Federal Information Systems & Services Market FY 1999-FY2004

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INPUT Offices

www.input.com

San Francisco
1881 Landings Drive
Mountain View
CA 94043-0848
U.S.A.
Tel: +1 (650) 961-3300
Fax: +1 (650) 961-3966

Washington, D.C.
1921 Gallows Road
Suite 250
Vienna, VA 22182 3900
U.S.A.
Tel: +1 (703) 847-6870
Fax: +1 (703) 847-6872

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Abstract

According to this report, *Federal Information Systems and Services Market, FY1999–FY2004*, the federal market demand for vendor-furnished information systems and services will increase from $26.1 billion in FY1999 to $34.0 billion in FY2004 at a compound annual growth rate of 5.4%.

The federal IT market continues to experience steady growth based on improved attitude toward the effectiveness of IT in reducing operating costs, and its status as a stable market for information technology vendors continues to be supported by both the White House and Congress. Both political entities have confidence that continued improvements in government program performance depend in large part on effective implementation of information technology solutions. Increasing political support for outsourcing, cost containment, further acquisition reforms, budget balancing measures, and continuous agency restructuring will influence the level and nature of outsourced IT spending in FY2000 and projected spending in the out-years.

The year 2000 concern appears to be diminishing. The Senate and the General Accounting Office are issuing statements that indicate that large numbers of mission critical programs have been tested and updated to accommodate the date requirements. Whether the agencies have been completely successful will be determined soon into fiscal 2000. For this reason, agencies are more focused now on contingency plans to reduce the risk of system failure.

Unquestionably, the greatest impact on federal government IT spending will come from the use of the Internet. The initial familiarization process associated with using this new technology is rapidly coming to an end. Agencies are turning to the Internet increasingly for program delivery. A new market for outsourcing application development and even application operation on the Internet will take shape through the next 12 months.

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I

Introduction

The Federal Information Systems and Services Market, FY1999–FY2004 is produced by INPUT as part of the Electronic Government Program (EG). This report forecasts information technology expenditures by the U.S. federal government for fiscal years 1999–2004 and includes analyses of the federal information technology budget submitted for fiscal year 2000.

EG was initiated by INPUT to support vendors and users in the federal IT market. The EG Program examines the driving factors and establishes the basis for forecasting individual service mode growth prospects. INPUT selects major service modes for analysis based on both client interest and major program initiatives of the Administration. Major initiatives of the Administration begun in 1993 have created interest in programs dealing with business process reengineering (BPR), high-performance computing, network management, electronic messaging (E-mail), electronic commerce, document management, the Internet and the World Wide Web (WWW).

INPUT expects to be conducting research in other important areas for government acquisition. These areas include ERP, Data Warehousing, Telecommunications, and Security.

The companion Federal IMPACT (INPUT's Multiple Procurement Activities) program focuses on contract opportunities with significant new or recompete business potential for INPUT's vendor clients. More than 600 of these opportunities are provided in the INPUT IT Opportunities database updated on the Internet daily. A newsletter summarizing recent database updates and procurement issues is distributed to INPUT's federal vendor clients via e-mail on a weekly basis. Conversely, the EG market action projects provide more strategic intelligence and trends within each delivery mode and by agency.

A
Scope

This report covers only the federal government information technology market and includes only those expenditures expected of the executive branch agencies and large independent agencies. INPUT bases its analysis on actual outlays from FY1987 through FY1998, the federal estimate for FY1999 and the federal forecast for FY2000. Note that embedded computer systems such as those found in weapons systems are not included in this analysis and market forecast. IT outlays for classified national defense and intelligence programs are also not included.

The major service modes included in this report are:

- Hardware products (furnished without systems design, applications software or communications services)
- Software and related services
- Professional services
- Systems integration
- Outsourcing (including systems operations)
- Turnkey systems
- Communications and network services
- Processing services
- Computer equipment maintenance

The service modes are defined in Appendix B. The definitions were revised in 1998 to clarify some subsets of the service modes that are identified as special delivery modes. The expenditures for the sub-modes identified are subparts of the service modes listed above and, therefore, not additive to them.

Funding information in this report is rounded to the nearest $ million, unless otherwise noted. In general, funding information is initially derived from plans and budget requests not yet approved by the Congress nor confirmed by the Office of Management and Budget (OMB) and may change even after approval. The Administration or subsequent congressional action may dictate such changes.

B
Methodology

To identify key expenditures in the service modes referenced above, INPUT analyzed the documents produced by the Office of Management and Budget (OMB), General Services Administration (GSA), National Institute of Standards and Technology (NIST), the *Budget of the United States Government*, federal agency responses to OMB Circular A-130 (Information Technology Plans) and OMB Circular A-11, Section 42 (Information Technology Budget Requests).

As agencies are not required to submit to OMB supporting data for their plans, INPUT requested additional documentation on their OMB A-11 submissions and long-range information resource management plans and reviewed the documentation for guidance on the forecast. Interviews with agency policy and procurement officials were conducted to identify technology trends, policy changes and issues associated with plans to improve federal information resources and the acquisition process. Additional information on published policies and regulations is included.

The section on market trends was prepared after interviews and research on the current IT budget submission were complete.

The INPUT forecast of five fiscal years' growth by service mode is based on OMB A-11, Exhibit 42 budget requests and off-budget plans covering various federal funds and public corporations.

For FY2000 agencies were required to report data on information technology (IT) in a new format, Exhibit 42. IT submissions for Exhibit 40 (b) (Report on Financial Management Systems) and for Exhibit 43 (Agency-wide Summary on Obligations for Information Technology) were no longer required. For more information on this change see OMB A-11, Exhibit 42 Circular A-11 on OMB's web site.

In order for INPUT to define and forecast the IT market in its more traditional form (i.e. equipment, software, services, support services, supplies, and personnel), it was necessary first to compile in summary format agency budgets for those agencies spending in excess of $50 million. Agencies below the $50 million reporting threshold were not required to report. After compiling the reporting agencies in the required format and making adjustments for the other agencies not reporting, INPUT translated the new format into the traditional market view of IT in the federal government.

INPUT established the economic factors for the five years under its commercial Market Forecast Programs and employed these factors for all INPUT program forecasts. The growth guidelines are developed from annual INPUT surveys of users (including government) and vendors, as well as agency budget requests for out-years.

INPUT segments the market, modeling the way federal users buy products and services, into nine categories with 27 subcategories:

- Computer Hardware - mainframes, PCs, servers, mid-range systems, supercomputers, etc.
- Systems Software Products - mainframe, midrange computers/servers, workstation/PCs
- Applications Software Products - mainframe, midrange computers/servers, workstation/PCs
- Turnkey Systems - equipment, software products, professional services
- Professional Services - consulting, BPR, education/training, software development
- Systems Integration - equipment, software products, professional services, other
- Outsourcing - platform operations, applications operations, desktop services, network management, applications management
- Processing Services - transaction, utility, other
- Network-Based Services - electronic information services, network applications.

Both agency and industry perspectives are gathered to create a government user demand profile:

- INPUT extracts federal budget information from federal agency submissions to the OMB. Agency strategic IT implementation plans are gathered. Agency Chief Information Officers (CIOs) and key agency information resource management (IRM) officials are interviewed for insights into future plans.
- INPUT gathers procurement data on 208 product/service codes (PSC) from the GSA Federal Procurement Data Center (FPDC). Federal agencies are required to report procurement data, including the contract obligation amount, on contracts exceeding $25,000 to the FPDC. Vendors are interviewed for their impressions of the marketplace and its direction.

C
Report Organization

In addition to the introduction, this report has been organized as follows:

II. Executive Summary

III. Federal IT Environment

IV. Market Forecast and Trends

V. Agency Forecast and Trends

VI. Conclusions and Recommendations

Appendices:

A. Forecast Database and Reconciliation

B. Definitions

D
Related INPUT Reports

Related current reports from the Electronic Government Program and other INPUT reports include:

Federal Information Systems and Services Market, 1998–2003

Federal Outsourcing Market View

The Impact of Network Computers on the Federal IT Industry

Benchmarking of Government Systems Integrators

Y2000 Preparedness and its Impact on the Federal Government

Evaluation of Federal Outsourcing Vendor Performance

Trends in Worldwide IT Services Contract Activity, 1998-1999

Outsourcing Vendor Performance Analysis - U.S. 1999

Worldwide Software and Services Vendor Analysis

Evaluation of SAP Services Providers, U.S. 1999

II

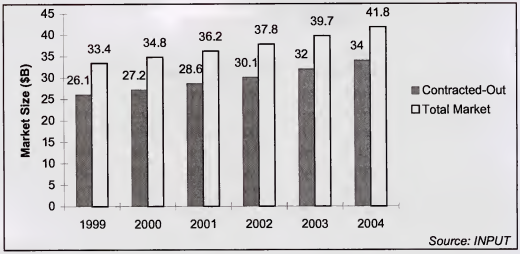
Executive Summary

A
Information Technology Budget, FY1999

The federal market for information technology is expected to increase from $33.4 billion in FY1999 to $41.8 billion in FY2004 at a compound annual growth rate (CAGR) of 4.6%. This includes capital investments for hardware and software, personnel, telecommunications services and support services. Of the FY1999 amount, 78.1% is considered the contracted-out portion – or those dollars that are available to contractors. The remaining 21.9% includes the internal costs for supplies and government IT personnel. The contracted-out portion of the IT budget is expected to reach $34.0 billion in FY2004, or 81.3% of the total IT budget, up from $24.0 billion in FY1997. This increase will occur at a CAGR of 5.4%. The increasing percentage of IT that is contracted-out highlights one of the major trends in the federal marketplace – the increased use of contractors to assist with technology implementation and deployment. Both the total IT budget and the contracted-out portion are shown in Exhibit II-1.

Exhibit II-1

Total Federal IT Market, FY1999–FY2004



Source: INPUT

Over the past few years, the federal workforce has been significantly reduced. This reduction is likely to level off over the next several years, as reflected in the President's budget for FY2000. Since the reduction has begun, federal agencies have needed to reorganize the remaining personnel in order to maximize productivity. The reorganizing federal workforce and internal cost controls have limited the growth of the total IT budget, but it has caused greater need for contracting for services. The contracted out portion of the IT budget has grown at a relatively healthy rate.

In total, the contracted-out IT budget will grow approximately 20% faster than the total IT budget. The budget for personnel expenditures is expected to increase slowly over the five-year period, contributing to the relatively slow growth of the total market. But slow growth in personnel spending will increase the proportional spending for IT products and services.

The most significant growth is anticipated in the support services segment. According to OMB, support services consist of commercial services that are employed in support of equipment, software or other services. This includes training, IT planning, IT consulting, software development, systems analysis and design and capacity management. All of these categories fall under the general term "professional services." This segment is expected to grow at a 6.6% CAGR over the period FY1999–FY2004 boosting the support services market to $16.1 billion by FY2004.

The breakout of the total federal IT market, as classified by the Office of Management and Budget, is shown in Exhibit II-2. Agencies spending in excess of $50 million on IT are required to report estimated expenditures

to OMB annually. For FY2000, agencies reported in only four parts. This is a significant change over prior years. INPUT has recast these four parts into the categories traditionally used for IT budget reporting, as shown in Exhibit II-2.

Exhibit II-2

Total Federal IT Market, FY1999 and FY2004

Budget Category	FY1999	FY2004
Equipment	17.6%	17.0%
Software	5.9%	6.2%
Services	17.1%	16.7%
Support Services	35.0%	38.5%
Supplies	1.9%	1.9%
Personnel	21.1%	18.5%
Other	1.4%	1.2%
Total	**100%**	**100%**

Source: INPUT

The federal government is expected to contract-out its IT requirements at an increasing rate. Exhibit II-3 shows a ten-year contracting history of the total amount spent in a given year on information technology and the portion of that total which was contracted-out. The proportion of IT dollars that are spent with contractors is expected to exceed 80% of the total federal market by FY2004. This is reinforced by Administration mandates and legislation that aim to reduce the internal burden of implementing IT solutions. Outsourcing is being promoted more and more as the government downsizes and internal resources become increasingly strained.

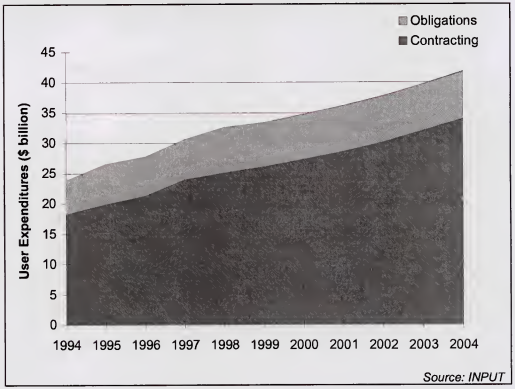
Some major drivers in the push to contract-out include:

- **Agency downsizing** – including cuts in overall mission areas as well as personnel. Agencies must justify the most important program areas in order to receive maximum funding.
- **Outsourcing of personnel** – contractors are not being used just for their products and services but also for the expertise of their staff.
- **IT "brain drain"** – as the government has downsized its workforce, valuable technical expertise has shifted to the private sector. Currently, there is a shortage of qualified IT personnel within the federal government. Many experienced individuals are attracted to the private sector and as a result, more importance is placed on the contractor to backfill the areas where shortages are occurring.

- **Support from the Administration and Congress** - as support for outsourcing has increased in both Congress and the Administration, agencies are looking more aggressively for internal activities that can be shifted to the private sector.

Exhibit II-3

Information Technology Contracting Trends, FY1994–FY2004



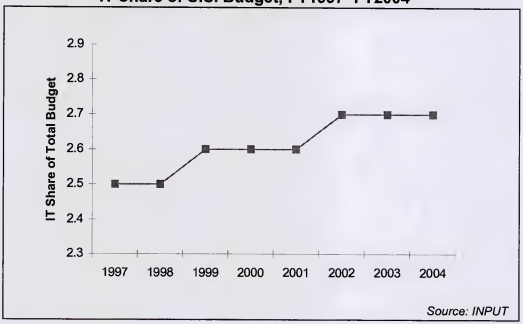
Source: INPUT

B
The Grand Scheme: Technology's Place in the U.S. Budget

As a result of the dedication of the current Administration to information technology and the acceptance of IT as an integral part of federal business processes, the portion of the overall budget which is set aside for IT is experiencing steady growth. This is depicted in Exhibit II-4. For FY1999, IT is expected to make up about 2.5% of the overall U.S. budget and this percentage is expected to grow to about 2.7% by FY2004. This growth once again highlights the importance of IT to the federal government and its acceptance as a process enabler rather than just a support function. This percentage is one of the highest ever, with the exception of the late 1980s defense buildup, which incorporated a large amount of information technology. The balanced budget will also influence the proportion of IT due to the fact that IT areas will be some of the last areas to be cut from the budget, while other non-critical areas will experience significant spending cuts. The result is a decrease in the overall budget while the IT portion remains relatively constant.

Exhibit II-4

IT Share of U.S. Budget, FY1997–FY2004



Source: INPUT

C
Federal IT Budget Components

As stated previously, the overall addressable federal market for information technology is estimated to reach $26.1 billion in FY1999 and is expected to grow to $34.0 billion in FY2004, with overall growth occurring at a 5.4% compound annual growth rate (CAGR) over the

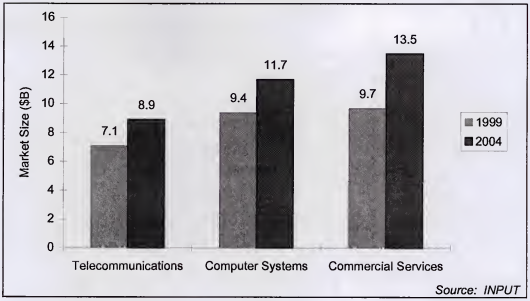
period. The most significant growth (6.8% CAGR) will occur in the commercial services area, where the market is expected to reach $13.5 billion by FY2004. This trend highlights the growing importance of services to the federal government. Services such as application development and IT consulting are major federal growth areas and this growth is expected to continue as the government faces the year 2000 problem, workforce downsizing, platform migration issues, the impact of Electronic Government and business process change. The market for information technology in the federal government is shown in Exhibit II-5.

Certain key observations may be made in these three main market segments:

- In the commercial services segment, workforce downsizing, business process change, electronic government, the emergence of Internet/Intranet applications and the move to COTS solutions will result in increased demand for professional services.
- In the computer systems segment, leasing will play a key role as will the concept of "outsourcing the desktop" with contracts such as Seat Management and ODIN taking hold. Also, COTS solutions and Enterprise Resource Planning (ERP) applications will become more widespread as software development growth slows in comparison. Despite the appearance of only average growth, the volume of equipment sold is expected to grow substantially. This growth is countered by rapidly falling prices for hardware and systems software. The price/performance discrepancy places more onuses on the contractor to move high volume.
- In the telecommunications segment, the need to bridge distributed operating environments as well as the linking of the downsized workforce via electronic means will promote the need for communications and network services. However, the increasing role of the Internet on service delivery, and in a growing number of cases on telecommunications backbone for Intranets and Extranets, will reduce agency telecommunications costs. Only the lack of demonstrable security and a full suite of integrated IP services for the Internet will prevent wholesale reduction in agency spending for backbone support. At the same time, network service costs will increase.

Exhibit II-5

Total Federal Market, FY1999–FY2004



Source: INPUT

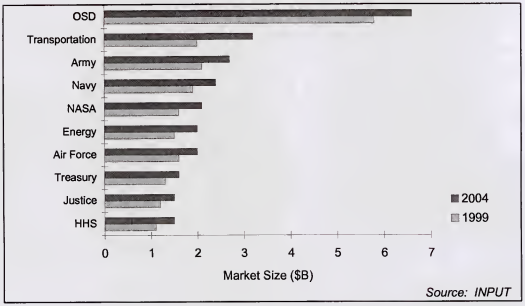
D
Agency Spending

Not surprisingly, when broken down to the agency level, the highest proportion of IT dollars is expected to be spent by the Office of the Secretary of Defense, exclusive of the three uniformed services. Each of the uniformed services also ranks in the top ten. The contracted out IT budgets of the top agencies are shown in Exhibit II-6. The contracted out portion represents dollars, potentially available to contractors, or the total less internal costs for supplies and personnel.

As is discussed in subsequent sections of this report, outsourcing initiatives will play a major role in shaping the new federal IT market. Agencies have come to realize the essential benefits of private sector assistance and are finding new initiatives to outsource and new ways in which to do so.

Exhibit II-6

Top 10 IT Contracting Agencies, FY1999 and FY2004



Source: INPUT

E
Geographic Spending

In addition to the interesting trends at the agency level, there are some important issues to examine on the geographic level. In 1993, 42% of spending took place in the Metropolitan Washington, DC area as compared to 39% in 1997. This shows a trend in government toward distributed contracting. In the past, a large amount of an agency's contracting activity was done at the headquarters level in the DC metro area. In recent years, personnel reductions and decentralization have resulted in increased contracting at the regional level. Part of this is due to the eased procurement regulations as well as the power of technology to allow agencies to operate under more geographically diverse conditions – or the ability to conduct business over wide area networks and the Internet. There is less reliance on the parent agency or the headquarters location. This has placed increased pressure on contractors to have a nationwide and even global sales presence in order to cover the breadth of regional opportunities.

Exhibit II-7 shows the breakout of total IT contracting dollars in FY1997. Maryland and Virginia still realized a healthy degree of contracting activity, as did California, Florida and Texas. The numbers also highlight the fact that the Midwest, as well as other up-and-coming IT-friendly states, cannot be discounted due to a significant amount of IT contracting being done in the region.

Exhibit II-7

Top 20 IT Contracting States, FY1994 and FY1998

	% of Obligs. – 1994	% of Obligs. – 1998		% of Obligs. – 1994	% of Obligs. – 1998
Virginia	16.90%	23.70%	Missouri	1.5%	2.4%
Maryland	10.60%	12.30%	Alabama	2.4%	2.3%
California	12.60%	8.90%	Washington	1.1%	2.1%
Washington, DC	13.50%	8.20%	Ohio	2.1%	1.9%
Texas	4.70%	8.20%	Pennsylvania	1.8%	1.6%
Florida	5.90%	4.30%	Indiana	1.1%	1.2%
New Jersey	2.70%	2.80%	South Carolina	0.7%	1.2%
Massachusetts	3.50%	2.60%	Georgia	0.9%	1.0%
Colorado	1.90%	2.30%	North Carolina	1.2%	0.9%
New York	2.50%	1.80%	Louisiana	0.7%	0.8%

Source: FPDC, INPUT

F
Influential Market Trends and Drivers

Certain key elements will influence the federal IT market over the next five years. Some of these factors are non-IT related but will place pressure on IT areas. First and foremost is the issue of constrained program accounts. As the government attempts to reengineer itself and remove excess spending layers, more of an onus is placed on program managers to justify their need for money. It becomes increasingly difficult to obtain funding for certain programs. These inherent budget constraints hinder the ability of the federal IT market to grow concurrently with the commercial market. Whereas the commercial market is demand driven, resulting in unlimited possibilities for IT, the federal market is limited by the budget set forth at the start of the fiscal year. The overall result is limited growth in all federal markets, including information technology.

Coupled with budget constraints are staff reduction issues. Downsizing of the federal workforce has actually helped the federal IT market in recent years. As the amount of available personnel decreases, the demand for IT to backfill under-staffed areas increases. IT solutions supplement the federal worker by easing the workload and automating mission-critical processes. This will become more evident as the Y2K problem evolves. It is expected that the federal government will require large amounts of federal workers to be diverted from their normal functions to assist with

the problem. IT will be required to support ongoing programs and projects.

