/Training	____	____	____	____	_____
Software Development	____	____	____	____	_____
Systems Operations	____	____	____	____	_____

QU: 2 What percent of your total professional services business was done with the federal government last year? _____

QU: 3a What percent of your federal professional services revenue was generated in each of these categories last year?

	% spent last year
Consulting Services	_____
Education/Training	_____
Software Development	_____
Systems Operations	_____
Other	_____

QU: 3b What was your company's total professional services revenue in dollars last fiscal year—both commercial and government? _____

QU: 3c According to your company's total professional services revenues, do you rank your company within the top 10 professional services vendors serving the federal market? Yes ____ No ____

QU: 3d What is your approximate rank? _____

QU: 3e What was you company's total corporate revenue in dollars for your most recent fiscal year? $ _____ FY _____

© 1990 by INPUT. Reproduction Prohibited.

QU: 4a Do you anticipate any change in the amount of professional services you will provide to the federal government in the next 2 to 5 years?
Yes ____ No ____

QU: 4b (If Yes)

In which of the following categories do you expect either an increase or decrease in the next 2 to 5 years, and can you estimate by what percent? This is federal government only.

	Increase	Decrease	No Change	% Change
Consulting Services	_____	_____	_____	_____
Education/Training	_____	_____	_____	_____
Software Development	_____	_____	_____	_____
Systems Operations	_____	_____	_____	_____

QU: 5 In your opinion, what technical factors will increase or decrease federal government spending on professional services in the next 2 to 5 years?

_____

_____

QU: 6 How would you rank the importance of the following professional services vendor characteristics in winning a bid?

1 - Definitely not important
2 - Somewhat important
3 - Important
4 - Very important
5 - Crucial

Characteristics	**Rank**
Application Functional Experience	1 2 3 4 5
Staff Experience	1 2 3 4 5
Hardware Experience	1 2 3 4 5
Software Development Experience	1 2 3 4 5
Support Functions	1 2 3 4 5
Federal Contract Experience	1 2 3 4 5
Agency Experience	1 2 3 4 5
Price	1 2 3 4 5
Other: _____	1 2 3 4 5

© 1990 by INPUT. Reproduction Prohibited.

QU: 7 Are you now qualified or do you plan to become qualified in Ada programming? Qualified Now _____ Planning To Be _____

QU: 8 In your opinion, which agencies provide the most attractive opportunities for your company in providing professional services to the government?

_____

_____

QU: 9 What differences do you see between commercial markets and the federal market for your products and services?

_____

_____

QU: 10 On a scale of 1 to 5, with 5 being the most satisfied, how would you rate the government's level of satisfaction with professional services vendors in the past regarding:

Characteristics	Rating
a. Quality of Work	1 2 3 4 5
b. Quantity of Work	1 2 3 4 5
c. Responsiveness to Agency Needs	1 2 3 4 5
d. Project Management	1 2 3 4 5
e. Development Visibility	1 2 3 4 5
f. Delivery Schedule(s)	1 2 3 4 5
g. Cost	1 2 3 4 5

QU: 11 What type of contract does your company prefer for the professional services category you provide:

Cost Plus _____ Fixed Price _____
Mix _____ Other (specify) _____

QU: 12 Which of your company's professional services or product capabilities do you think agencies find most attractive?

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

QU: 13 When you complete a professional services contract with the government for design, programming, and analysis, is follow-on support usually transferred in-house or left with you or another vendor?

In House _____
Out-Of-House Self _____
Out-Of-House Other _____

QU: 14a Have you ever lost any professional services contracts to government in-house staffs? Yes _____ No _____

QU: 14b Why?_____

_____

QU: 14c What types of applications? _____

_____

QU: 15 Have you ever acquired a contract for support functions which were previously done in-house by the government?
Yes _____ No _____

QU: 16 Could you identify those non-technical factors that would have the greatest impact on government professional services acquisitions?

_____

_____

QU: 17 What do you believe vendors need to do over the next 5 years to make their products and professional services more valuable to the federal government?

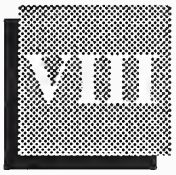
_____

_____

_____

© 1990 by INPUT. Reproduction Prohibited.

© 1990 by INPUT. Reproduction Prohibited.



About INPUT

Company Profile

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

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

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

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

Staff Credentials

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

U.S. and European Advisory Services

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

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

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

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

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

Customized Advisory Services

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

Acquisition Services

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

An Effective Combination

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

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

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

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

© 1990 by INPUT. Reproduction Prohibited.

Industry-Specific Market Reports

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

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

Cross-Industry Market Report

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

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

Hotline: Client Inquiry Services

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

The Information Center

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

Access to INPUT Professional Staff

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

© 1990 by INPUT. Reproduction Prohibited.

Client Conference

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

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

On-Site Presentation by INPUT Executives

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

Proprietary Research Service

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

For Business Planning

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

For Acquisition Planning

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

For the Total Acquisition Process

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

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

© 1990 by INPUT. Reproduction Prohibited.

For Competitive Analysis

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

For Market and Product Analysis

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

More About INPUT...

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

© 1990 by INPUT. Reproduction Prohibited.

For More Information . . .

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

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

North America

San Francisco
1280 Villa Street
Mountain View, CA 94041-1194
Tel. (415) 961-3300 Fax (415) 961-3966

New York
Atrium at Glenpointe
400 Frank W. Burr Boulevard
Teaneck, NJ 07666
Tel. (201) 801-0050 Fax (201) 801-0441

Washington, D.C.
1953 Gallows Road, Suite 560
Vienna, VA 22182
Tel. (703) 847-6870 Fax (703) 847-6872

International

London
Piccadilly House
33/37 Regent Street
London SW1Y 4NF, England
Tel. (071) 493-9335 Fax (071) 629-0179

Paris
52, boulevard de Sébastopol
75003 Paris, France
Tel. (33-1) 42 77 42 77 Fax (33-1) 42 77 85 82

Frankfurt
Sudetenstrasse 9
D-6306 Langgöns-Niederkleen, Germany
Tel. (0) 6447-7229 Fax (0) 6447-7327

Tokyo
Saida Building, 4-6
Kanda Sakuma-cho, Chiyoda-ku
Tokyo 101, Japan
Tel. (03) 3864-0531 Fax (03) 3864-4114

© 1990 by INPUT. Reproduction Prohibited.