Procurement reforms implemented in 1996 also continue to play a part in the growth of the federal IT market. The change in regulations has eased the process for obtaining necessary technology, resulting in a faster procurement process and implementation of more up-to-date technological solutions. GSA Schedules and the use of government credit cards will continue to be key to the acquisition of information technology by federal agencies, especially for off-the-shelf hardware and software.

These and other factors listed in Exhibit II-8 will affect the government's acquisition of information technology over the next five years.

Exhibit II-8

Market Drivers – Overall Federal Government

Budget constraints
Staff reorganization
Impact of Electronic Government initiatives
New buying vehicles/procurement reform
Administration's dedication to IT

Source: INPUT

There are key market drivers in the information technology market as well. These include the new focus of all decision-makers on using IT as an integrated part of the business process. The demand will increase for these integrated solutions. Also, the Internet has revolutionized the way in which business is conducted around the world. This medium opens immense possibilities that are just now beginning to be realized commercially as well as in the federal government.

Enterprise resource planning applications are also increasing in demand in all vertical markets. Organizations are using the Internet and integration services to tie together functions of an organization on an enterprise-wide level. This trend has been slower to impact the federal market but will play a major role in the federal IT market over the next five years. This is especially true considering the move of the federal government toward distributed environments where a business function may be conducted by numerous operating units across a wide geographic space. Technology bridges the geographic gap and allows for real-time implementation of mission-critical operations.

Some of the major IT market drivers that will influence the five year market projection are shown in Exhibit II-9.

Exhibit II-9

Market Drivers – Overall IT Market

Focus on interoperable solutions
Internet/Intranet technology becoming a core component of IT
Increased interest in enterprise resource planning (ERP)
Move toward distributed operating environments
Increased demands for secure information resources

Source: INPUT

In addition to general federal market drivers and general IT drivers, there are also some specific federal IT market drivers which will play into the forecast for IT spending over the next five years. These are shown in Exhibit II-10 and are explained in further detail in the following chapters.

Exhibit II-10

Market Drivers – Federal IT Market

Shortage of experienced labor
Year 2000 failure contingencies
A-76 regulation/public vs. private competition
Leasing and "desktop outsourcing"
Secure network services

Source: INPUT

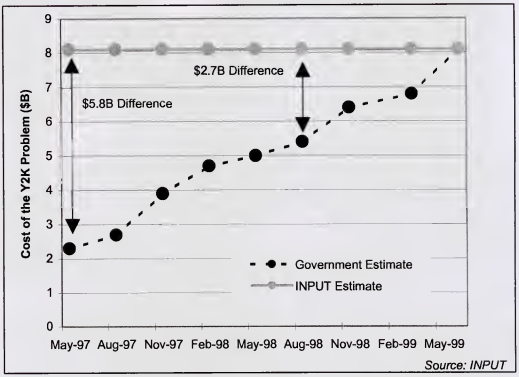
Perhaps the most talked about IT problem facing federal agencies today is security. Agencies have acknowledged concerns for security awareness and protection against their information resources, but they have not anticipated the extent to which the lack of security impedes development of new systems that are interoperable across an enterprise.

The Y2K problem has residual effects upon computer-based operations. While most agencies have been able to assure that their environments are protected against Y2K failure, they have not fully acknowledged interoperability problems that could result when incompatible Y2K solutions impact the transfer of data across agency boundaries, or even across government boundaries with the private sector.

Federal cost estimates have increased with every quarterly federal Y2K progress report. INPUT estimated in its 1997 report "Y2000 Preparedness and Its Impact on the Federal Government" that the problem would cost $10.9 billion to fix from 1997 to the end of 1999. Of this, $8.1 billion was estimated to be external costs – or dollars available to contractors, as shown in Exhibit II-11.

Exhibit II-11

Federal Costs Associated with Year 2000



Source: INPUT

The estimates reached $8.1 billion in the June 1999 progress report. In addition, INPUT believes that current government estimates are severely understated. In the year 2000, INPUT estimates that the additional cost of final remediation and the implementation of contingency plans will add another $500 million to the final cost. Both INPUT's and the government's expected Y2K costs are shown in Exhibit II-11.

F
Conclusions

From all of these trends and market projections, one can draw certain conclusions about the future of the federal IT market. Each of these is discussed in Chapter 3 and introduced in Exhibit II-12. Of significant importance is the trend toward mergers and acquisitions. As companies merge, the playing field becomes more limited. Larger companies with various capabilities and larger marketing budgets gain advantages over smaller, more specialized companies, when pursuing large opportunities and task order business. In order to succeed, those smaller vendors will have to rely on strong teammates and subject matter expertise to present a viable solution to the agency's needs.

With procurement reform making it easier for agencies to obtain IT products and services, it was thought that smaller contracts would be relegated to smaller companies. Only recently have agencies begun to realize that small businesses were not able to compete as effectively in the new "task order" environment even though their solutions may have been more cost effective due to the tremendous marketing resources needed to identify and chase smaller task order requirements.

Exhibit II-12

Conclusions

- Companies will continue to consolidate, resulting in a smaller competitive base
- Services will be key in determining successful offerors
- Enterprise resource planning applications will become a major market segment, once ERP vendors can scale to the size of many government programs
- The government will move toward enterprise systems
- Competition among federal vendors will increase with decreased profit margins
- Outsourcing in all forms will become more commonplace
- Agencies will continue to focus on past performance
- The Y2K issue will continue to threaten agency performance
- New technology and niche players will promote the need for standards
- Strong teams will be essential for success

Source: INPUT

The following recommendations will assist vendors in maintaining their competitive edge to take them into the 21st Century:

Exhibit II-13

Recommendations

- Anticipate continuation of increased competition beyond contract award
- Maintain focus on marketing activities, especially post-award marketing
- Be cognizant of agency requirements and acquisition reform
- Understand agency requirements from an "enterprise" standpoint as well as a program standpoint
- Emphasize cost-effective solutions
- Provide adaptive COTS products
- Take note of emerging technologies
- Establish a regional presence – closer contact with the client
- Build strong and competent teams
- Develop relationships with CIOs and other agency decision makers

Source: INPUT

The federal information technology market is in a state of change, partly due to the federal acquisition reforms of 1996 but more recently to the year 2000 issue and the push for distributed computing environments. This state of flux has created a degree of uncertainty which makes clear predictions and forecasts of the market and its future composition difficult at best. One of the few things that can be asserted with confidence is that this market will change significantly over the next five years, but certain segments will enjoy consistent growth. Overall, the government will spend in excess of $150 billion on IT from FY1999 to FY2004.

III

Federal IT Environment

Many factors operate concurrently to shape the federal IT market. There is no single factor that acts alone in influencing budget and spending levels. This chapter identifies and discusses major factors influencing the market today and over the next five years. These factors include, but are not limited to, the following:

- Restructuring the downsized federal workforce and IT "brain drain"
- The increasing influence of the Internet on program delivery
- Targeted IT spending based on performance benefits
- Budget surplus allocation
- Influences toward the use of commercial services and outsourcing
- Increasing focus on acquisition and IT management reforms
- Continued dependency on COTS products

A
FY2000 Federal Budget

Reported actual spending for FY1998 ($32.6 billion) was higher than estimated ($31.8 billion) last year, as was the case for FY1997. Estimated spending for FY1999 is on par with FY1997–1998 spending levels. Actual spending has exceeded budget levels, reversing a trend begun in FY1992. However, government estimates for FY1999 spending ($33.4 billion) is approximately the same as forecast ($33.5 billion) from the prior year. This appears to be a slowdown in IT spending, but when compared to overall government discretionary spending, it represents an increased percentage. Modest spending increases are forecast for FY1999 and for out-years. The FY1998 budget process was marked with concerns for spending reductions and improved government services, and this concern was realized through the FY1999 budget preparation.

The Administration has since demonstrated a budget surplus, and a continued commitment to the use of IT products and services to increase the overall performance of programs while keeping overall spending levels down. This commitment to IT shows up in the 4.0 percent increase in FY2000 spending over FY1999, compared to the 2.6 percent increase from FY1998 to FY1999.

The budget and the economy operate together, each influencing the other as changes occur. A slackening in economic growth tends to increase the size of the deficit. Increasing unemployment rates influence lower GDP growth. Increases in unemployment also increase federal outlays for entitlement programs, such as food stamps and unemployment compensation.

Under the Budget Enforcement Act of 1990 (BEA), the budget is divided into two exclusively separate categories: discretionary and direct (entitlement). Discretionary spending refers to programs in the Administration's operating plan. Spending for such programs is limited through FY2000 by receipts such as tax collection and service fees. Spending on discretionary programs that exceed appropriated outlays triggers a sequester to eliminate overspending.

Entitlement programs include guaranteed payments to congressional programs such as food stamps, social security, and Medicare/Medicaid. Entitlement spending continues to be the largest category of federal spending. It represented 68% of outlays in FY1999 and is expected to grow to 70% by FY2004. This upward trend will continue unless Congress drastically curtails the eligibility formulas (not under the control of the Administration). Unlike the annually authorized and appropriated discretionary expenditures, entitlements are defined by eligibility, not by population size, taxes or Administration initiatives.

B
Federal Budget Drivers

1. Administration Motivators

In order to understand the driving forces behind the federal budget and, consequently, the IT budget, it is first necessary to examine the motivation of the current Administration. To date, the Administration has placed a large emphasis on social programs, including education, family, health care, drug control and the environment. Included in this emphasis is the role of information technology as a process enabler – or a facilitator in the accomplishment of federal goals. Following are various Administration motivators currently driving the overall federal budget:

a. Desire to Invest in People and Technology

The government invests in people by promoting public health and safety, encouraging opportunity and individual responsibility and assisting in the formation of human capital through education and training. This last function is especially vital in today's high-technology economy, where a skilled work force is an essential condition for future growth. Gradually, the U.S. workforce is becoming more skilled. One problem in recent years within government, however, has been the IT "brain drain" – or the flight of skilled workers from government to the private sector in search of higher salary and benefits. The Administration and agency decision makers are currently battling with the issue of continuous loss of skilled employees and its impact on the government's ability to accomplish mission objectives versus the need to ensure technological competence of all Americans, including those in private industry.

The Secretary of Commerce announced in July of 1999 that in only seven years the demand on information technology workers will more than double over existing demands.

b. Need to Control Government Spending and Fiscal Policy

As a result of tight controls on spending, a strict monetary policy, and the results of the Balanced Budget Act of 1997, the government has earned a significant budget surplus. The President has proposed a framework for saving Social Security that will use 62 percent of the surplus for the next 15 years to strengthen the Trust Fund until the middle of the next century. Part of the surplus dedicated to Social Security would be invested in private securities, further strengthening the Trust Fund by drawing on the long-term strength of the stock market, and reducing the debt to ensure strong fiscal health. This proposal is aimed at keeping Social Security secure until 2055. Once Social Security is taken care of, the President will turn his efforts to save and improve Medicare—ensuring that the Medicare Trust Fund is secure for 20 years.

c. Offsetting Government Cost Through User Fees

The Budget contains proposals for a variety of new and expanded user fee and other collections that would yield $4.2 billion in 2000 and $25.8 billion from 2000 through 2004. These proposals establish, increase, or extend fees in order to recover more of the costs of providing government services. The proposals (Exhibit III-1) would make the program funding levels at least partly dependent on the amount of fees actually collected. Therefore, in many cases, resources available for the program could be greater or less than estimated.

Exhibit III-1

Level of Proposed User Fees

Discretionary fee proposals	2000	2001	2002	2003	2004
Agriculture	612	612	612	612	612
Commerce	57	57	57	57	57
HHS	262	335	335	335	335
Justice	28	28	28	28	28
Labor	85	85	85	85	85
Transportation	73	197	197	197	197
Treasury	475	475	475	475	475
Army COE	7	7	7	7	7
NTSB	10	10	10	10	10
Total	1,608	1,806	1,806	1,806	1,806

Dollar amounts in $million *Source: President's Budget*

d. Need to Continue Research & Development

Continued leadership in science and technology is a cornerstone of the President and the Vice President's vision for America. The Administration is proposing $77.1 billion in outlays for research and development (R&D) activities in 2000, including $38.7 billion for civilian R&D—a six percent increase over 1999. Exhibit III-2 shows the breakout of budget dollars for R&D spending in 2000. The rate of change is shown to demonstrate the growth and reduction areas. In total, the dollars for R&D remain the same as in FY1999.

Exhibit III-2

Federal Research and Development Expenditures

Agency	1998 Actual	1999 Estimate	2000 Proposed	% Change: 1999-2000
Defense	37,844	37,186	34,992	–6%
Health and Human Services	12,685	14,226	15,582	9%
NASA	10,251	10,032	9,620	–4%
Energy	6,730	7,194	7,495	4%
National Science Foundation	2,302	2,334	2,634	11%
Agriculture	1,546	1,671	1,707	2%
Commerce	835	862	864	0%
Interior	451	519	618	19%
Transportation	661	573	1,324	131%
Veterans Affairs	564	658	662	1%
Environmental Protection Agency	527	638	652	2%
Other	958	966	983	2%
Total	73,354	76,859	77,133	0%

(Outlays, dollar amounts in millions)
Source: President's Budget for Fiscal Year 2000

e. Desire to Cut the Size of Government

The Administration has built a strong economy that boosts revenues and lowers spending on unemployment and other benefits, but has also cut unnecessary or lower-priority spending. Led by the Vice President's National Partnership for Reinventing government (NPR), efficiency and effectiveness of government have improved.

The Administration has cut the size of the federal civilian work force by more than 365,000 people, creating the smallest work force in 36 years and, as a share of total civilian employment, the smallest since 1933. Exhibit III-3 shows the changes in employee levels for the Executive agencies. Through these reinvention efforts, the Administration has saved more than $140 billion over the last five years.

Exhibit III-3

Federal Employment in the Executive Branch

(Civilian employment as measured by Full-Time Equivalents, in thousands)

Cabinet agencies:	1998	1999	2000	Percent Change
Agriculture	96.4	98.0	97.6	–15.6%
Commerce	35.7	47.5	92.9	152.9%
Defense-military functions	707.2	686.5	662.9	–28.8%
Education	4.5	4.7	4.7	–5.7%
Energy	16.3	16.5	16.2	–21.5%
Health and Human Services	57.9	60.5	62.0	–4.5%
Social Security Administration	64.0	63.8	63.6	–2.8%
Housing and Urban Development	9.8	10.6	10.6	–22.3%
Interior	66.5	68.3	69.9	–11.8%
Justice	117.3	124.1	128.7	29.5%
Labor	16.3	16.9	17.4	–5.1%
State	26.4	26.9	27.6	–21.2%
Transportation	63.4	65.0	65.8	–6.5%
Treasury	142.1	145.4	146.1	–12.0%
Veterans Affairs	207.1	205.4	197.9	–14.8%
Environmental Protection Agency	17.7	18.4	18.4	–0.9%
General Services Administration	14.1	14.2	14.2	–31.5%
NASA	19.1	18.8	18.2	–29.4%
Total, Executive Branch civilian	1,790.2	1,801.6	1,816.8	–15.7%

Source: President's Budget for Fiscal Year 2000

f. Grants to State and Local Government

Federal grants help state and local governments finance programs covering most areas of domestic public spending, including income support, infrastructure, education, and social services. Federal grant outlays were $246.1 billion in 1998 and are estimated by the Administration to increase to $262.2 billion in 1999 and $283.5 billion in 2000. Grant outlays for payments for individuals, such as Medicaid, are estimated to be 62 percent of total grants in 2000; for physical capital

investment, 17 percent; and for all other purposes, largely education, training, and social services, 21 percent.

Federal aid to state and local governments is also provided through tax expenditures. Tax expenditures are revenue losses due to preferential provisions of the Federal tax laws, such as special exclusions, exemptions, deductions, credits, deferrals, or tax rates. In Exhibit III-4, the budget dollars in grants to state and local governments show where increases will occur for FY2000. Clearly, the additional support to Medicare/Medicaid is seen in the budget for DHHS.

Exhibit III-4

Federal Aid to State and Local Governments

Agency	1998	1999	2000
Department of Health and Human Services	138.8	149.1	160.2
Department of Transportation	26.1	29.1	31.6
Department of Housing and Urban Development	24.3	23.5	24.6
Department of Education	18.1	18.7	21.4
Department of Labor	7.2	8.5	9.3
Department of Justice	3.5	3.6	5.5
Environmental Protection Agency	2.7	3.0	3.4
Federal Emergency Management Agency	1.9	2.3	2.5
Department of the Interior	1.9	2.3	2.2
Department of Agriculture	0.5	0.5	0.6
Department of the Treasury	0.4	0.4	0.4
Department of Veterans Affairs	0.3	0.3	0.4
Department of Energy	0.2	0.2	0.2
Other agencies	1.7	1.5	1.4
Total ($million)	246.1	262.2	283.5

Source: President's Budget for Fiscal Year 2000

2. Increases in Defense Spending

One of the areas of major change in spending over the next several years will appear in Department of Defense spending for military readiness. Each of the service areas will see increases in program spending, as listed below.

- The Army will maintain one mechanized division in the Pacific region and two divisions with elements in Europe.

- The Navy will maintain an overseas presence, defined by the percentage of time regions are covered by an aircraft carrier battle group, at 100 percent in the Pacific, 75 percent in Europe and 75 percent in Southwest Asia.
- The Air Force will maintain two fighter wing equivalents in the Pacific, one in Alaska, two in Europe and one in Southwest Asia.
- The Marine Corps will cover the Pacific region with a Marine expeditionary unit or amphibious ready group one hundred percent of the time, Europe eighty percent of the time, and Southwest Asia 50 percent of the time.
- The Marine Corps will maintain three Marine expeditionary forces, three active and one reserve divisions, three active and one reserve air wings, and three active and one reserve force service support groups.
- DOD will recruit 203,000 new members of the armed services, and transform its support functions.

C
IT Market Drivers

1. Priority Management Objectives - Interagency

The Administration has developed a set of priority management objectives that establish a framework for information technology spending over the next five years. These objectives, although broad, give some perspective as to the use of IT to accomplish mission objectives:

- Protect the Information Infrastructure - Develop a secure and reliable information system infrastructure to protect the health and well being of the American economy.
- Electronic Government – Improve the electronic government initiatives already begun and invest in new ones.
- Year 2000 - Manage the year 2000 computer problem in a timely and cost-effective manner to ensure that no critical federal programs fail as a result of this problem.
- GPRA - Implement the Government Performance and Results Act in a timely and compliant manner to improve agency program performance.
- Financial Management - Present performance and cost information in a timely, informative and accurate way, consistent with federal accounting standards; resolve systems and record-keeping problems.

- Acquisition Reform - Provide greater customer satisfaction through acquisition reform in terms of price, timeliness, quality, and productivity; increase use of performance-based service contracting.
- Statistical Programs - Strengthen the quality, utility, accessibility and cost-effectiveness of federal statistical programs.

2. Priority Management Objectives - Agency-Specific

In addition to these government-wide priorities, there are also established priorities for some agencies. These include:

- Commerce – Improve management of the decennial census.
- Defense – Revolutionize DoD business affairs.
- Education - Modernize the management of student aid benefit delivery by reforming contracting, system development and program oversight practices.
- Energy - Use prudent contracting and business management approaches that emphasize results, accountability and competition; improve timelines, minimize costs and ensure customer satisfaction.
- Health & Human Services – Strengthen HCFA's management capacity.
- Housing & Urban Development – Implement reform processes.
- Justice – Reengineer the naturalization process and reduce the citizenship application backlog.
- NASA – Manage risks in building the international space station.
- Veterans Affairs - Work to consolidate infrastructure (hospitals, regional offices, data centers) where service improvements and efficiencies can be achieved.
- Social Security Administration - Reduce the processing time for disability claims and appeals in the Disability Insurance and Supplemental Security Income programs at lower administrative costs.
- State – Improve security at diplomatic facilities around the world.

3. Information Technology Investments for Program Performance

Several major federal programs will receive attention, as well as increases in IT support over the next three years. Exhibit III-5 shows the magnitude of the Administration's interest in leveraging value from its investment in IT.

Exhibit III-5

Program Performance Benefits From Major Information Technology Investments

Agency	Program	1998	1999	2000
Agriculture	Common Computing Environment	90	50	90
	Field Automation and Information Mgt	7.8	11.9	12.1
	Integrated System Acquisition Project	10.4	6.1	8.6
	Forest Service Infrastructure Modernization	113.6	100.1	101.9
Commerce	Advanced Weather Interactive Processing System	112	85	61
	Census 2000	148	148	280
Defense	Defense Message System	89.1	110.9	111.7
	Composite Health Care System II	0.3	0.3	0.3
	Global Command and Control System	86.7	119.1	122.6
Education	Direct Student Lending	168	225.1	297.3
	National Student Loan Data System	25.8	39.9	53
	PELL Grant Systems	5.5	9.9	8.4
	Federal Family Education Loan Data System	15	22.1	27.3
	Student Aid Application System	59	64.3	71.9
	Constituent Communications	29.2	33.8	43.1
Energy	Business Management Information System	1	3	16
	Replacement Telecommunication System	33	31	28
HHS	FDA—Electronic Regulatory Submission	24.9	33	33.1
	NIH/National Library of Medicine Medline	2.5	3.3	3.6
	Federal Parent Locator Service	29	28.9	30.6
HUD	Financial Management Support	57.3	22.2	29.7
	Non-Financial HUD 2020 Initiatives	20.8	2.9	17.1
	Other Key Information Projects	58.4	20.5	23.3

Exhibit III-5 continued.

Agency	Program	1998	1999	2000
Interior	Automated Land Management Records System	33	35	19
	Trust Fund Accounting System	6.8	9.7	14.9
	Trust Asset Accounting and Management System	3.3	2.4	15.3
	Royalty Management Program Re-engineering	1	5	15
Justice	Integrated Automated Fingerprinting Ident. System	98	65	27
	National Criminal Information Center 2000	17	19	8
	Information Sharing	5	62	65
Labor	ERISA Filing Acceptance System	11	9	6
State	Diplomatic and Consular Systems Modernization	259.6	290	236
DOT	Display System Replacement	207	179	121.6
	Std Terminal Automation Replacement System	128.3	201.3	194.3
	Wide Area Augmentation System	147.6	96.9	116.5
Treasury	Information Technology Investments	295	211	0
	Treasury Communications System	221	239	200
	Automated Commercial Environment	15	8	0
VA	VA Medical Enrollment System	16	10	13
	VISTA Clinical Medical Data System	293	305	351
EPA	Toxic Release Inventory System	8	8	8
NASA	Earth Observing System Data Information System	206.6	206.2	186.8
GSA	FTS 2001 Program	10	9	0
	CFO Financial Management System	7	9	0
NRC	Document Access and Management System	7	3.7	2.2

Source: President's Budget for Fiscal Year 2000

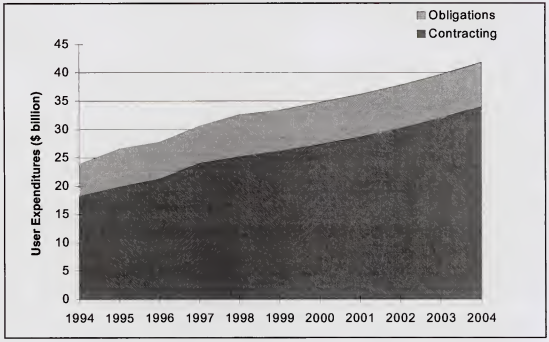
D
Federal IT Environment

1. Contracted-Out Portion of the IT Budget

The contracted-out portion of the IT budget is expected to increase with respect to the total due to the reduced federal workforce, as shown in Exhibit III-6. Outsourcing services will claim increasingly large amounts of the contracted dollar.

Exhibit III-6

Federal IT Budget, FY1994–FY2004



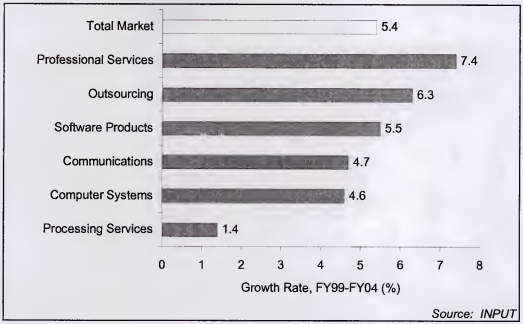
Source: INPUT

2. Sub-Market Growth Rates

Each of the subsegments of the federal IT market will experience growth over the next five years. Key areas, as will be discussed in Chapter 4, include professional services, systems integration and outsourcing. These growth rates are shown in Exhibit III-7.

Exhibit III-7

Market Segment Growth Rates, FY1999–FY2004



Source: INPUT

E
Application Area Observations

1. Applications by Equipment Size

All platform sizes play a role in the increasingly decentralized and networked environments of government user organizations. The federal user community demands powerful shared resources that can support a myriad of department and data center functions.

Functional application demands for supercomputers have not kept pace with requirements for the improved price/performance of desktop and floor-standing workstations. Supercomputers and large-scale parallel processors still are required, but more for infrastructure support and specialized scientific applications. With the emergence of Windows NT and high-performance PC-based servers, functional applications are increasingly targeted for microprocessor platforms.

Microcomputers and workstations are employed more and more as network, Internet and database servers. Unix workstations are increasingly used in support of high-speed networks and large databases and the federal market is now realizing considerable demand for Windows NT.

The role of the midrange continues to decrease across most application areas while the role of the mainframe continues to be strong in support of functional systems, but less so for message-based operations. The supercomputer remains strong for scientific environments and information analysis.

A new emphasis on the use of IT as a utility targets the desktop environment. In FY1998, the Alcohol, Tobacco & Firearms Bureau put a contract with Unisys Corp. in place to outsource support for its desktop processors and its LANs. Two contracts awarded during FY1999, Seat Management (GSA) and Outsourcing Desktop Initiative (NASA), are leading a trend in the way IT is procured. Under these contracts, the user obtains a "service" that assures standard processing across the desktop, both in terms of hardware and software. If successful, these contracts may revolutionize the way an agency maintains its desktop environment.

Mainframes still exist in the federal marketplace. Some applications obviously cannot be downsized from a mainframe. Applications such as order processing, enterprise networking, analytical processing, large relational database programs and high volume account processing require a high level of computing power and speed that smaller computer systems still cannot provide. Not insignificant in the role of the mainframe is the continuing dependency on legacy systems and databases unconverted from their original mainframe based languages. Due to the existing infrastructure, many agencies are considering the implementation of enterprise applications. Companies such as PeopleSoft, Oracle and SAP are developing enterprise resource planning (ERP) applications specific to the federal government and are designed to run on the infrastructure that is currently in place.

2. Growth Applications

As the government evolves and requirements change, different demands are placed on the private sector for technology. IT is an integral part of many federal business processes. As a result of technology innovations, new growth areas are emerging in the federal IT market. Some of the areas expected to sustain the most growth over the next five years are:

- Enterprise Resource Planning (ERP)
- Communications
- Computer and Network Security
- Desktop Services
- Document Management

- Electronic Government

a. ERP

The ERP market presents an opportunity for federal agencies to coordinate their various enterprise systems that deal with financial and personnel management, as well as other distributed resources. These environments foster the implementation of enterprise solutions.

The need to bridge the gap between agency functional requirements and diminishing personnel levels will also accelerate the implementation of ERP applications. Communication has become essential in a government that has lost a large part of its internal workforce over the last five years.

b. Communications

Virtually every application in the federal government contains an element of communication. This is increasingly true as processing architectures are becoming decentralized. Internet/Intranet solutions push requirements for data communications, and the growth of data and document transfer requires robust communications networks. Collaborative computing (a.k.a. Lotus Notes and Microsoft Exchange) also drives network infrastructure. Intranets are planned for intra-agency programs that will avoid the "publicness" of the Internet and inherent requirements for standard addressing and transmission.

One significant communications impact expected through the next year is the transition from the FTS2000 telecommunications contract. While the replacement FTS2001 is not mandatory, several agencies will continue to use the GSA administered contract to support its communications requirements.

c. Security

With the increased federal use of electronic commerce and the Internet, data security becomes a more crucial issue than ever before. The need for security on all levels will play a major part in the vehicles and contractors chosen to implement IT solutions. An integral part of the successful expansion of government Internet usage will be the implementation of a Public Key Infrastructure. As the Department of Commerce and Department of Defense push this new technology, more agencies will follow suit.

d. Desktop Services

As mentioned previously, desktop services, especially desktop outsourcing, may play a major role in the federal market. The implementation of IT as a "utility" gives new form to the hardware,

software and services markets. It also reshapes the way the government views IT. Instead of carrying IT as an asset that eventually becomes obsolete and loses value, IT is treated as a utility with technology refresh and upgrades as well as numerous professional services being cornerstones of a support contract. It is still too soon to tell the impact that Seat Management and other desktop services contracts may have on the federal IT environment. However, if successful, these contracts will have a significant and lasting impact on the federal government's investment in PC based computers.

e. Document Management

The role of document management is moving from image acquisition, indexing, storage and retrieval to work flow processes. This transition provides opportunities for hardware infrastructure, software applications and services. In order to support government workflow applications, integration and services, vendors should be familiar with the agency's operations.

Due to several environmental changes that span FY1999, new impetus on support to document management is in place. A sensitivity to document storage and retrieval responsibilities is raised in the face of information technologies that have potential but have not become part of the records manager environments. A definitional question has emerged from the Congress regarding the protection required for e-mail messages as documents, and whether they constitute an official federal record.

f. Electronic Commerce

Electronic Commerce (EC) continues to evolve slowly and is key to the government's ability to provide improved services at lower cost. EC accelerates the accurate interchange of procurement (EDI), logistics (CALS), financial (EFT), benefits (EBT), drawings (EDT), filing (EF) and other data, while improving the accuracy of these transactions. As commercial EC solutions emerge and develop, the emphasis in the federal sector will be in customizing commercial solutions for government use.

EC is moving rapidly to Internet based environments, in large part as an alternative or replacement to the traditional EDI environments. The lower cost Internet environments are attractive as acquisition-based environments. Questions of security and data protection are being addressed in increasingly acceptable methods.

3. Other Applications

Electronic Government has become a collective term reflecting the government's interest in developing a paperless, less expensive operating

environment. Early examples of electronic government grow out of electronic commerce, but other applications, mostly isolated from enterprise programs, are successfully reducing operating costs and removing dependency on paper. Naturally, the Internet is at the heart of these systems.

4. Software Sources

a. Application Development and Maintenance Sources

Research performed by INPUT in 1992 showed that the federal dependence on contractor sources for applications development was heavy. An analysis of 148 FY1995 contract opportunities for applications development showed the same level of contractor dependency as in 1992. In FY1998, the major shift to commercial software products had begun, and it continues to influence overall spending. The interest in commercial products is driven by the need for standard applications, lower development costs, and faster implementation.

The federal government continues to depend heavily on customized applications. Although COTS is growing in popularity, a significant outlay continues for maintenance of existing and new applications. Because the government spends more than 50% of its application software costs for maintenance alone, cost savings can be identified in this market segment.

Unix-based systems and object-oriented systems development tools are gaining in importance because of client server solutions, but over the next two years Microsoft NT environments will replace many Unix-based networks. Similarly, with the emergence of the Internet, Internet/Intranet enabled-applications will increasingly replace more traditional network based applications due to the lower maintenance costs and more rapid development process afforded by web applications.

b. Impact of Technology

There has been quite a shift in focus from 1995 to today, primarily based on the emergence of new technologies, changes in the procurement process and the changing requirements and missions of federal agencies. Following are the most important aspects of IT to users in 1995 and today.

1995:

- Expanded Networks
- Advanced Operating Systems
- Microcomputer Functionality
- Improved Imaging
- Data Center Upgrade

1999:

- Residual Year 2000 Issue
- Expanded Internet Services
- IT Performance - Interoperability
- Network Integration
- Resource Planning

Although many of the concerns for year 2000 date problems are quieted by the aggressive conversions practices of the past two years, some attention on contingency planning survives. The federal government is focusing now more on questions of interoperability, as exposed by Y2K testing.

Sharing of data and information resources is important to agencies faced with reduced operating budgets and demand for improved service. This is especially true now that agencies are operating on a more geographically distributed level. Internet and WAN technology are needed to bridge the geographic gap and allow for the staff to communicate effectively. Internet is used increasingly to support these expanded environments.

An emerging alternative to the Microsoft NT dominance of the small network management environment is Linux, the freeware version of Unix. The appeal for this system is the open software architecture and the robustness that outperforms NT in multiprocessor environments. Though Linux's commercial support is increasing rapidly, it still pales in comparison to the support offered by Windows NT and commercial Unix environments. This will be a significant hurdle for the proliferation of Linux in the federal and commercial marketplace.

F
Conclusions

All of these trends (program budget issues, new technology, refined mission requirements, agency restructuring, new procurement rules) will impact the federal IT market over the next five years. Chapter 4 discusses the extent to which each submarket is impacted and Chapter 5 highlights the impact on agencies. One thing remains certain: agencies have accepted the need for IT as a core process enabler. It is not just a support function anymore. IT must now be incorporated into the business process if agencies are to accomplish their missions.

IV

Market Forecast and Trends

INPUT dissects the federal IT budget elements and recombines them into convenient industry terms. The first reassembling provides an overall perspective of that portion of the IT budget spent on contracts for systems and services. In the remainder of this chapter, INPUT provides forecasts and discusses trends of the individual delivery modes within the IT systems and services portion, as defined in Appendix B.

A
Overall Federal IT Market

The overall market planned for federal acquisition of information systems and services in FY1999 is $26.1 billion, forecast to reach $34.0 billion in FY2004. This represents a compound annual growth rate (CAGR) of 5.4%, as shown in Exhibit IV-1.

The current Administration continues to believe that IT holds the key to improved service. Benefits are already visible as overall government spending is reduced, and a budget surplus has been identified. However, in the absence of cost savings or improved performance at the program level, Congress may withhold budgetary support to large IT-based programs. Such scaling back is already evident in tax system modernization spending.

The largest component of the addressable information systems and services market in recent years has been commercial services. The government reported spending $9.7 billion on commercial services in FY1999. The budget request for FY2000 is $10.1 billion, with gradual increases in expenditures through FY2004 expected. This market segment is expected to grow at a 6.8% CAGR to $13.5 billion in FY2004. Commercial services include professional services, processing services, outsourcing and maintenance. Current agency long-range plans, along with downsizing and outsourcing trends, indicate a continuing need for industry operational support, despite program cancellations and the government's efforts to consolidate computing resources.

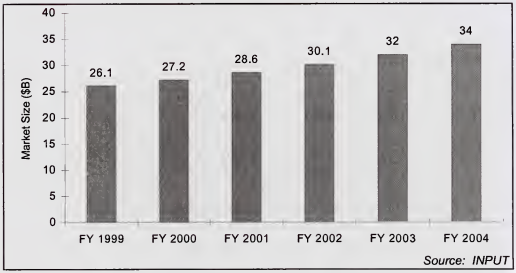
Prospects for computer systems spending growth have diminished since last year, when the 5-year CAGR was 5.3%. Dollar volumes will rise through FY2004 at an increased compound annual growth rate of only 4.6%. Computer systems are not the largest IT component as it was in the past. Computer systems include hardware and software products, turnkey systems and major equipment additions and replacements.

Long distance data transfer over the Internet continues to have great impact on spending levels in the telecommunications sector. The communications segment includes circuit/time charges under FTS2000 and FTS2001 contracts, network services and customer-premise equipment. INPUT expects these services to increase from $7.1 billion in FY1999 to $8.9 billion in FY2004. Although the 5-year CAGR of 4.7% seems low for this category, the precipitous decline in telephone rates brought on by intense competition adds to the value of this market in terms of increased telecommunications use. The forecast includes procurement of a number of dedicated data networks and increasing digitization and network connectivity, but at decreasing tariffs.

The telecommunications market potential may be a great deal larger than spending levels currently reported by agencies. In addition to inaccurate reporting of telephone charges, other data transfer charges over circuits, especially through Internet, inaccurately report telecom expenses. The telecom segment in Exhibit IV-1 reflects only reported requirements.

Exhibit IV-1

Total Addressable Federal Market

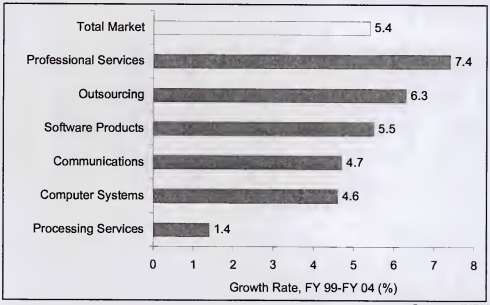


The expenditures shown in Exhibit IV-1 are based on those requested by the agencies in their A11, Exhibit 42 reports.

Overall, the professional services segment will exhibit the most growth over the next five years. As agencies reengineer their business processes, distribute their operating environments and consider enterprise applications, professional services will be increasingly required. Outsourcing is also expected to play an increasingly significant role in the market. As contracts for desktop services such as Seat Management and ODIN take hold and agencies react to a more "outsourcing friendly" political environment, outsourcing will become key to accomplishing mission objectives. Market segment growth rates for the federal IT market are shown in Exhibit IV-2.

Exhibit IV-2

Federal Market Segment Growth Rates, FY1999–FY2004



Source: INPUT

B
Professional Services

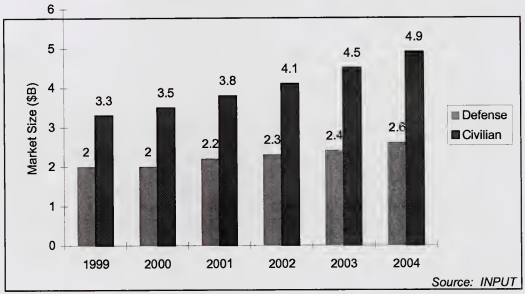
The professional services segment includes consulting, design, education and training, and software development as well as the professional services associated with systems integration.

The federal professional services market is growing at an increasing rate. The transition to contractor sources for services is well underway, but threats to reduce program spending levels overall can influence this market. This market is projected to increase to $7.5 billion by FY2004, at a CAGR of 7.4%, retaining constant growth over the past five years, but significantly below the 13% level of FY1988. See Exhibit IV-3.

The projected need for contractor assistance makes the federal government the largest user group for professional services in the U.S. If systems integration professional services are excluded, the basic professional services market represents a growth from $3.8 billion in FY1999 to $5.3 billion in FY2004 at a CAGR of 7.3%. This indicates a decline in the use of systems integration services by government agencies.

Exhibit IV-3

Total Professional Services Market

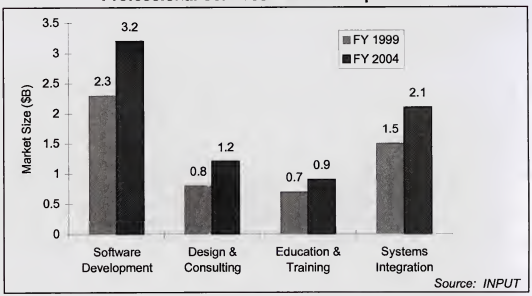


Source: INPUT

The relationship between the distributed modes of the professional services market is illustrated in Exhibit IV-4.

Exhibit IV-4

Professional Services Market Components



Source: INPUT

The growth rates of the basic services submarket, shown in Exhibit IV-4, composed of software development, design and consulting, and education/training, make up the largest growth segment of the professional services market. The growth rate for civilian agencies is all the more impressive given that it starts with the largest numbers.

This year's higher CAGR forecast of 7.4% reflects renewed demands for services to address year 2000 failure contingencies and modifications in systems to establish interoperability. The systems integration component continues to grow in spite of smaller contracts and commercial product purchasing. As the government shifts fulfillment of services requirements from large integration contracts to smaller task order activities, increasingly government program offices are the role of the integrator.

1. Software Development

Software development is forecast to grow from $2.3 billion in FY1999 to $3.2 billion in FY2004 at a CAGR of 7.5%, as shown in Exhibit IV-4. This is the same as last year's forecast, but it continues to represent a dependency on outside resources for software development. This dependency will continue through the out-years.

The software development submarket includes:

- Hardware and/or software system design
- Custom software development
- Modification of commercial software products
- Software testing of custom and commercial packages
- Software conversion
- Maintenance of custom applications software
- Independent verification and validation of software packages prepared by other vendors.

The declining availability of programming skills in the federal government is the most significant factor behind the projected growth. Government staffing limits and the backlog of software maintenance tasks at most government data centers contribute to the demand for vendor assistance in this service mode. The development of contingency processing for Y2K fallout and interoperating, interagency environments will keep this a healthy market.

Interoperability pressure (more specifically the ability to exchange data) is the driving force behind the use of contractors in software development. Vendors can more readily provide the expertise needed to knit together different platforms and their applications software to accelerate data interchange.

2. Design and Consulting

IT consulting services in the federal market will grow at a CAGR of 7.3%, from about $807 million in FY1999 to $1.2 billion in FY2004. The defense growth forecast five years ago was depressed by the slowdown in CIM/DISA initiatives, but renewal of systems engineering and development activity for Y2K remediation, plus the continuing shortfall of systems experts in the federal workforce, may turn the low defense growth rate around.

The types of services contracted include:

- Feasibility studies
- ADP requirements analyses
- Systems audits
- Systems engineering and technical direction (SETD)
- Systems engineering and technical assistance (SETA)
- Software engineering and technical assistance.

The primary demand factor is the need among agencies for assistance in producing the technical justification for planned improvements in information technology resources. Agencies are understaffed in the technical planning and evaluation areas.

In the past, Congressional pressure was exerted on agencies to minimize the use of outsiders (and previous government employees) in functions perceived as governmental management. This is no longer an issue. Government agencies are encouraged to rely more on outsourcing services, even in the area of acquisition support.

3. Education and Training

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

The government normally contracts for the following separately from systems integration programs:

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

In previous years, this delivery mode eroded under both budget pressures and inclusion of the services in systems integration programs.

The demand existed for training and education, but stretched IT budgets compromised the training component. Agency officials sought funding for training elsewhere, usually from within operating budgets. This submarket is recovering in response to acknowledged demands from the user community for educational services. The user demand grew from implementation of new software, tools and sophisticated hardware. In addition, the Information Technology Management Reform Act (Clinger-Cohen) mandates the development of training programs to equip IT users throughout the organization with IT skills.

Some agencies, notably Social Security Administration, NASA, and Department of Energy have set up nation-wide training programs through video teleconferencing in order to reduce outlays for travel and temporary duty away from the office. These training expenses appear under systems development rather than education. All military services have implemented computer based training programs that use the Internet for interactive learning.

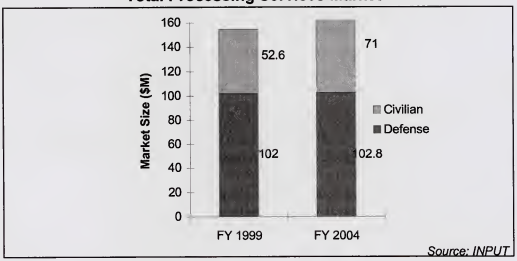
The forecast in previous years has been for no growth, maintaining current levels of annual spending. However, with the move toward distributed operating environments, business process reengineering, the introduction of enterprise applications and network operations, the training demand is pushing this submarket upward relative to other market segments. From an artificially depressed level of $400 million in FY1994, the market is expected to grow from $684 million in FY1999 to $949 million in FY2004 at a CAGR of 6.8%. This level is higher than the overall growth rate for IT.

C
Processing Services

Processing services includes transaction processing with some batch-mode workloads. For the last half of the decade of the 1980s, this delivery mode continued to decline in real dollars as installation of new distributed processing systems and desktop processors depressed the need for outside processing support. Exhibit IV-5 shows the "no growth" state of this market.

Exhibit IV-5

Total Processing Services Market



Source: INPUT

1. Transaction Processing

Transaction processing, previously called remote computing services (RCS) and until this year identified as ADPE time in the federal IT budget, has continued to decline since FY1984, when growth was projected at 13%. Transaction processing is lower now than in the 1980s, but remains active for agencies still waiting for new facilities. Many of the larger federal data centers continue to add capacity and take on processing for other agencies to partially justify their own operating expense.

The level of $155 million in FY1999 is an increase from $118 million reported in FY1996, but this category will not hold this level in the near future. FY2004 spending is forecast at $139 million

Network services were separated from this delivery mode in 1989 and are now included with the communications market forecast.

2. Utility and Batch Processing

Small amounts of utility and batch processing continue to appear in agency IT expenditures, but have declined to about $30 million per year. The bulk of this work appears in DoD budgets. FY1998 saw a decline, but slight increases are expected over the next five years to $35 million in FY2004.

Continued budget-deficit reduction actions that delay implementation of upgraded systems stimulate this market beyond levels previously predicted, to meet agency productivity goals and mission objectives. This could support vendor-supplied disaster recovery systems, if the agencies cannot install equipment to satisfy their needs. Utilities are also a form of ADP insurance for agencies with marginal processing capacity.

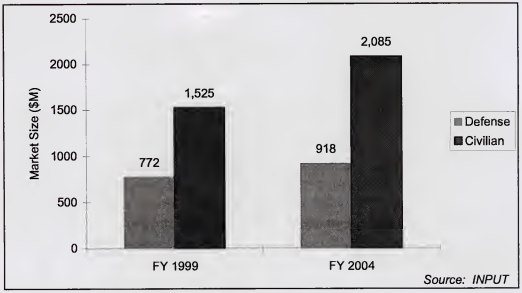
D
Software Products

As shown in Exhibit IV-6, the federal software products market is expected to increase from $2.3 billion in FY1999 to $3.0 billion in FY2004 at a compound annual growth rate of 5.5%. This is less than the 17% forecast in 1989 and 13% in 1990, partly because of competitive pricing and the impact of requirements contracts that specify the application packages be furnished in quantity. This is a slowdown over last year's growth because of the push for commercial products rather than developmental software.

The software products market is being driven by the availability of commercial, shrink-wrapped applications. This, in itself, could result in lower levels of spending for the same level of software support. However, agencies may be overly optimistic that commercial products will be available and may actually spend more than planned on development. An additional downward market driver is software licensing. This contract condition allows an agency to purchase single copies of products and copy them for distribution to multiple installations.

Exhibit IV-6

Total Software Products Market



1. Application Software

INPUT divides the software products market into applications and systems. Applications software includes accounting, human resources, procurement and mission-unique support software. This latter category concerns software that directly supports the mission of the agency. The following examples are typical:

- IRS uses software to assess the audit of a taxpayer's return.
- The Defense Logistics Agency (DLA) uses software to track the movement of supplies at depots and warehouses.
- NASA uses software to evaluate the usability of pictures transmitted from space.

Applications software outlays are driven by the large desktop installed base and updates of existing software residing on platforms ranging from PCs to mainframe. Price competition is considered the key factor, but the shortening of software upgrade cycles increases the demand for new products. The increased CAGR of 5.5% over the 3% to 4% CAGR of prior years reflects comparable growth in this segment, but is still far below the 15% CAGR in 1990. The market is expected to increase from about $1.5 billion in FY1999 to $2.0 billion by FY2004.

As a result of budget constraints and heavy pressure from OMB, many agencies are beginning to view their software requirements in other than developmental terms. When they have a fairly standard application, particularly an administrative application, they acquire standard

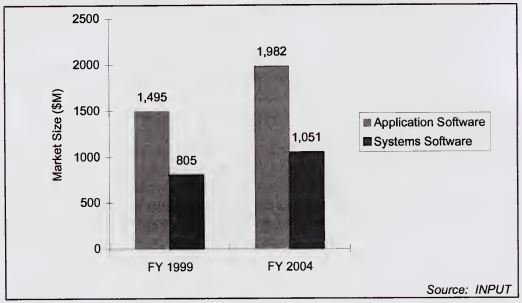
commercial packages more often than before. This leads vendors to increase development of packages that are suitable for government use and government-oriented marketing efforts. Commercial software products can be purchased at volume discounts as part of "application suites," or purchased centrally with rights to copy. Many of these COTS applications still require a degree of support, however. This move toward "customized COTS" is expected to continue over the next five years.

2. Systems Software

Systems software usually is sold or leased with the hardware. Purchases that follow initial hardware installation include DBMS, compiler controls, accounting and charge-back software, communications and software development tools. Recent price reductions and increased competition in this market are holding down growth rates. Unbundling of systems software from hardware platforms will make some of these products more visible because they would be priced separately. The Department of Justice's pressure on Microsoft Corp. emphasized the need to unbundle operating system and support software for desktop processors and LANs. DOJ's pursuit of the Microsoft dominance also carries a concern that the lack of competitive operating environments may prevent lower prices and truly open environments. As a result, the software products market will show artificial signs of growth through FY2004. Software product submarkets are shown in Exhibit IV-7.

Exhibit IV-7

Software Products Market Components



Source: INPUT

E
Systems Integration

The market for systems integration (SI) is expected to increase at a 5.6% CAGR, from $4.8 billion in FY1999 to $6.3 billion in FY2004, as shown in Exhibit IV-8. The SI market is not growing as fast as most observers anticipated in 1991, but because of the professional services segment, it is still one of the healthiest IT segments in the federal government. Growth rates for each of the product components have held steady over the last several years.

Unlike the commercial markets, hardware outlays are the predominant investment. The hardware segment was holding at 55% in recent years, but fell to 53% in FY1999. With the growth in the professional services segment, it is expected to fall to 51% through FY2004.

Hardware systems represent the largest dollar outlay in the systems integration market. As agencies move toward commercial software and upgrade existing commercial software systems, the software products component of the systems integration forecast shows a similar growth rate. The equipment portion of SI was flat in the late 1980s, reflecting sizable budget cuts at many agencies, especially on the defense side. But beginning in FY 1991 and continuing through FY1996, there was a sizable increase in equipment acquisitions, replacing older mainframes and incorporating large numbers of workstations and PCs.

For FY1999, civilian SI spending exceeds that of defense by approximately $1.4 billion. The difference reflects current budget constraints in DoD, but the decline in difference signals that there will be a turnaround in DoD spending for integration. INPUT expects these constraints to continue throughout the forecast period, largely driven by OSD plans to reduce defense systems spending, and continued pressure on the budget by the House Appropriations Committee. The Senate appears willing to continue a high investment in defense information technology spending. For 1999, DoD expects to spend a modest $11.4 billion on information technology, but the Senate has indicated a willingness to invest additional funds for modernization.

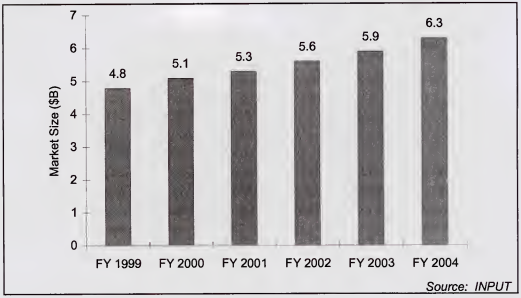
Not all major SI initiatives are being canceled; some may be deferred or extended. Major SI efforts in civilian agencies are being cut back. As a result, the defense market will continue to hold ground to the civilian market demand over the next few years.

Most SI projects include provisions for communications. With the advent of FTS2000, and follow-on FTS2001, estimating cost for SI projects became difficult. It is further compounded as the Internet becomes more widely used as a communications medium.

Risk management is heavily emphasized in the federal market. Despite system complexity, the agencies want functional solutions—not just the offering of sophisticated, interesting technology. Caution must be tempered by provisions for technology insertion (for instance, imaging systems) in the future.

Exhibit IV-8

Total Systems Integration Market



Source: INPUT

1. Hardware Products

Earlier, the amount spent on equipment in a particular project declined as a percentage of the overall project cost. The reduction was attributed to the progressive decrease in the cost-per-MIPS. But since 1990, the amount has risen as the projects include more terminals/PCs for users and extensive networking is needed.

Expenditures will rise to $3.2 billion in FY 2004, at a CAGR of 4.5%. More of the CPUs originally planned for reuse have become obsolete and need replacement. LANs and network equipment also are adding to the rise in hardware costs.

A major influence on the hardware products market is the year 2000 problem that has forced many agencies to update their systems through renovation or replacement.

2. Software Products

The size and growth rate of the software products component of SI is essentially unchanged since the 1991 forecast. Outlays are growing at a 5.3% CAGR to an anticipated level of $620 million in FY 2004. Certainly, part of the unchanged spending profile stems from the increased use of commercial microcomputer application products, which although growing, have undergone substantial price reductions.

Another growth factor is the continuing conversion of existing applications to minimize delays in cutting over to new systems. A significant problem in creating new systems from old ones is the matter of site licenses and restricted use of commercial, copyrighted software.

3. Professional Services

Professional services grew at 17% per year from FY1987 to FY1989, but dropped to 15% in FY1990. Increases are expected in this segment. Continued delays in spending for several DoD systems and problems with Treasury programs account for most of the shortfalls since FY1994. FY 2004 outlays now are expected to reach $2.2 billion.

In FY1998, outlays for professional services were 32% of the total spent for SI. The proportion will increase by 34% for FY2004.

The services included in this market are:

- Project management
- Consulting services
- Design services
- Integration services
- Custom software development
- Education and training
- Documentation
- Operation and maintenance (systems operations—only if specified in the contract).

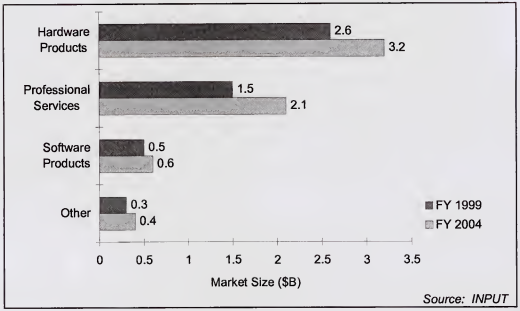
4. Other

The "other services" category, although relatively small in the federal market compared to the commercial market, includes transaction processing and network services during the implementation phase, site preparation, mechanical engineering and initial data processing supplies. This segment is expected to grow at a 5.1% CAGR.

Exhibit IV-9 shows the subsegments of the systems integration market.

Exhibit IV-9

Systems Integration Market Components

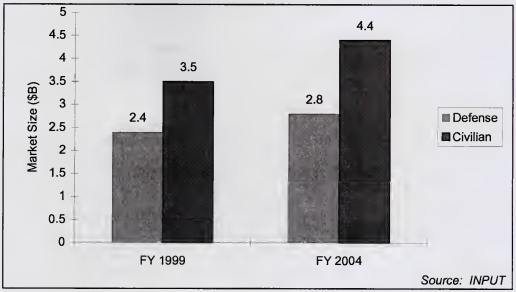


Source: INPUT

F
Computer Hardware

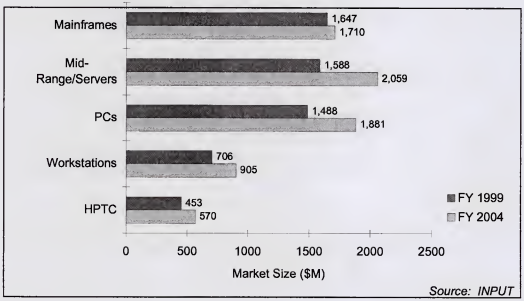
INPUT focuses on the information services industry and does not treat computer hardware as an independent research area, except for the components of systems integration and turnkey systems delivery modes. Federal vendor client interest in equipment, including PCs and office information systems, led to the preparation of several equipment-oriented reports and a forecast of likely trends, beginning in 1988. The federal computer hardware market is shown in Exhibit IV-10. This component represents core hardware without any operating system or maintenance.

Exhibit IV-10



The subsegments of the computer hardware market are shown in Exhibit IV-11.

Exhibit IV-11



1. Mainframes

The mainframe market will experience negative growth over the next five years. Agencies will still rely on the technology, but the uses of mainframes will become more specialized and agency-specific. Spending will continue but will decrease from year to year. Some agencies are currently considering the compatibility of mainframes with Enterprise Resource Planning software.

Mainframes of the IBM 390 and Unisys 2200 class are being replaced largely because they have become too expensive to maintain. Older IBM 370 and Unisys 1100 class processors are not maintainable. More modern architectures off-load overhead functions from the mainframe to networked workstations, permitting the mainframes to operate at or near designed transaction speeds. Furthermore, higher performance replacement programs of the late 1980s moved onto both higher capacity mainframes or minicomputer-based distributed systems.

INPUT has revised this market segment from the 1997 forecast by removing high performance technical computers and placing them in a separate category. This accounts for the discrepancy in reconciliation.

2. PCs

Over the last few years, the versatility and functionality of the desktop PC has increased tremendously. As a result, agencies have become dependent on the technology. The trend is expected to continue over the next five years.

Currently, vehicles such as Seat Management and ODIN are challenging the way in which PCs have been traditionally procured and maintained. These contracts treat the PC as part of a utility that is geared toward the completion of a mission function. This trend is expected to continue and could revolutionize the way PCs are bought in the federal government.

3. Workstations

Workstations are single-user platforms designed to accomplish more specialized functions that a PC cannot perform as well. This market boomed in the federal government in the last decade as the technology became more versatile and cost-efficient. Unix has been the operating system of choice for many years. However, the advent of Microsoft's Windows NT has presented another feasible option in the systems software area. The popularity of NT as an operating system is increasing and that trend is expected to continue. The only threat to NT dominance is the Linux UNIX derivative that has open architecture and increased functionality in high performance environments than the NT alternative.

4. Servers/Mid-Range

Servers are multi-user platforms which usually perform central file server functions on a local area network (LAN). As the processing power of PC and Unix based systems has increased, the uses of these systems and the uses of mid-range systems have merged. Consequently, INPUT has combined the mid-range and server systems in one category. As federal agencies decentralize, the importance of servers has grown. They now handle internet protocols in conjunction with routers and hubs as well as keeping organizations bridged over wide area networks (WANs). As the need to communicate over long distances remains, servers will play an important role in federal organizations. They are also emerging as an application server environment for database management and enterprise applications.

5. High Performance Technical Computers

Traditionally, federal agencies have used supercomputers for highly scientific and technical applications. NASA and the Department of Energy own the bulk of these systems, but major DoD agencies and a few civilian agencies also have supercomputers installed in both classified and unclassified establishments.

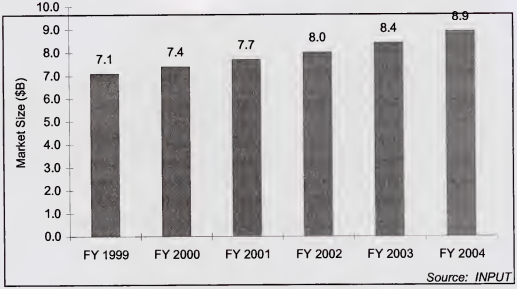
Federal computing is becoming more complex. INPUT expects agencies to find new applications for supercomputers based on NII activity, thus fueling continued market growth.

G
Communications and Network Services

As agencies reorganize with a downsized workforce and become more geographically diverse, more emphasis is placed on the need to communicate through the use of technology. The communications and network services market will play a key role in the realm of federal IT. The market for communications and network services is shown in Exhibit IV-12.

Exhibit IV-12

Total Communications and Network Services Market



Source: INPUT

1. Leased Circuits

Leased circuit expenditures are expected to grow from $3.7 billion in FY1999 to $4.6 billion in FY2004, at a CAGR of 4.3%. INPUT assumes that many local telephone service leases are buried in administrative funds.

2. Professional Services

Professional services and equipment (hardware) are small in comparison to the media costs. However, healthy growth is expected in telecommunications professional services as the need for network integration and network security develops. Professional services is likely to increase from $837 million in FY1999 to about $1.2 billion in FY2004. Its growth will be significant, however at a CAGR of 7.0%

3. Network Services

Network services is divided into two major segments: electronic information services--selling information to users--and network applications--enhanced transport of user information processing needs. In FY1996, OMB relaxed its reporting requirement to separate out leased circuit spending from other communications categories. This year (FY1999), there is no specific reporting of any telecommunication costs.

The network services market will grow at a CAGR of 4.4% over the next five years. This market size includes the government's use of services such as America Online as well as online resources such as Lexis/Nexis.

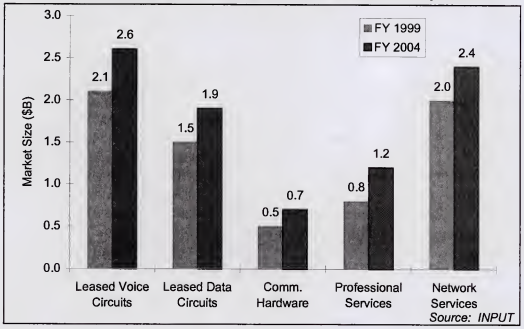
4. Communications Hardware

Equipment outlays, largely CPE (Customer Premise Equipment) and ASP (Aggregated Switch Procurements), are nearly $549 million in FY1999. Spending is expected to increase to $667 million in FY2004 at a 4.0% CAGR. Agencies are adding new equipment to their networks to accommodate the need for faster data transfer and improved services. This market segment includes routers, hubs and bridges, whose importance has increased with demand for distributed environments and Internet access.

The distribution of spending across the various segments of the federal market for telecommunications is presented in Exhibit 13.

Exhibit IV-13

Communications and Network Services Market Components



Source: INPUT

H
Outsourcing

The outsourcing modes defined by INPUT include platform operations, application operations and management, desktop services, network management, and business operations. For a more detailed explanation of these categories, see Appendix B.

As noted in Exhibit IV-14, federal outsourcing expenditures are $2.1 billion in FY1999 and are expected to grow to $2.9 billion in FY2004. The compound annual growth rate of 6.3% has increased slightly since the FY1994 forecast but is not expected again to reach the 15% level predicted in 1989, unless applications are outsourced at greater levels than currently identified by agencies. This outsourcing would have to be accompanied by a significant increase in overall IT spending levels.

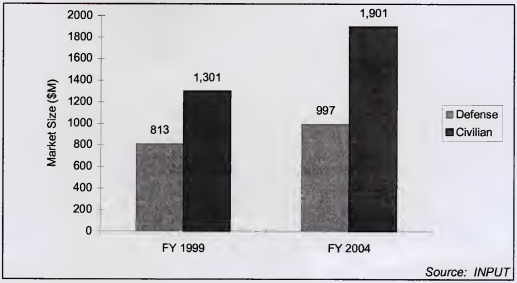
The federal outsourcing market is currently one of the fastest growing services segments of the overall federal IT market. Many factors are influencing this growth but the most influential is the Administration's mandate that all functions which cannot be time and cost-effectively performed by in-house personnel should be outsourced.

This has led to some controversy over the last few years about the actual entities to which the government should outsource. Most logically, the government would outsource non-mission-critical functions to private sector vendors. However, some agencies have the capability to perform the same work that a vendor could perform. In its award of the ICEMAN contract, the Federal Aviation Administration set a precedent by awarding its data center operations contract to another government agency, the Department of Agriculture. USDA had the excess capacity to be able to take on the operation of the data center without impacting its own mission requirements. Critics argue, to this day, that agencies with excess capacity should be downsized. This would leave no room for external projects, such as those at other agencies. Vendors feel that this causes unfair advantage because the government is not subject to the same rules of competition and may also offer a naturally lower price. This award sparked a legislative controversy that still continues today. It is safe to say, however, that the outsourcing of IT functions will continue to play a major part in the federal marketplace.

As is normally the case in the federal IT services markets, the civilian sector is expected to experience more rapid growth than the defense sector. This is also influenced by some of the large-scale outsourcing projects currently under way at civilian agencies such as GSA's Seat Management program, NASA's ODIN project, and NASA's CSOC initiative. The civilian sector is expected to grow from $1.3 billion in FY 1999 to $1.9 billion in FY 2004 at a CAGR of 7.9% over the five-year period. On the defense side, the outsourcing market will grow at a 4.2% CAGR from $0.8 billion in FY 1999 to $1.0 billion in FY 2004. Outsourcing still represents one of the fastest growing IT market segments on the defense side.

Exhibit IV-14

Total Outsourcing Market



Source: INPUT

Federal outsourcing began to grow again in FY1990, after experiencing lower CAGRs of 6% to 8% since the cutbacks of FY1983, when a number of new systems were implemented. The turnaround began with staffing restrictions, a slowdown of new system acquisitions imposed by the Gramm-Rudman-Hollings Budget Control Act, a slowdown in Defense spending, and a more "outsourcing friendly" political environment.

1. Platform Operations

Historically, one of the largest segments of the outsourcing market has been platform operations. This includes many of the services that are performed in data center outsourcing contracts. This segment is expected to remain large, as the contract values for platform operations work tends to be high. The growth in this segment is slowing and has been for the past few years as agencies have downsized and reorganized and new technologies have lessened the need for agency-wide data center operations. Also, the Administration's call for government-wide data center consolidation has reduced the total number of federal data centers and increased the centralization of mainframe processing capacity in the remaining data centers.

There are still significant awards in the area of platform operations, however. The Air Force awarded a contract in May 1998 to TRW for systems operations, including platform operations. The contract has a potential value of $78 million. The overall market for platform operations in the federal market is expected to grow from $561 million in FY 1999 to $759 million in FY 2004, at a CAGR of 6.3% over the period.

2. Applications Operations and Management

The applications management and operations market has also been one of historical significance. It has been one of the largest segments of the outsourcing market for years. The applications operations and management market is expected to grow at a CAGR of 6.3% over the next five years; reaching $1.4 billion by FY 2004. Many factors influence this growth. First, agencies are implementing new applications as a result of the year 2000 problem, which require contractor assistance to operate and maintain. Also, new enterprise applications are springing up across the government which require a high degree of support, especially at those agencies with small IT support staffs. Finally, the move to Windows NT environments and the easing of procurement regulation have sparked buying in the COTS application area. Contractors who are familiar with these applications are constantly being called upon to assist agencies with their operation and upkeep.

One such example is the contract that the Defense Supply Service - Washington awarded in conjunction with the Information Management Center - Pentagon in December 1998 to Computer Technologies Inc. The $2.2 million contract includes maintenance and modification of the existing RAMPARTS software application. RAMPARTS assists the Army in responding in a timely manner to the rapidly changing national and international environments.

3. Desktop Services

Desktop services is one of the fastest growing areas of the outsourcing market. The Seat Management and ODIN contracts are among the forerunners in vehicles for this type of work. If and when these vehicles take hold, they will have a tremendous impact on the way the federal government acquires PC computers and software. The success of desktop services is, to a large extent, contingent on the success of the Seat Management and ODIN contracts. Many agencies are taking a "wait and see" attitude toward this type of work until some results are generated from current projects.

This market segment also includes call center and help desk functions that are currently being implemented at some agencies. The Department of Transportation's Research and Special Programs Administration (RSPA) has a contract with Alphatech for local area network (LAN) and help desk support services. This contract, awarded in May 1998, has a potential value of $3.5 million.

The federal market for desktop services is expected to increase from $222 million in FY 1999 to $307 million in FY 2004, at a CAGR of 6.7%, making this the fastest growing segment in the federal IT market.

4. Network Management

As agencies begin to conduct more business electronically, namely through the use of Internet/Intranet technologies, network management became more important. The federal market for outsourced network management services is expected to reach $391 million by FY 2004, growing at a CAGR of 6.2% over the next five years.

In May 1998, the Air Force awarded a contract to BD Systems for an estimated $21 million. This contract calls for a host of services including management of the networks at Peterson AFB, CO. This contract, known as PACMAN, is one example of the government's need for contractor support in the network management area. This represents a growing trend that will make network management a growth area well into the future.

5. Business Operations

Many agencies are still reluctant to consider outsourcing an entire business function to a contractor. Reluctance results from many issues, most important of which is a perceived loss of jobs on the part of federal employees. The concept, however, remains important. After many agencies downsized and the year 2000 problem came to fruition, many agencies found themselves with IT staffs that were too small to accomplish its mission in a time and cost-effective way.

Agencies began to look to outsourcing all or part of an IT function to a contractor, such as Lockheed Martin's contract with NASA. This contract, known as the Consolidated Space Operations Contract (CSOC) is a $3.4 billion endeavor in which Lockheed Martin and its team will satisfy NASA's requirements for mission and data service elements to provide space operation services at four NASA centers with options for a fifth center. The centers included are JPL, GSFC, MSFC, JSC and KSC. Services under the contract include: data acquisition from spacecraft, data transmission to end-users, data processing and storage, trajectory data processing and navigation analysis and mission control center operations. The IT-related portion of the business operations segment is expected to reach $113 million in FY 2004, growing at a five-year CAGR of 6.3%.

I
Year 2000

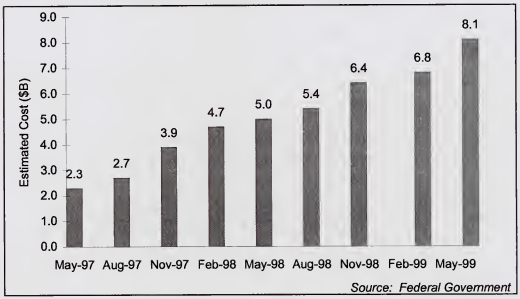
The most public IT problem facing federal agencies, and all other commercial businesses today has been the year 2000 problem. Agencies were slow to react to the issue initially, but scrambled during 1998 and early 1999 to make up for lost time. The problem presented a huge

opportunity for vendors – including those with no Y2K offerings, but not all vendors have benefited from the opportunity. Many agencies took management of the solution through various contracts already in place or through Independent Verification & Validation contracts. The government personnel dedicated to the problem left a void in their normal IT support functions. Continued diligence to Y2K interoperability requirements continues potential for software support vendors.

The government cost estimates are shown in Exhibit IV-15. INPUT expects the problem to cost the government $10.9 billion to fix, with $8.1 billion spent externally.

Exhibit IV-15

Progression of Federal Y2K Cost Estimates



Source: Federal Government

Agencies estimated in November 1998 that they would spend $6.4 billion fixing the problem from fiscal year 1996 through fiscal year 2000, an increase from the August 1998 estimate of $5.4 billion. Agencies estimated in March 1999 that they would spend $6.8 billion fixing the problem from Fiscal Year 1996 through Fiscal Year 2000. Agencies now estimate (June 1999) that they will spend $8.05 billion fixing the problem from Fiscal Year 1996 through Fiscal Year 2000, up from $6.75 billion reported in February 1999.

J
Electronic Commerce

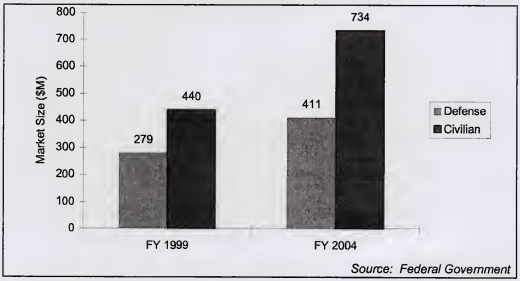
With federal IT spending constrained by federal budget limitations, few segments of the federal IT market achieve double-digit growth. One such segment, the federal market for Electronic Commerce, will see growth of

10% from 1999 to 2004. Federal spending on Electronic Commerce related systems, software and services is estimated at $719 million in 1999. INPUT expects it to reach $1.1 billion by 2004 as agencies increasingly do business over the Internet. The forecast for the federal market for Electronic Commerce is displayed in Exhibit IV-16.

There has been a flurry of activity across the federal government in areas such as digital commerce, inventory control, asset and financial management and information portals that fall under the electronic commerce umbrella. This trend is expected to continue as agencies embrace the Internet as a way of sharing and communicating data internally, across agencies and with vendors.

Exhibit IV-16

Total Electronic Commerce Market



Source: Federal Government

V

Agency Forecasts

INPUT forecasts information technology budgets by agency based on spending in obligations as reported to OMB. However, the current Circular A-11 Exhibit 42 does not require agencies to report detailed spending on the reported categories. Currently, only three spending categories and a total is reported for each agency.

- IT Systems by Mission Area
- IT Infrastructure & Office Automation
- IT Architecture and Planning
- IT Resources Summary

To estimate current and potential future agency spending by specific delivery modes, INPUT analyzes historical spending patterns by agency and considers existing and projected market trends that may affect spending across the reported OMB categories. Based on these analyses, comprehensive budget forecasts and program trends are provided below for those agencies — both civilian and Defense — with leading expenditures in information technology products and services.

A
Agency Overview

Spending in all categories of information technology varies widely by agency. However, the growth rate of each category relative to the overall information technology budget for each agency remains the same from year to year, as a rule. Overall, these agencies are expected to maintain their rankings through FY2004. As usual, the Office of the Secretary of Defense, which includes the Defense Information Systems Agency (DISA), will spend the most on IT resources.

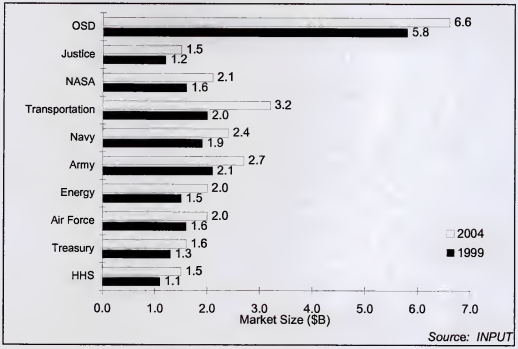
Agencies throughout the federal government are forced to do more with tightened program budgets. This fact, coupled with the advent of information technology management reform and rapid technological change, ensures that information technology spending will continue as an enabler of improved program performance. Exhibit V-1 highlights the growth in the addressable portion of the IT market for each of the top 10 contracting agencies through FY2004. This ranking does not take the cost of internal supplies and personnel into consideration. Spending estimates are those dollars available to contractors. In the past, when looking at the General Services Administration, consideration had to be given to the fact that a large portion of its contracting was done for other agencies – with GSA acting only as a "pass-through." That changed for FY2000.

Overall, the addressable portion of the IT market is expected to grow at a faster rate than the total IT market, highlighting the trend toward outsourcing. As new ways of outsourcing are explored, this trend will continue.

For 2000, there were some changes in the composition of the top ten agencies, as shown in Exhibit V-1. General Services Administration disappeared from the list because it no longer reports funds that other agencies give for government-wide services such as FTS2001. This made room for Justice to enter the list.

Exhibit V-1

Addressable IT Budget by Agency, FY1999–FY2004



Source: INPUT

B
Leading Agencies (Addressable IT Budgets)

Based on INPUT's analysis of agency budget submissions to OMB and historical spending trends, this section summarizes contract dollars budgeted for FY2000, with compound annual growth rates from FY1999 to FY2004.

The agencies discussed in greater detail on the following pages represent the top 10 agencies in terms of the addressable portions of their IT budgets.

1. Office of the Secretary of Defense

Estimated spending on information technology products and services by the Office of the Secretary of Defense (OSD) in FY1999 comprised 51% of the total DOD IT budget, and is expected to decline further to 48% in FY2004. This drop is at the expense of increased spending budgets for the services as DOD centralization relaxed. OSD funding consists of all Defense administrative agencies' budgets (excluding the Air Force, Army, Navy and the U.S. Marine Corps), such as the Defense Information Systems Agency (DISA) and the Defense Finance and Accounting Service (DFAS), to name two. As with the military services, growth in IT expenditures at OSD is expected to be minimal over the next five years due to continuing overall program budget reductions.

The CAGR for IT spending in OSD is 2.6% from FY1999 to FY2004, with the primary submarket growth driver being commercial services (CAGR 3.1%). It is likely that commercial services will receive more funds in the near future because Defense agencies are coming to realize that spending on IT systems is not enough without the ability to utilize them effectively. Even with relatively low growth, OSD is expected to maintain the lead in spending among all DOD components well into the next century.

Compared with the military services of the Department of Defense, OSD historically appropriates a higher percentage of its total IT budget for commercial services. In FY1999, 29.2% of its IT spending went to commercial services. It is expected to reach 29.9% in FY2004. The addressable IT budget of the Office of the Secretary of Defense by IT category is presented in Exhibit V-2.

Exhibit V-2

Addressable Portion of the IT Budget of the Office of the Secretary of Defense

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	2,681	2,659	2,728	2,825	2,927	3,047	2.6%
Computer Systems	1,451	1,443	1,459	1,495	1,546	1,606	2.1%
Commercial Services	1,705	1,625	1,697	1,777	1,873	1,984	3.1%
Total Addressable IT Budget	**5,837**	**5,707**	**5,884**	**6,097**	**6,346**	**6,637**	**2.6%**

Source: INPUT

2. Department of Transportation

The Department of Transportation proposed $2.0 billion for information technology products and services in its FY1999 budget. This budget is forecast to grow to $3.2 billion in FY2004 at a CAGR of 10.7%. Although all segments of spending will grow at higher than average rates, computer systems spending is significantly higher in this agency than in others. The largest segment of IT spending at Transportation, as is the case for most other agencies, is for commercial services, growing at a CAGR of 17.2% over the next five years.

Driving the market for commercial services will be software development, design and consulting. Also, IT spending by DOT is enhanced with the development of new air traffic management systems, currently a major initiative at FAA. Projected expenditures on IT products and services at the Department of Transportation are provided in Exhibit V-3.

Exhibit V-3

Addressable Portion of the IT Budget of Department of Transportation

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	474	619	650	683	725	769	10.2%
Computer Systems	1,257	1,439	1,513	1,591	1,688	1,792	7.4%
Commercial Services	226	493	532	576	628	687	24.9%
Total Addressable IT Budget	**1,958**	**2,551**	**2,695**	**2,850**	**3,041**	**3,249**	**10.7%**

Source: INPUT

3. Department of the Army

The Department of the Army is the third largest IT spender within the federal government, a higher position than it has occupied for several years. It spent roughly $2.0 billion for information technology products and services in FY1999. This figure is expected to reach $2.7 billion in FY2004 at a CAGR of 5.8% — a relatively high growth rate considering the Office of the Secretary of Defense, but consistent with other military services. The Army's expenditures on commercial services accounted for 40.9% of the total Army IT market in FY1999 and is expected to increase to 41.4% by FY2004. The Army's information technology budget overall is forecast to experience a moderate compound annual growth rate over the next several years despite an ongoing decline in federal funds since the creation of the Defense Secretary's Commission on Base Realignment and Closure (BRAC) in 1988. Exhibit V-4 details the addressable IT budget of the Department of the Army.

Exhibit V-4

Addressable Portion of the IT Budget of Department of the Army

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	468	523	537	558	580	605	5.3%
Computer Systems	748	870	895	920	954	995	5.9%
Commercial Services	843	920	961	1,011	1,066	1,130	6.0%
Total Addressable IT Budget	**2,059**	**2,313**	**2,394**	**2,489**	**2,600**	**2,729**	**5.8%**

Source: INPUT

4. Department of the Navy

The Department of the Navy, including the U.S. Marine Corps, budgeted approximately $1.9 billion for information technology products and services in FY1999. This level of spending is forecast to grow to $2.4 billion in FY2004, at a modest compound annual rate of 4.2%. Although the total information technology budget at the Navy is expected to witness very little growth over the next five years, the Navy will continue to rely on basic commercial services. Software development and systems integration have typically been the primary services required by the Navy, while the simplification of regulations governing the purchase of commercial off-the-shelf items will undoubtedly impede strong growth in these market segments. Based on recent acquisition practices, however, commercial services will likely be a steady market at the agency.

Recent decisions by the Navy to reduce ID/IQ spending in favor of multiple blanket purchase agreements (BPAs) represents a significant trend in the federal market. BPAs, contractor team arrangements and the increased use of GSA's Federal Supply Schedules for both products and services are all signs of a new agency focus — streamlining, doing more with less, discount pricing and responsibility and accountability for effective IT management and execution. These factors will foster continued growth of commercial services within the Navy, regardless of its slow growing total IT budget overall. The IT budget for the Department of the Navy is presented in Exhibit V-5.

Exhibit V-5

Addressable Portion of the IT Budget of Department of Navy

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2001	2003	2004	1999-2004
Telecommunications	551	589	605	627	650	677	3.8%
Computer Systems	808	849	872	897	930	969	3.7%
Commercial Services	552	583	609	640	675	715	5.3%
Total Addressable IT Budget	**1,921**	**2,021**	**2,086**	**2,163**	**2,254**	**2,360**	**4.2%**

[1] Includes U.S. Marine Corps Spending *Source: INPUT*

5. Department of the Air Force

The addressable IT budget of the Department of the Air Force is expected to maintain a moderate CAGR of 4.4% over the next five years, from $1.6 billion in FY1999 to $2.0 billion in FY2004. The department's spending on IT is only moderate following a 3% annual nationwide reduction in systems staff. The Air Force historically projects and reports fewer

resources for commercial services to OMB than it actually spends. The modest 4.4% growth in this market segment is higher than in the past, and probably underestimated in terms of real service opportunities. The addressable IT budget of the Department of the Air Force is presented in Exhibit V-6.

Exhibit V-6

Addressable Portion of the IT Budget of Department of the Air Force

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	385	406	417	433	450	469	4.0%
Computer Systems	594	610	627	643	666	694	3.1%
Commercial Services	641	689	720	757	798	846	5.7%
Total Addressable IT Budget	**1,621**	**1,705**	**1,764**	**1,833**	**1,914**	**2,009**	**4.4%**

Source: INPUT

6. National Aeronautics and Space Administration

Despite a declining program budget at the National Aeronautics and Space Administration (NASA) over the last several years, the agency will continue to rely heavily on information technology to support its high-tech missions and major space center field operations. Of particular note is the large portion of the addressable IT budget allocated to commercial services. In FY1999, such services comprised 58.9% of NASA's addressable IT budget and is expected to grow to 60.6% in FY2004. As with most federal agencies, basic professional services and systems integration services are the market drivers at NASA, with 5-year CAGRs of 6.3% and 5.2% respectively. Exhibit V-7 details the addressable IT market of the National Aeronautics and Space Administration.

NASA has been a forerunner in the area of outsourcing over the last few years. Outsourcing is a key growth area in the federal market for many reasons – most important of which is the new breadth in the types of outsourcing being performed by agencies. As opposed to the historical data center outsourcing, NASA is now concentrating on business outsourcing – or outsourcing a piece of the mission. Also, NASA's ODIN contract is a leader in the area of "outsourcing the desktop" in which technology is acquired as a utility rather than a commodity. These types of ventures explain the projected growth in the commercial services market – a 5.7% CAGR over the next five years.

Exhibit V-7

Addressable Portion of the IT Budget of the National Aeronautics & Space Administration

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	225	215	229	243	261	280	4.5%
Computer Systems	453	439	462	487	519	554	4.1%
Commercial Services	972	916	990	1,075	1,172	1,283	5.7%
Total Addressable IT Budget	**1,649**	**1,570**	**1,680**	**1,805**	**1,951**	**2,117**	**5.1%**

Source: INPUT

7. Department of Energy

The Department of Energy (DOE) has identified $1.5 billion for information technology product and services contracts in FY1999, a figure that will likely grow an average of 5.7% annually over the next five years. As the Department's overall federal funding continues to decline at an average of 3% from 1994 to 1998, it will rely more heavily on vendors to fulfill its program performance requirements. DoE already outsources to a large degree and is one of the leading agencies overall for outsourcing spending. Currently, many of DoE's laboratories are actually run by contractors. As seen in the expected spending, this trend will continue. The addressable IT budget forecast for the Department of Energy is presented in Exhibit V-8.

Exhibit V-8

Addressable Portion of the IT Budget of Department of Energy

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	261	262	277	292	312	332	5.0%
Computer Systems	572	583	612	643	682	724	4.9%
Commercial Services	698	691	746	809	882	965	6.7%
Total Addressable IT Budget	**1,530**	**1,536**	**1,635**	**1,745**	**1,875**	**2,022**	**5.7%**

Source: INPUT

8. Department of the Treasury

IT spending at the Department of the Treasury is anticipated to experience a CAGR of 4.8% from FY1999 to FY2004, a considerable drop from prior reporting. As the eighth largest user of contractor services in

the federal government in FY1998, Treasury will continue to command a large share of the total computer systems and commercial services markets. Several factors and recent trends at the agency solidify its position in the market. First, Congress and the General Accounting Office continue to stress the "critical need" to improve business operations and rectify ongoing technical and management problems, notably at the Internal Revenue Service. As a result, the 1996 Treasury-Postal Service appropriation bill mandated the creation of the National Commission on Restructuring the Internal Revenue Service. Recent restructuring and business process reengineering efforts at the department have demanded greater resources for design and consulting, education and training, as well as systems integration. If effectively implemented, however, BPR may curtail services spending in the outyears. Furthermore, the department continues to study the feasibility of outsourcing most of its returns processing by the year 2001 — further generating demand for commercial services.

The addressable IT budget of the Department of the Treasury is presented in Exhibit V-9. The decline in growth rate over the last two reporting periods is due to oversight controls imposed on program spending until the IRS in particular can move more effectively on its modernization plan.

Exhibit V-9

Addressable Portion of the IT Budget of the Treasury Department

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	342	332	350	368	391	416	4.0%
Computer Systems	491	481	505	531	563	597	4.0%
Commercial Services	463	446	481	522	568	622	6.1%
Total Addressable IT Budget	**1,296**	**1,258**	**1,335**	**1,420**	**1,522**	**1,635**	**4.8%**

Source: INPUT

9. Department of Health and Human Services

The Department of Health and Human Services (HHS) allocated an estimated $1.1 billion for information technology contracts in FY1999. This market has a projected CAGR of 5.9% from FY1999 to FY2004, reaching $1.5 billion. With an increased focus on improving its services to the public, HHS spends heavily on software development and systems integration. The department, notably through the National Institutes of Health (NIH), is also setting the pace for federal agencies in simplified acquisitions under the 1996 Clinger-Cohen Act of procurement

regulations. Several major indefinite delivery, indefinite quantity (IDIQ) and multiple award contracts have been awarded at HHS for computer products and services. Exhibit V-10 provides the addressable IT budget forecast of the Department of Health and Human Services.

Exhibit V-10

Addressable Portion of the IT Budget of Department of Health & Human Services

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Telecommunications	166	164	174	185	198	213	5.0%
Computer Systems	270	269	285	302	323	346	5.1%
Commercial Services	696	681	735	798	869	952	6.5%
Total Addressable IT Budget	**1,133**	**1,114**	**1,194**	**1,285**	**1,391**	**1,511**	**5.9%**

Source: INPUT

10. Department of Justice

The Department of Justice reported an enormous increase in anticipated IT spending. This is indicative of two things. First, law enforcement and criminal justice are high priorities for the Administration. Second, IT will place an increasing role in the law enforcement mission. Interoperability requirements for justice systems operating at the state and local level as integral to a federal program requires upgrade to virtually all justice programs.

For several years, the Immigration & Naturalization Service has had management problems that have prevented effective service. The General Accounting Office and the internal Inspector General have been critical to the point that the Congress has withheld funds. This year, renewed interest in modernizing the INS program called for increased spending that will last through the next five years.

Justice has also completed most of its hardware system replacements. With infrastructure now in place, the department will focus on service contracts. This explains the unusually high growth rate for commercial services and the decline in spending for computer systems.

The projected spending on information technology by Justice is shown in Exhibit V-11.

Exhibit V-11

Addressable Portion of the IT Budget of the Department of Justice

Category	Projected Spending by FY ($M)						CAGR
	1999	2000	2001	2002	2003	2003	1999-2004
Telecommunications	353	353	372	391	416	442	4.6%
Computer Systems	436	432	453	476	505	535	4.2%
Commercial Services	413	394	425	461	502	549	5.6%
Total Addressable IT Budget	**1,202**	**1,179**	**1,250**	**1,328**	**1,422**	**1,526**	**4.9%**

Source: INPUT

C
Agency Market Segments

In this section, agency spending trends by major submarkets are explored and forecast. The three primary market segments — telecommunications (leased circuits, telecommunications products and services, and telecommunications professional services), computer systems (hardware and software products), and commercial services (professional services, systems operations and processing services)— are further subdivided to offer an in-depth look at major subsegments within the IT budgets of the ten leading agencies. The three submarkets analyzed here include (1) the entire telecommunications market, (2) commercial services, and (3) computer systems (hardware and software products exclusive of developmental systems and services). While systems integration encompasses a host of submarkets, such as hardware systems and software products, systems integration professional services is defined here as a separate market segment.

Historical and projected spending trends reveal that of the ten largest spending agencies identified above, a different set of five lead in each of the three primary market segments. Each of the three segments are discussed below, and the budgets of the five leading agencies within each of these segments are analyzed. The budgets of these agencies are shown in Exhibit V-12.

1. Computer Systems

The computer systems segment of the federal IT market includes hardware platforms, peripherals, and any software installed to facilitate the operation of the equipment. It also includes an initial cost, if any, for installation as well as equipment maintenance. All platform sizes are included in this market segment. It does not include functional software products that focus on achieving the mission program objectives. The

assumption is that federal government does not have a mission requirement to run computer facilities.

The federal computer systems market was budgeted at $9.4 billion in FY1999 growing to $11.7 billion in FY2004, at a CAGR of 4.6%.

The five agencies with the largest computer systems segment are shown in Exhibit V-12 on the following page.

Exhibit V-12

Top Five Agency Budgets for Computer Systems

Category	Projected Spending by FY in $ Millions						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Office of the Secretary of Defense:							
PCs	368	361	377	390	408	429	3.1%
Workstations	177	174	181	188	196	206	3.0%
Mid-Range	218	213	219	224	232	241	2.1%
Large-Scale	392	384	379	374	371	385	-0.3%
HPTC	112	110	117	120	124	130	3.1%
Servers	184	181	187	199	215	215	3.2%
Department of Transportation:							
PCs	319	366	390	415	446	479	8.4%
Workstations	153	176	188	200	214	229	8.4%
Mid-Range	189	216	227	239	253	269	7.4%
Large-Scale	339	387	393	398	405	430	4.9%
HPTC	97	111	121	127	135	145	8.4%
Servers	160	183	194	212	235	240	8.5%
Department of Navy:							
PCs	205	216	225	234	246	259	4.7%
Workstations	99	104	108	113	118	124	4.7%
Mid-Range	121	127	131	135	139	145	3.7%
Large-Scale	218	229	227	224	223	232	1.3%
HPTC	62	65	70	72	74	78	4.7%
Servers	103	108	116	119	129	130	4.8%

Exhibit V-12 continued

Top Five Agency Budgets for Computer Systems (cont.)

Category	Projected Spending by FY in $ Millions						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Department of Army:							
PCs	190	221	231	240	252	266	6.9%
Workstations	91	106	111	116	121	127	6.9%
Mid-Range	112	131	134	138	143	149	5.9%
Large-Scale	202	235	233	230	229	239	3.4%
HPTC	58	67	72	74	76	81	6.9%
Servers	95	111	115	122	133	133	7.0%
National Aeronautic & Space Administration							
PCs	115	112	119	127	137	148	5.2%
Workstations	54	54	57	61	66	71	5.5%
Mid-Range	68	66	69	73	78	83	4.1%
Large-Scale	127	119	120	122	124	133	0.9%
HPTC	35	34	37	39	41	45	5.2%
Servers	54	56	59	65	72	74	6.4%
Total Federal Computer Systems Market	**9,352**	**9,714**	**10,103**	**10,549**	**11,095**	**11,698**	**4.6%**

Source: INPUT

a. Personal Computers (PCs)

The PC submarket is part of an overall desktop market that also includes some workstations. It also includes portable and hand-held processor platforms. The agencies do not break out spending for this segment, and sales is not a reflection of the different sizes. Programs such as Laptop and Hand-Held address these segments, but products distributed through these contracts are not limited to portable devices.

The total federal budget for this component of computer systems is $2.4 billion in FY1999, growing to $3.1 billion in FY2004 at a CAGR of 6.0%.

b. Workstations

The workstation submarket contains several different segments depending on the required functionality for the processor. It includes high performance Unix boxes that perform scientific tasks and at the low end the desktop machines that are not involved in high performance functions but are labeled as workstations to command attention to either

state-of-the-art requirements or occasionally to merely justify replacement of older boxes.

Total federal spending on this component of computer systems was $1.1 billion in FY1999 growing to $1.5 billion in FY2004 at a CAGR of 5.8%, slightly higher than PCs.

c. Servers/Mid-Range Systems

This segment combines the mid-range market that developed during the 1980s with the emerging PC-based server market. As the activities of these two types of systems have merged, the categories were combined to provide a more convenient forecast. Activities generally supported by these systems include departmental file services, database services and, increasingly, Internet services (e.g., messaging, web hosting, etc.). The total federal budget for this component of computer systems is $2.5 billion in FY1999, climbing to $3.4 billion in FY2004 at a CAGR of 6.0%.

This market is expected to experience significant growth for two reasons. First, web servers are becoming more and more prevalent within federal agencies as the demand for Internet-based business increases. Second, agencies implementing enterprise resource planning solutions have an increasing need for servers on which to run the required software and databases.

Total federal spending for this component of computer systems was $1.1 billion in FY1999, growing to $1.6 billion in FY2004 at a CAGR of 7.7%.

d. Large-Scale Systems

Mainframe computers and front-end processors comprise this market segment. While general purpose mainframes are less in demand than ten years ago, mainframes are more and more used for large network management and database servers.

Total federal spending for this component of computer systems was $2.6 billion in FY1999 growing to $2.8 billion in FY2003 at a CAGR of 1.4%, an increase based on the fact that need continues and price competition has not yet fully reached this class of processor.

e. High Performance Technical Computers (HPTC)

This submarket has gone through a number of technological changes over the last decade. First, high performing mainframes and then high performing mid-range computers have entered the low-end supercomputer market. Figures presented here reflect the entry of these new boxes in the market previously dominated by Cray machines, and to a lesser degree, IBM plug compatibles.

Total estimated federal spending for this component of computer systems is $720 million in FY1999, growing to $936 million in FY2004 at a CAGR of 5.4%. This reflects an increase in the use of supercomputers, but due to the competition and resulting lower prices on the low end, spending levels will not be as high.

2. Commercial Services

Major components of commercial services include basic professional services (software development, design, consulting, education and training), systems integration professional services and outsourcing. The systems integration professional services subsegment does not include hardware and software integration, nor does it involve network connectivity.

The federal government budgeted $9.7 billion in FY1999 for commercial services, growing to $13.5 billion in FY2004 at a CAGR of 6.8%.

Although industry expects that the overall systems integration segment (taking into account hardware and software integration) of the market will not grow as dramatically as it did five years ago, there remains a continuing need for integration. Unlike commercial SI contracts, federal SI includes a great deal of hardware, approximately half the value of the contract. As more and more hardware is obtained at lower cost through IDIQ contracts, lower requirements for the segment remain in the SI market. Undoubtedly the size of hardware and software SI contracts will continue to be smaller than in the past. In contrast, the SI professional services segment continues to grow. Vendors not involved in or allied with another vendor for SI may experience greater competition for post-implementation contract support. A number of professional services firms are attracted to SI contracts because of systems operations prospects for five to ten years. As a result, agencies may seek solutions to SI through alternative channels, such as IDIQ product and service contracts.

Exhibit V-13 shows the subsegments of the commercial services market for each of the five top budgeted agencies.

Exhibit V-13

Top Five Agencies for Commercial Services

Category	Projected Spending by FY in $ Millions						CAGR 99-2004
	1999	2000	2001	2002	2003	2004	
Office of the Secretary of Defense							
Basic Professional Services	643	612	639	689	727	770	3.7%
SI Professional Services	254	242	253	274	289	306	3.8%
Outsourcing	365	347	363	373	394	417	2.7%
NASA							
Basic Professional Services	381	362	394	432	470	515	6.2%
SI Professional Services	151	143	157	172	187	205	6.3%
Outsourcing	216	202	217	234	255	279	5.2%
Department of Health and Human Services							
Basic Professional Services	268	262	283	307	334	366	6.5%
SI Professional Services	107	104	113	122	133	146	6.5%
Outsourcing	158	154	167	181	197	216	6.5%
Department of Energy							
Basic Professional Services	268	265	286	310	338	370	6.7%
SI Professional Services	106	105	114	123	135	147	6.7%
Outsourcing	158	156	168	183	199	218	6.7%
Army							
Basic Professional Services	328	358	374	403	425	450	6.6%
SI Professional Services	130	141	148	160	169	179	6.7%
Outsourcing	186	203	212	218	239	244	5.6%
Total Federal Commercial Services Market	**9,704**	**10,104**	**10,785**	**11,556**	**12,443**	**13,463**	**6.8%**

Source: INPUT

a. Basic Professional Services

Basic professional services, which include software development, design, consulting, education and training, accounted for 39% of the total federal market for commercial services in fiscal year 1999 — with civilian and defense expenditures totaling $3.8 billion. This market is projected to sustain a 7.3% CAGR to reach $5.3 billion in FY2004, or 39.7% of the total projected commercial services market for that year.

b. Systems Integration Professional Services

Systems integration (SI) professional services are conceptualized as any combination of consulting services, software development and/or education and training services. These services commanded 15.3% of the total federal market for commercial services in FY1999. The Office of the Secretary of Defense leads other agencies in this category with an estimated $254 million for systems integration services in FY1999 and is projected to continue leading federal agencies in spending over the next several years, while growing at a modest CAGR of 3.8%. The Army and Department of Energy expect significant growth in this segment at a 6.7% CAGR over the next five years.

3. Outsourcing

Outsourcing encompasses a host contractor provided services, including platform operations, desktop services, application operations and management and business operations.

Federal spending in this market segment totaled $2.1 billion in FY1999, or 21.9% of the total commercial services market, and is projected to reach $2.9 billion in FY2004 — rising at a CAGR of 6.3%. The Secretary of Defense is the largest single federal end-user of outsourcing services, spending approximately $365 million in FY1999, and will continue to hold this position in the federal arena for several years even though its expenditures are projected to rise at only a CAGR of 2.7%. NASA, one of the largest users of outsourcing services in the federal government per dollar spent on IT, is expected to spend $216 million in FY1999 and will grow to $279 million by FY2004 at a CAGR of 5.2%. Growth in this segment will be affected in large part based on the success or failure of recent, large-scale desktop services contracts, such as Seat Management and ODIN. If successful, the growth rate of the desktop services segment will be significantly higher than forecast in this report as agencies shift spending from PC capital purchases to desktop contracts. However, based on the lukewarm reception these contracts have received by many federal agencies, a more moderate growth rate is likely.

4. Telecommunications

As discussed earlier, telecommunications includes leased data and voice circuits, telecommunications hardware, professional services in support of telecommunications and telecommunications services. The OSD budgeted more for this category than any other major organization with the exception of Department of Transportation. The federal government telecommunications market is budgeted at $7.1 billion in FY1999 and forecast to grow to $8.9 billion by FY2004 at a CAGR of 4.7%.

The five agencies with the largest telecommunications budgets are shown in Exhibit V-14

Exhibit V-14

Top Five Agencies for Telecommunications

Category	Projected Spending by FY in $ Millions						CAGR
	1999	2000	2001	2002	2003	2004	1999-2004
Office of the Secretary of Defense							
Leased Circuits	1,626	1,617	1,657	1,714	1,774	1,845	2.6%
Hardware	64	63	65	67	69	72	2.1%
Professional Services	145	138	145	154	163	173	3.9%
Network Services	845	841	862	890	921	958	2.5%
Department of the Navy							
Leased Circuits	300	316	324	335	346	360	3.8%
Hardware	56	58	60	62	64	66	3.4%
Professional Services	48	51	53	57	60	63	5.7%
Network Services	157	164	168	174	180	187	3.7%
Department of Transportation							
Leased Circuits	254	329	345	362	384	407	9.9%
Hardware	69	77	80	83	88	92	6.0%
Professional Services	19	42	45	49	54	59	25.5%
Network Services	132	171	180	189	200	212	9.9%
Department of the Army							
Leased Circuits	226	252	258	267	276	287	4.9%
Hardware	50	59	61	63	65	67	6.3%
Professional Services	74	81	84	90	95	101	6.4%
Network Services	118	131	134	139	143	149	4.9%
Department of the Air Force							
Leased Circuits	186	197	201	208	216	224	3.8%
Hardware	46	47	48	49	51	53	3.0%
Professional Services	56	61	63	67	71	75	6.0%
Network Services	97	102	105	108	112	116	3.8%
Total Federal Communications Market	**7,054**	**7,414**	**7,704**	**8,026**	**8,418**	**8,858**	**4.7%**

Source: INPUT

a. Leased Circuits

This submarket of telecommunications comprised the largest share of expenditures within virtually all federal agencies. A more detailed analysis of the leased circuits market segments reveals that data and voice use are increasing at approximately the same rate. The growth of this segment has slowed down significantly over the past two years due to two factors. Use of circuits has settled down with no new major circuits being brought into play. The second factor is the increasing use of the Internet for telecommunications requirements; primarily data transfer, but eventually voice. Total circuit spending in the federal government will grow from $3.7 billion in FY1999 to $4.6 billion in FY2004 at a CAGR of 4.3%.

b. Telecommunications Hardware

Hardware for telecommunications support is a small piece of overall telecommunications spending. Hardware is the smallest piece of the telecommunications market. It includes connecting and distribution devices, such as routers, switches and bridges. Much of the hardware component is in place, but with new capabilities being developed commercially and new requirements emerging for faster and denser throughput, hardware replacement will continue throughout this forecast period. The total federal government will have spent $549 million in FY1999 and is forecast to spend $667 million in FY2004, growing at a CAGR of 4.0%.

c. Professional Services

Telecommunications professional services is a fast growing subsegment of telecommunications. It includes network engineering, installation and maintenance. The total federal budget for telecommunications professional services in FY1999 was $837 million. It is expected to be $1.2 billion in FY2004, growing at a CAGR of 7.0%.

d. Network Services

Network services are software products loaded onto a network to perform an administration function such as network analysis, configuration control, or to perform an application infrastructure function such as e-mail or electronic commerce. The total federal budget for network services in FY1999 was $2.0 billion growing to $2.4 billion in FY2004 at a CAGR of 4.4%.

VI

Conclusions & Recommendations

The federal information technology market continues to evolve in the midst of dynamic change. This market is subject not only to all of the forces affecting the budget and appropriations processes, but also to the new industry structure being created by the acquisition reforms of 1996 and overall federal downsizing and reengineering. Awareness and understanding of the regulatory changes and commercial developments will be one key to vendor success in this market over the next five years. In addition, the ability of vendors to meet ever-changing government expectations will be a necessary skill.

This chapter discusses some of the conclusions that can be drawn from the findings of this report. These conclusions have been evaluated to develop strategic recommendations for vendors in the federal information technology market.

A
Conclusions

Certain conclusions may be drawn from the trends and forecast which shape the federal marketplace. These conclusions are shown in Exhibit VI-1 and are explained in detail below.

Exhibit VI-1

Conclusions

- Companies will continue to consolidate
- Services continues to be key
- Enterprise resource planning applications make gradual advances
- The government will continue moving toward distributed systems
- Competition between federal vendors creates disillusionment
- Outsourcing in all forms will become more commonplace
- Agencies will continue to focus on past performance
- The Year 2000 issue will remain on the front burner
- New technology and interoperability requirements will bring about the need for standards
- Strong teams are essential for success, particularly for smaller companies

Source: INPUT

Companies will continue to consolidate

In the last three years, the federal government has seen a dramatic change in the vendor base that makes up the market. There are now fewer companies overall; each providing a more broad range of IT products and services. The recent purchase by SAIC of Boeing's federal business unit and the sale of GTE's federal services continue the repainting of the landscape. Services companies are following the pattern of software giants such as Computer Associates (perennial acquirer) and hardware companies such as IBM (recently purchased Sequent Computers) and Compaq (purchased DEC in 1998). The result is generally a well-balanced vendor with specialties in a broad range of areas and the ability to cover a wider territory than ever before. This trend is expected to continue as profit margins fall and companies seek to achieve economies of scale.

Services continue to be key

As the government downsizes and continues to restructure, COTS products are important elements in the federal market as both a cost and time-saving measure. Coupled with COTS products is a demand for increased integration services as well as basic professional services such as consulting and training. Agencies are currently struggling to align their resources and people to accomplish mission goals. Much of this change involves a reengineering of the business processes. Reliance on vendors to assist in this process through the implementation of different services is a key area for the future. In addition, there is significant pressure from Congress to outsource those functions that are not directly

part of agency missions. This will continue to drive growth in the outsourcing services area.

ERP applications make gradual advances

There is ever-increasing demand for applications that run on an enterprise level, with access and interface capabilities for a wide range of employees with various functions. Enterprise applications are designed to allow smooth functioning of a business process from start to finish. These applications have caught on in the private sector and are now being examined by some federal agencies. As headcount continues to decrease, technology is relied upon to take over what was once human processing. The ability for all personnel who are part of a process to be able to communicate and share data is the driving force behind ERP implementation in the federal market. These applications are expected to firmly take hold over the next five years. This trend is enhanced by the increased demand for Windows NT as an operating environment. NT is very conducive to running ERP applications.

However, what was a strong potential last year has lost some of its momentum. Major ERP players such as Oracle, PeopleSoft, Baan and SAP America have had some difficulty marketing products that have not scaled well with government enterprises. Nevertheless, the need for ERP continues as many agencies, notably DoD RCAS, develop their own systems.

The government will continue moving toward distributed systems

The government is in the midst of an interoperability expansion. Distributed environments take on different characteristics than previously when a single agency merely extended its programs across its own distributed boundaries. New requirements for agencies to share information across boundaries into other agencies creates a different operating environment, one that has not successfully solved problems of standard data definitions and processing behaviors. The Department of Defense is attempting to standardize internal networks to an NT environment to gain efficiencies under a single operating system. However, there has been some resistance by some operating units who believe NT is ineffective or insufficient for their requirements.

Competition between vendors creates disillusionment

Increased use of multiple award contracts, GSA Schedules and Government-Wide Acquisition Contracts has put a damper on other ID/IQ and systems integration solicitations. What once appeared to vendors to be an easy way to get contract vehicles is becoming a nightmare for marketing and sales units that must increase their presence before

agencies actually purchase from them. Contracts are no longer guarantees of business.

This problem is exacerbated for vendors by the fact that labor rates provided to the federal government under these multiple award contracts are significantly lower than those provided in the commercial sector. Small businesses are critical of new contracting behaviors because very few of them have actually seen increases in real business. Government managers are concerned that vendors will not provide the high quality staff to their task orders because of profit margins that are too thin.

Outsourcing will become more commonplace

If desktop outsourcing contracts such as ODIN and Seat Management are successful, many agencies will follow suit in outsourcing functions that would not have been considered previously. Seat Management and ODIN involve outsourced management of desktop computers as a utility. Other agencies may work individually through BPAs, as the Bureau of Alcohol, Tobacco, and Firearms has done, to enhance the relationship between the service vendor and the agency. Early positive comments are increasing agency interest in the programs.

A new type of outsourcing is emerging in which agencies can outsource entire Internet based operations to a service vendor. The vendor provides the hardware, software, operations and maintenance service support through broad bandwidth connections between the agency and its business community. Initially, Internet Service Providers branded the service, but increasingly other companies specializing in the storage and retrieval of different types of information are entering the market. Most of these companies get their initial experience in the private sector and come to the government already highly qualified.

Agency focus on past performance will continue

Since the procurement reforms of 1996, agencies have increasingly relied on past performance as part of contract award evaluations. Agencies have created a formal process for evaluating contractors' performance. Past performance has become a major consideration in the evaluation process of many procurements. For the foreseeable future, past performance will remain as a major factor in obtaining government business. Vendors will help themselves by developing a solid list of references that support their capabilities and promote their strengths on previous federal contracts.

However, as the Department of Commerce successfully demonstrated, past performance can also be measured by the presence of awards and certifications of achievement. Commerce did not even rely on documented

past performance in awarding multiple contracts to small businesses for various services needed by the Department.

The Y2000 issue will remain on the front burner

Most agencies have by now attained a respectable posture regarding their mission critical inventory of programs and successful remediation from Y2K testing. The focus of concern has shifted to contingency planning, that is, what will the agency use as backup in the event of system failure resulting from uncorrected Y2K problems.

Contingency is now broader than a single agency's boundaries as information is increasingly shared across different enterprises. The current view is that the greatest liability lies in such programs, not merely between government agencies, but between them and their external partners and customers. Y2000 costs will remain significant in FY2000 and continue to divert funds from new initiatives until resolved.

New and emerging technologies as well as interoperability requirements will bring about the need for standards

As new technologies enter the market on a regular basis, the need for standardization increases. Many new software applications are platform and/or operating system specific. The government is developing a standard architect, but cannot be detailed enough to deal with platform identification or software suites. It will deal with interoperability requirements as standards. Each agency will be expected to conform to this architecture, but the process will take years to implement.

Greater expectations are placed on vendors of commercial products. Many such products are not truly interoperable and will put an agency at risk to perform interoperably. Vendors should develop more open products. One example of how industry is responding to this requirement is the Linux operating system. More interest is directed to this product as a replacement to Windows NT due to its openness and its ability to handle higher-level network operating requirements more effectively than alternatives.

The network computer is a new technology that has a large potential in the federal market. However, three distinct types of NCs are currently available, all with different configurations and functions. This will not work in a government that is moving toward enterprise solutions unless the hardware and operating software are truly open and scalable. At present, a choice in a single platform architecture is needed for an agency to ensure interoperability, and it risks being incompatible with a business partner who chooses a different system.

Strong teams are essential for success

As mentioned previously, a well-rounded team is essential to vendor success. More and more contract awards are taking place for "solution" implementation than ever before. A prime contractor will need to have a balanced team capable of seamless integration of the technology into the current agency business process. For small businesses lacking a complete range of capabilities, this will be particularly important for survival and success.

But teams may not be headed by the large integrator. Many contracts are now awarded to small business firms who may need to negotiate positions on their teams for the large integrators. Contract management skills may be new headaches for small companies who in the past have only participated as supplier or team member.

B
Recommendations

The federal information technology market is in a state of change, partly due to the federal acquisition reforms of 1996 but more recently to the year 2000 issue and the push for distributed computing environments. This state of flux has created a degree of uncertainty which makes clear predictions and forecasts of the market and its future composition difficult at best. Despite the uncertainty, the government is expected to spend in excess of $150 billion on IT from FY1999 to FY2004.

The following recommendations will assist vendors in maintaining their competitive edge to take them into the 21st Century.

Exhibit VI-2

Recommendations

- Anticipate increased competition at the task order level
- Maintain focus on marketing activities, especially post-award marketing
- Be cognizant and understand agency requirements and the implications of acquisition reform
- Understand agency requirements from an "enterprise" standpoint as well as a program standpoint
- Respond rapidly
- Emphasize cost-effective solutions
- Provide adaptive COTS products
- Take note of emerging technologies
- Establish a regional presence – closer contact with the client
- Build strong and competent teams
- Develop relationships with CIOs and other agency decision makers

Source: INPUT

Anticipate increased competition at the task order level

As discussed earlier, competition among vendors in the federal marketplace is expected to increase. Vendors must be aware of this fact. Also, vendors must be cognizant of the need for strong teams. Marketing in the reformed federal market not only involves promoting one's own offerings but also promoting the offerings of teammates in order to present a unified "solution."

Maintain marketing focus – especially after the award

Consistent with the previous recommendation, it is crucial for vendors to continue their marketing activities after the award of the contract. Many contract awards only grant the awardees the ability to continue competing. With the number of awardees on some contracts reaching into the teens, there is still a large amount of selling to be done after the award.

Be cognizant of agency requirements and acquisition reform

It has been three years since the enactment of Clinger-Cohen, the legislation that changed the face of federal procurement. Its impact can still be seen today. There has been an increased reliance on COTS products, increased use of GSA Schedules and a tendency toward more outsourcing. The process by which a contract is put in place is much more time and cost efficient. Vendors must be aware of how these changes

affect their identification of potential new business, marketing and sales strategies, as well as their capacity to deliver.

Vendors must become more aware of the mission of their clients. Knowing the functions of the agency help the vendor to better fit their expertise into the agency's requirements.

Understand an agency's enterprise requirements as well as program requirements

As the demand for enterprise applications grows in the federal marketplace, program requirements will become tailored around the overall agency goal. For example, when a subagency installs a LAN, the architecture, software and access capability will all be planned with the enterprise in mind – or the ability of users on that LAN to interface with other systems within the subagency, agency and perhaps department. The requirements will not be confined to the immediate goal but also will encompass future goals. Vendors must understand not only the mission of the agency but how each function plays a part in that mission. Requirements are no longer just program-specific. A vendor dedicated to an agency's mission will be successful.

Respond rapidly

In the past, the federal procurement cycle would sometimes last two years before the contract was finally awarded. In recent years, the timeline has shortened considerably. In this era of task orders and streamlined procurement, vendors must be willing and able to provide a rapid response to agency requirements.

Emphasize cost-effective solutions

Though cost often ranks lower than factors such as past performance in evaluating bids, it will remain a key factor in the new procurement environment. A vendor's ability to present a total solution to an agency requirement and demonstrate the savings to be achieved through implementation of that solution will be a major selling point in the next five years.

Provide adaptive COTS products

The federal government has a strong desire for commercial off-the-shelf products. However, these products must include the flexibility to be tailored to specific business functions. More than 550 vendors now offer standardized services under a GSA schedule, giving them a significant competitive advantage in meeting many specific agency requirements.

Take note of emerging technologies

Technology is evolving at a very rapid rate resulting in new and improved hardware and software releases on a very consistent basis. Agencies will be constantly examining these technologies and vendors should be aware of the other players in the market, especially the niche vendors and their offerings.

Establish a regional presence

Agencies operate across diverse geographic regions. Less and less contracting is done in the DC metropolitan area every year. There are requirements at the regional level to which vendors may respond if they have a presence there. Vendors must be responsive to the needs of agencies at the regional level, as well as at headquarters. In addition, it is important to understand the organizational structure, geographic location and responsibilities of the GSA FTS regions.

Build strong and competent teams

In a solution-driven federal market, well-balanced teams dedicated to the success of the agency's mission are essential for success. The formation of teams even before a procurement arises is highly recommended. Vendors on a team together should be comfortable with one another and should make a concerted marketing effort together. A team with a proven track record will lead the pack when it comes time for new business within the agency or a recompete contract.

Develop and nurture relationships with CIOs and agency decision makers

With more budgetary power and responsibility for IT being placed in the hands of the CIO, agency CIOs will be the primary shapers of the IT market of tomorrow. Vendors must develop meaningful relationships with CIOs and other key decision makers in each agency. Not only will this factor be critical for future projects, but also it will be instrumental in deciding the fate of existing contracts and initiatives. Vendors need to get into the mindset of the CIOs and understand their requirements from their perspective.

In today's procurement environment, agency end-users should not be overlooked either. While they may not make decisions for the large IT buys, the advent of schedules and federal credit cards have given end-users greater ability to affect purchase decisions.

With federal spending on information technology expected to top $34 billion in FY2000, opportunities exist for all vendors with solid solutions and capabilities. However, the federal IT market is unique, marked by a

constant state of change. The recommendations discussed above should provide guidance to those vendors seeking success in the federal IT market.

A

Forecast Databases and Reconciliation

A
Federal IT Budget Forecast Database

One of the features of the Electronic Government Program is the creation of a computer-based forecast model for predicting the likely growth rates of federal IT expenditures. The model uses the data provided in the new Exhibit 42 (Information Resource Plans and Budget Request) of the OMB Circular A-11: Federal Annual Budget Request Preparation Guidelines. This information provides the first two-year baseline of the five-year forecast.

Exhibit A-1 lists the four parts of the new Exhibit 42, which replaces the Exhibit 43 report from previous years. Each of the parts is shown with the spending totals of all government agencies that report. Only those agencies with IT spending exceeding $50 million per year are required to report. The remaining agencies account for less than $500 million.

In preparing INPUT's forecast model, a further iteration is conducted from the Exhibit 42 data. INPUT translates the Exhibit 42 categories into the former Exhibit 43 categories utilized by the government. This translation is provided in Exhibit A-2 below.

Once the translation from the new Exhibit 42 format to the former Exhibit 43 format is completed, INPUT recasts the numbers into its proprietary forecast model. INPUT's forecast model is used to provide industry with a more convenient view of the IT spending activities of the federal government. INPUT's forecast for FY1999 to FY2004 is presented in Exhibit A-3.

Exhibit A-1

Spending Categories of A-11 IT Budgets (Exhibit 42)

Part	FY1998 Actual	FY1999 Estimate	FY2000 Forecast	CAGR 98-00
Part 1 IT Systems by Mission Area	16,140	16,674	17,634	4.5%
Part 2 IT Infrastructure & Office Automation	15,520	15,669	16,119	1.9%
Part 3 IT Architecture and Planning	936	1,117	1,036	5.2%
Part 4 IT Resources Summary	32,596	33,460	34,789	3.3%

Source: Federal Government

Exhibit A-2 displays the Exhibit 42 totals recast into the former Exhibit 43 format for FY1999-FY2000. Forecasts beyond FY2000 through FY2004 are developed by INPUT through interviews, analysis of agency long-range plans and acquisitions and consideration of economic and political factors.

The FY1999 column displays the estimates provided by the agencies for the ongoing fiscal year previously authorized by Congress. The FY2000 column is a summation of the requests made by departments and agencies in the Executive Branch as well as an INPUT estimate of outlays predicted by organizations not governed by the Amended Paperwork Reduction Act. An additional adjustment is made for those agencies that do not fall under the Executive Branch, such as the Postal Service and the Federal Reserve. This adjustment is provided in the line item labeled "Off-IT Budget Adjustments."

The columns titled FY2001 to FY2004 represent INPUT's forecast of the likely rate of growth or decline of the government's budget elements. The forecast uses year-to-year growth rates established by INPUT each year (see the comments in Chapter 1) and estimates of the CBO and OMB.

Exhibit A-2

Federal IT Budget Forecast, FY1999–2004, Database

Former Federal Government Budget OMB A-11 Categories		Total 1999 Estim.	Total 2000 Forecast	Total 2001	Total 2002	Total 2003	Total 2004	CAGR 99-04 (%)
Equipment	Capital Purchases	4.2	4.4	4.5	4.7	4.9	5.2	4.0%
	Small Purchases/ Leases	1.6	1.7	1.7	1.8	1.9	2.0	3.7%
	Subtotal	5.9	6.1	6.3	6.5	6.8	7.1	3.9%
Software	Capital Purchases	1.4	1.5	1.6	1.7	1.8	1.9	5.9%
	Small Purchases/ Leases	0.6	0.6	0.6	0.6	0.7	0.7	4.4%
	Subtotal	2.0	2.1	2.2	2.3	2.4	2.6	5.5%
Services		5.7	6.0	6.2	6.4	6.7	7.0	4.1%
Support Services		11.7	12.1	12.9	13.8	14.9	16.1	6.6%
Supplies		0.6	0.6	0.7	0.7	0.7	0.8	3.9%
Personnel		7.1	7.5	7.5	7.6	7.7	7.8	1.9%
Other FIP Resources	Capital	0.1	0.1	0.1	0.1	0.1	0.1	3.2%
	Other	0.4	0.4	0.4	0.4	0.4	0.4	0.3%
	Subtotal	0.5	0.5	0.5	0.5	0.5	0.5	0.8%
Total Info. Technology		33.4	34.8	36.2	37.8	39.7	41.8	4.6%
Subtotal of Contracted IT		25.7	26.7	28.0	29.5	31.3	33.3	5.2%
Off-IT Budget Adjustments		0.4	0.6	0.6	0.6	0.7	0.7	14.2%
Total to be Contracted		26.1	27.2	28.6	30.1	32.0	34.0	5.4%

Figures in $ Billions *Sources: OMB, INPUT*

B
INPUT's Federal IT Expenditure Forecast Database

As explained in Chapter 1 of this report, the data compiled in the Federal IT budget model (Exhibit A-2) is dissembled and regrouped in service modes that are more familiar to the IT industry. These service modes are discussed in the main body of the report and defined in Appendix B that follows.

1. Primary Service Modes

The primary service modes that closely follow the IT budget elements are listed in the IT Market Database in Exhibit A-3.

Exhibit A-3

Federal IT Market Forecast, FY1999–2004, Database

INPUT Service Modes Contracted Portion		Total 1999 Estim.	Total 2000 Fcst	Total 2001	Total 2002	Total 2003	Total 2004	CAGR 99-04 (%)
Computer Systems	Turnkey	1.9	1.9	2.0	2.1	2.3	2.4	5.3%
	New	1.5	1.6	1.6	1.7	1.7	1.8	3.2%
	Replacement	2.5	2.6	2.7	2.7	2.8	2.9	3.2%
	Subtotal	**5.9**	**6.1**	**6.3**	**6.5**	**6.8**	**71**	**3.9%**
Software Products	Application Software	1.5	1.6	1.6	1.7	1.8	2.0	5.5%
	Sys Software	0.8	0.8	0.9	0.9	1.0	1.1	5.5%
	Subtotal	**2.3**	**2.4**	**2.5**	**2.7**	**2.8**	**3.0**	**5.5%**
Communic. Network Services	Leased Circuits	3.7	3.9	4.0	4.2	4.4	4.6	4.3%
	Equipment	0.5	0.6	0.6	0.6	0.6	0.7	4.0%
	Prof Services	0.8	0.9	0.9	1.0	1.1	1.2	7.0%
	Network Svcs	2.0	2.1	2.1	2.2	2.3	2.4	4.4%
	Subtotal	**7.1**	**7.4**	**7.7**	**8.0**	**8.4**	**8.9**	**4.7%**
Processing Services	Transaction	0.1	0.1	0.1	0.1	0.1	0.1	1.4%
	Utility/ Batch	*	*	*	*	*	*	1.4%
	Subtotal	**0.2**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**1.4%**
Professional Services	Software Dev	2.3	2.4	2.6	2.8	3.0	3.2	7.5%
	Design/Cons	0.8	0.9	0.9	1.0	1.1	1.1	7.3%
	Ed/Training	0.7	0.7	0.8	0.8	0.9	0.9	6.8%
	Subtotal	**3.8**	**4.0**	**4.3**	**4.6**	**4.9**	**5.3**	**7.3%**
SI - Prof Svcs		**1.5**	**1.6**	**1.7**	**1.8**	**2.0**	**2.1**	**7.5%**
Outsourcing	Platform Op's	0.6	0.6	0.6	0.7	0.7	0.8	6.3%
	Applic. Ops	0.9	0.9	0.9	1.0	1.1	1.2	6.3%
	Desktop Svs	0.2	0.2	0.2	0.3	0.3	0.3	6.7%
	Network Mgt	0.3	0.3	0.3	0.3	0.4	0.4	6.2%
	Applic. Mgt	0.1	0.1	0.1	0.1	0.1	0.2	6.7%
	Business Ops	0.1	0.1	0.1	0.1	0.1	0.1	6.3%
	Subtotal	**2.1**	**2.2**	**2.3**	**2.5**	**2.7**	**2.9**	**6.3%**
Comp Maint		**2.2**	**2.2**	**2.3**	**2.5**	**2.7**	**2.9**	**6.1%**
Total Contracted-Out		**26.1**	**27.2**	**28.6**	**30.1**	**32.0**	**34.0**	**5.4%**

** - Less than $50 million, Figures in $ Billions* *Source: INPUT*

C
Reconciliation of INPUT's 1998 and 1999 Forecasts

1. Reconciliation

Exhibit A-4 compares the same primary service modes as Exhibit A-3, which corresponds to the federal IT budget requests. It examines the FY1999 near-term results as well as the out-year results for FY2003.

Overall spending levels from FY1993 to FY1995 grew only slightly, but beginning in FY1996, agency budgets have increased dramatically. INPUT expects this increase to be sustained throughout the next five years. For FY2000, the shift toward capital investment continues, particularly for software products. However, the greatest shift in spending is toward increased professional services.

Even with a move toward commercial products, software development (6.3%) and systems integration professional services (7.9%) suggest the demand for contracted systems development will continue for the foreseeable future.

Overall, this year's FY1999 estimate is only 2.0% ($500 million) lower than forecast for FY1999 last year. This year's INPUT forecast for FY2003 is 5.3% ($1.8 billion) lower than forecast last year. The difference results from a more conservative view that reduced overall federal spending will negatively impact IT levels in the out-years.

Exhibit A-4

Federal Market Forecast Reconciliation
1998 Versus 1999 Forecasts for FY1999 and FY2003

INPUT Service Modes	Forecast For FY1999				Forecast For FY2003				98-03	98-03
	1998 ($ bil)	1999 ($ bil)	Var. ($ mil)	Var. %	1998 ($ bil)	1999 ($ bil)	Var. ($ mil)	Var. %	CAGR 98(%)	CAGR 99(%)
Process Svcs	0.1	0.2	35	27.6%	0.1	0.2	17	11.4%	1.6%	0.4%
Transactions	0.1	0.1	28	27.5%	0.1	0.1	3	2.3%	1.6%	0.4%
Utility/ Batch	*	*	7	28.0%	*	*	3	10.0%	1.6%	0.4%
Prof Services	4.3	5.2	945	22.0%	5.9	4.9	927	15.8%	8.0%	6.1%
Software Devel	2.6	2.3	339	13.0%	3.6	3.0	563	15.8%	8.2%	6.2%
Design/Consult	0.9	0.8	117	12.7%	1.3	1.1	199	15.8%	8.0%	6.1%
Education/Trng	0.7	0.7	85	11.1%	1.0	0.9	164	15.8%	7.5%	5.5%
Outsourcing	2.4	2.1	232	9.8%	3.2	2.7	502	15.8%	7.0%	5.1%
Platform Ops	0.6	0.6	61	9.8%	0.7	0.7	131	15.7%	6.9%	4.5%
Applic. Ops	1.0	0.9	94	9.9%	1.3	1.1	202	15.8%	7.0%	4.7%
Desktop Svcs	0.2	0.2	24	9.8%	0.3	0.3	53	15.7%	7.4%	7.9%
Network Mgt	0.3	0.3	32	9.9%	0.4	0.4	68	15.9%	6.9%	6.5%
Applic. Mgt	0.1	0.1	13	10.0%	0.2	0.2	28	15.7%	7.4%	6.3%
Business Ops	0.1	0.1	9	9.8%	0.1	0.1	20	16.1%	7.0%	7.4%
Software Prod	2.3	2.3	45	2.0%	2.8	2.8	5	0.2%	5.7%	5.8%
Application	1.5	1.5	29	2.0%	1.8	1.8	3	0.2%	5.7%	5.8%
Systems	0.8	0.8	16	2.0%	1.0	1.0	2	0.2%	5.7%	5.8%
Comm/Netwrk	6.6	7.0	450	6.8%	7.9	8.4	476	6.0%	5.0%	3.8%
Leased Circuits	3.4	3.7	357	10.6%	4.0	4.4	433	11.0%	4.5%	3.3%
Equipment	0.5	0.5	23	4.4%	0.6	0.6	21	3.4%	4.4%	5.2%
Prof Services	0.9	0.8	112	11.8%	1.3	1.1	209	16.2%	7.8%	5.7%
Network Svcs	1.8	2.0	182	10.3%	2.1	2.3	231	11.1%	4.5%	3.4%
SI - Prof Svcs	1.7	1.5	220	12.9%	2.3	2.0	369	15.8%	8.1%	6.2%
Computer HW	5.6	5.9	276	4.9%	6.5	6.8	284	4.3%	4.4%	5.3%
Turnkey	1.9	1.9	39	2.1%	2.4	2.3	107	4.5%	5.0%	5.6%
New	1.4	1.5	26	1.8%	1.6	1.7	149	9.4%	3.6%	5.1%
Replacement	2.3	2.5	120	8.5%	2.6	2.8	242	9.4%	3.6%	5.1%
Comptr Maint	2.4	2.2	218	9.1%	3.2	2.7	505	15.8%	6.8%	4.9%
Total Cont Out	26.6	26.1	522	2.0%	33.7	32.0	1,805	5.3%	6.1%	5.0%

** - Less than $50 million*

Source: INPUT

B

Terms and Definitions

A
Introduction

- This document provides:

  Definitions of the industry and market segments normally addressed by research projects.

  A guide to the terminology employed in the written documents.

  Specification of the structure used for market analysis and forecasts.
- Clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.
- Each year INPUT reviews its definitions with clients and makes changes if they are required. When changes are made, they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts.

B
Market Forecast Structure

1. Market Sectors

- Market Sectors, or markets, are groupings of the buyers of products/ services. There are three market sector categories:

  Vertical Industry markets, such as banking and finance, transportation, utilities, etc. These are called "industry-specific" markets and correspond broadly to with SIC codes.

  Functional or Process markets, such as human resources, accounting, etc., which are common across industries. These are called "cross-industry" markets.

Generic markets, which are neither industry- nor application-specific, such as the market for systems software products, and much of the Internet and electronic content (database) markets.

2. Product/Service Categories

- Product/Service Categories are groupings of products and services that satisfy a given need. While Market Sectors specify who the buyer is, Product/Service Categories specify what the customer is buying.
- INPUT's main emphasis is on information technology (IT)-based solutions. Consequently analysis and forecasts are heavily applications and industry oriented: they also focus on software and services rather than on the basic technology or hardware.

3. Market Size Measurement and Terminology

- All market sizes are estimates of user expenditures.
- By focusing on user expenditures, INPUT avoids two problems that are related to the distribution channels for various categories of services:

  Double counting, which can occur by using total vendor revenues to express market sizes when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale)

  Missed counting, which can occur when sales go through indirect channels such as mail order retailers.
- Expenditures for products and services provided by a vendor that is part of the same parent corporation as the buyer are 'captive' expenditures. These expenditures are not included in INPUT market Expenditures for products and services provided by a vendor that is forecasts. They are used in some vendor size rankings.
- Expenditures to vendors that have a different parent corporation from the buyer are noncaptive or open. These expenditures are open to competitive bid, they form INPUT market forecasts.
- When questions arise about the proper place to count these expenditures, INPUT addresses them from the buyer's viewpoint – that is, expenditures are categorized according to what customers perceive they are buying.
- Terminology describing market and organizational relationships is as follows:

  "Vendor" – the purveyor of goods or services.

  "Buyer" – the person or organization that purchases goods or services.

"User" – the person or organization that employs the goods and services directly or through an internal intermediary

"Customer" – the company or organization in which buyers and users are employed.

"End User" – use of this pejorative term is avoided as much as possible. It might be used to differentiate an individual who uses a product/service from the department or company in which they work which is described as the "user" of a product/service. Preferred terminology would be "individual user" or "personal user".

At times the "customer", "buyer" and "user" may be the same individual or unit but in many cases they are separate individuals.

C
Analytical Framework

- As mentioned above INPUT analyses the use of IT (broadly computer and telecommunications devices and systems) rather than the technology itself:

  This orientation emphasizes applications and solutions.

  Historically IT applications and solutions have primarily supported business and other processes.

  Today and in the future they are increasingly an integral part of the process itself, resulting in Electronic Business (EB).

- INPUT now analyses two broad market segments:

  Electronic Business (EB).

  IT Software and Services, particularly those that enable and support EB.

1. Electronic Business (EB)

- EB is the combination of Information Technology and business processes to form a new way of working.

- EB is the most important change affecting organizations as we go into the 21st Century.

- Electronic Business is the embedding of IT into a business or other organizational process in order to enable that process to operate:

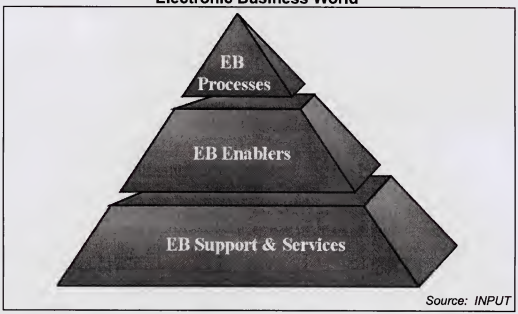
  It differs from the old model whereby IT was used to support the operation of such a process.

  A critical difference is whether or not the process can operate at all if the IT system is inoperable.

- A reservation clerk that uses a reservation system to make airline reservations is not an EB application.
- UAL's on-line system whereby a passenger makes a booking directly is EB
- INPUT analyses three levels of EB as shown in Exhibit B-1.

Exhibit B-1

Electronic Business World



Source: INPUT

- EB Processes are those normal organizational processes to which IT is applied. They fall into two categories:

  Industry Specific.

  Cross Industry (Function) Specific.
- Industry specific EB Processes:

  Electronic Banking, Electronic Government, Electronic Retailing, Electronic Brokerage, etc. (sometimes shortened to e- Banking, e-Retailing, etc.)

  They can also be non-information intensive as e-Manufacturing, e-Utilities, etc.

  The information content of supposedly non-information companies is increasing; for example there are utility companies without any generation capability.
- Cross industry EB Processes:

  Electronic Commerce (EC); this is inter - company trading.

  Electronic HR (Human Resources).

Electronic Customer Service.

- Only certain EB processes are analyzed (and defined) by INPUT at present:

  Electronic Banking.

  Electronic Commerce.

  Electronic Government.

Definitions for each of these are provided in the following sections.

i. Electronic Banking

- Electronic banking is the application of IT to enable customers to carry out banking functions directly through computer networks.
- Electronic banking includes all the major banking functions:

  Retail Banking, including Home Banking.

  Wholesale or Commercial Banking including Cash Management and similar services.

  Trust and Investment Services.
- A particular emphasis is on the impact of digital money (e-cash, electronic cash, cybercash or whatever other terminology is employed).
- Because of the relationship of e-banking with electronic commerce, there is a strong emphasis on the analysis of the payment process which involves banks but is not strictly banking.

ii. Electronic Commerce

- IT is playing a major role in reengineering organizations internal and external operations, such as the value chain or Trading Communities in which companies operate. As a result electronic commerce is growing rapidly.
- Electronic commerce is the use of IT systems to carry out the interorganizational business processes of buying and selling goods and services.
- A trading community is a group of organizations—commercial and non-commercial—involved in the trade of a particular type of goods or services, such as food, steel, electronics, etc.
- Electronic Commerce is strictly trade among organizations. However, contemporary use now includes what is actually Electronic Retailing (selling to individuals as consumers). INPUT therefore covers:

  Business to Business (BTB).

Business to Consumer (BTC).

- The impact of the Internet in Electronic Commerce will be huge. However, the majority of Electronic Commerce (in terms of the value of goods/services traded) is today non-Internet based and will continue to be so for the next few years. Electronic Commerce delivery mechanisms are analyzed into:

  Internet Commerce.

  Non-Internet Commerce.

- A related factor in Electronic Commerce is the nature of the relationship between buyer and seller:

  In pre-negotiated EC, there is a prior agreement between the buyer and seller, a contract. Orders and payments are placed against that contract.

  In ad-hoc EC there is no prior agreement. The buyer may or may not be a repeat customer.

- Electronic Commerce markets are measured in three ways:

  Value of goods and services traded.

  Volume of transactions.

  Value (cost) of operation of the IT network infrastructure supporting EC.

- To the extent possible EC markets are mapped into categories of goods and services corresponding to industry sector definitions:

  Manufactured goods.

  Travel.

  Financial services (Investment and Banking).

  Insurance.

  Business Services.

iii. Electronic Government

- Electronic government is the application of IT to enable agencies and their publics to carry out government functions directly through computer networks:

  Legislature.

  Judicial and Police.

  Administrative.

- To date there is little legislative activity (electronic citizen voting) or judicial and police activity (electronic trials). Most of the activity is in service-to-the-citizen areas, such as license renewal.

- One major area of electronic government activity is procurement. The U.S. Federal Government is placing great emphasis on reducing the cost of and streamlining the procurement process through the use of IT, particularly the "Information Superhighway" or Internet.

a. Electronic Business Enablers

- EB Enablers are those tools and services that allow or enable EB to be carried out. Enablers are primarily:

  Networks (Internet being the most important).

  Software (Particularly Enterprise Resource Planning (ERP) and Customer Management Systems (CMS) software).

  Data (Particularly Data Warehousing/Mining).

- The two areas of EB Enablers covered by INPUT in detail are:

  Enterprise Applications Solutions.

  Internet/Intranet.

- Enterprise Applications Solutions are IT systems based on software packages from companies such as SAP, Baan, Oracle Applications and PeopleSoft. This software includes Enterprise Resource Planning Application (ERP) and similar software: also included is customer management systems (CMS):

  Solutions are made of the packages and implementation.

  Implementation and support are often provided by third party service companies.

- Internet is an aggregation of open networks that allow universal access based on standard protocols.

- Intranets are private networks using Internet protocols, technology and in some cases services.

- Internet services themselves may be used in two ways:

  Completely open allowing public access to a server, content or application: qualifiers may subsequently be applied.

  Privately; where an organization only allows access to a limited set of people or organizations.

- Some people use the term 'Extranet' signifying an Intranet that is accessible by people or organizations other than the Intranet owner. INPUT does not generally use this term as the boundaries of organizations are almost never rigid these days so that Intranets almost be definition often extend beyond an organization chart.

b. EB Support and Services

- EB Support and Services activities either operate a business process directly (Business Process Outsourcing) or support that operation. Two segments analyzed are:

  Customer services and support to keep the Electronic Business functioning through disasters, upgrades and routine maintenance events.

  Operational services including outsourcing, computer processing services and network services.
- IT Customer Services and Support covers traditional product maintenance and support. It includes:

  Computer and communications.

  Equipment and software.

  Environmental services.

  Maintenance.

  Call centers, helpdesk, interactive services.

  Non-IT services.
- Electronic Customer Service will be added as an EB Process program in the future:

  Customer Service in all industries is changing rapidly.

  Customer Management Systems (CMS) are increasingly technology based.
- Operational Services are those services that provide continuous computers/network operations and/or support.

  IT Outsourcing.

  Business Process Outsourcing.

  Processing Services.

  Network Services.

  ISPs.

  Other Services.

- Outsourcing is an outgrowth of facilities management (a popular 1970s term). It involves long term contracts for significant processes:

  IT outsourcing is the contracting of various types of IT services.

  The scope of outsourcing has changed; it is no longer just data center focused; network management, DTS (Desktop Services), application management, etc. have been added

  Business Process Outsourcing is the contracting for IT-based processes (e.g. Electronic Commerce or customer services); it is the natural outgrowth of the embedding of IT into business processes.

  Processing and network services contracts can be very similar in nature to outsourcing contracts but do not involve long term commitments.
- Processing Services are not often application or function related and, although they almost always involve Network Access, the computers processing part of the application is the most important. Classic examples are disaster recovery, payroll processing, health claim processing, etc.
- Network services are suitable but in this case the Network is more important then the processing: e-mail, EDI, value added Network Services are included here.
- Internet services are most often Network Services. However, transaction services that simply use the Internet for connection are classified as processing services.
- Because of the interaction of business process, computer processing and networks in this area, there is a high potential for overlap, double counting, poor definition and confusion. This is compounded by rapid change in the environment largely caused by the Internet phenomenon.

2. IT Market Structure

- As described in section C above INPUT now recognizes two broad market segments, Electronic Business (EB) and IT Software & Services .
- IT Software & Services expenditures are a component of total user expenditure on IT which also includes equipment and in-house personnel.

- INPUT provides an analysis of total user IT expenditure in its World-wide Market Forecast Program. In this analysis it recognizes six major discrete components of expenditure:

  Equipment – expenditure on computer and data communications hardware products.

  Communications – all expenditure on IT - related data communications services.

  Software Products – all expenditure on systems software products and applications software product licences including support services where these are included within the basic license fee.

  IT Services – all expenditure on professional services, systems integration, outsourcing, processing services, network services, turnkey systems.

  Staff – direct in - house staff costs directly concerned with IT or the support of it.

  Facilities – IT budget expenditure on overheads such as space, heating, lighting, furniture, vehicles etc.

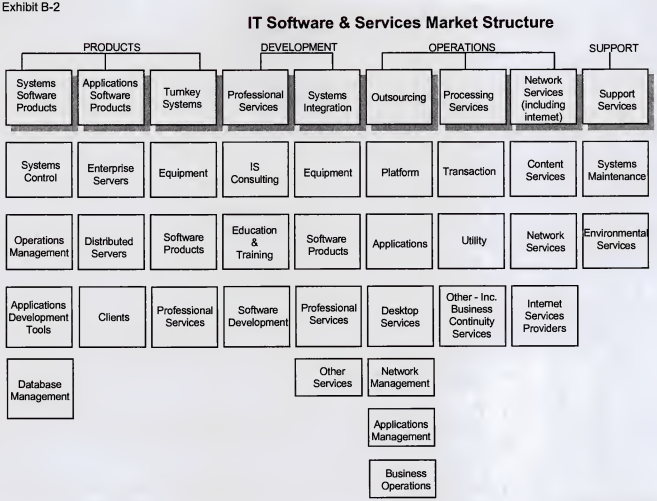
- INPUT's service sectors, described in detail below, can involve the delivery of a combination of components of people, computer processing and software products.

- The six categories defined above represent, however, the basic components or `inputs' to the operation of IT by a user

- N.B that the IT Services category defined above does not correspond to INPUT'S definition of the IT Software & Services market since the latter includes all software products and the equipment delivered through service channels.

- The structure and components of the IT Software & Services market are shown in Exhibit B-2.

Exhibit B-2



Source: INPUT

3. IT Software and Services Markets

- IT Software and Services are computer/communications related products and services that customers buy to develop and/or use in IT systems.
- The term 'Information Services' has been dropped since it is increasingly used to describe 'content services' such as those delivered electronically by the Internet or other means.
- In general, the IT Software & Services market does not involve providing equipment to users. The exception is when the equipment is part of an overall service offering such as a turnkey system, an outsourcing contract, or a systems integration project.

- The IT Software & Services market excludes pure telecommunication carrier services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot feasibly be separated from other bundled services (e.g., some outsourcing contracts), the transport costs are included as part of the IT Software & Services market.
- IT Software & Services typically involve one or more of the following:
- Platform and development products and services:
- Packaged software products, including systems software or applications software (called *Software Products*).
- A combination of computer equipment, packaged software and associated support services that will meet an applications systems need (called *Turnkey Systems*).
- A combination of products (software and equipment) and services in which the vendor assumes responsibility for the development of a custom solution, or part of a solution, to an information systems need (called *Systems Integration*).
- People services that support users in planning, developing and operating information systems (called *Professional Services*).

Operational services:

- Services that provide operation and management of all or a significant part of a user's information systems or telecommunications functions under a long-term contract (called *Outsourcing*).
- Use of vendor-provided computers to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*).
- Network Services has two components:

  Services that provide or support the operation of a customer's computer/communications network or network facility; these are typically services such as Internet services provision (ISPs), value added network services (VANs), electronic mail services, etc. (called Network Services).

  Services that provide network access to and use of public and/or proprietary information such as financial data bases and news (called Electronic Content Services).
- Services that support the installation, operation and maintenance of computer and digital communications equipment and software products (called *Customer Services*).

- The analytical framework of the IT Software & Services industry consists of the following interacting factors:

  Overall and industry-specific business environment (trends, events and issues).

  Technology environment; user/buyer IT requirements.

  Size and structure of markets; vendors and their products, services and revenues; distribution channels; and competitive issues.
- A particular aspect of the whole industry is the Internet:

  The Internet will have an increasing impact on each product/service category in the IT Software & Services industry.

  Internet related markets are defined as subsets within each of the categories.

  This allows aggregation into an overall Internet market.

D
IT Software & Services Market Definitions

- Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately form the price of the software product itself.

1. Software Products

- The software product support business is those continuing activities provided by a vendor that are necessary to make the product work, outside the delivery of the product itself. Included are associated support activities such as telephone support, problem anaylis and remote software diagnostics, software updates, software configuration and turning, software installation, on-site support and initial training
- Software product support is often provided by the vendor as part of the licence agreement. Where it is provided be a third - party for a separate charge it is included in Customer Services.

a. Systems Software Products

- Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into four submodes. See Exhibit B-3.

Systems Control Products - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

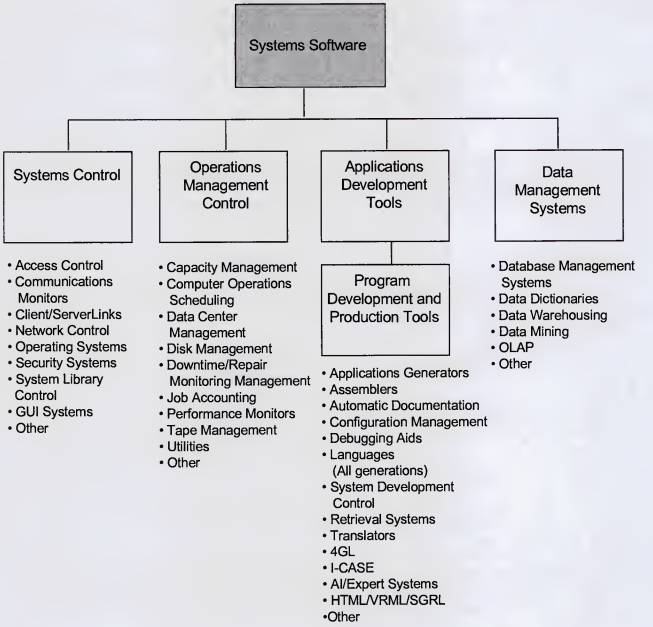
Operations Management Tools - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

Applications Development Tools - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, database management systems, report writers, project control systems, CASE systems and other development productivity aids.

Database Management Systems - Database management systems (DBMSs), data dictionaries and database-related management software

Exhibit B-3

Systems Software Products Market Structure



Source: INPUT

- INPUT also forecasts systems software products by platform: mainframe, minicomputer and workstation/PC. These terms reflect a traditional view of processing platforms based upon size or computational capability.
- In some reports, INPUT uses terms for the three platforms based upon functionality, not size or processing power, e.g: enterprise server, departmental server and client.

b. Applications Software Products

- Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems.
- INPUT categorizes applications software products into two groups (see Exhibit B-4):

  Industry Specific Applications Software Products - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (or vertical) market and sold to that market only. Examples include software products to perform such functions as demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

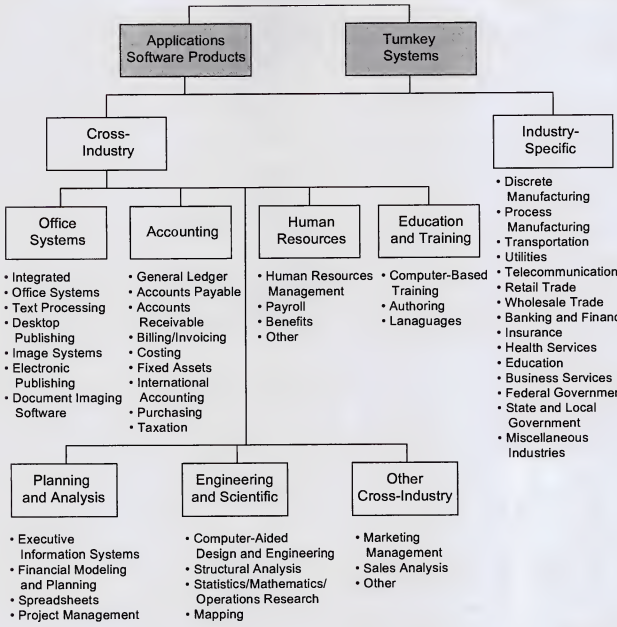
  Cross-Industry Applications Software Products - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.
- INPUT also forecasts the applications software product/service category by platform: as for systems software products.

2. Turnkey Systems

- A turnkey system integrates equipment (e.g., CPU, peripherals), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements.
- Value added by the turnkey system vendor is primarily in the software and professional services provided.
- INPUT classifies turnkey systems into two groups, as it does for applications software products (see Exhibit B-4)—those systems that are industry-specific and those applicable to the cross-industry markets. Many CAD/CAM systems and small business systems are turnkey systems.

Exhibit B-4

Application Products and Turnkey Systems Market Structure



Source: INPUT

- Computer manufacturers (e.g., IBM or Apple) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

- Most turnkey systems are sold through channels known as value-added resellers (or VARs) and defined below:

  Value-Added Reseller (VAR) - A VAR adds value to computer hardware and/or software and then resells it.

  The major value added is usually applications software for a vertical or cross-industry market, but also may include many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

- Turnkey systems have three components:

  Equipment - computer hardware supplied as part of the turnkey system.

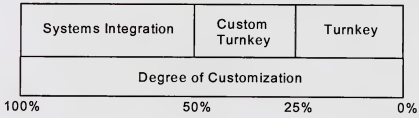
  Software Products - prepackaged systems and applications software products.

  Professional Services - services to install or customize the system or train the user, provided as part of the turnkey system sale.

- Exhibit B-5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

Exhibit B-5

The Customization Spectrum



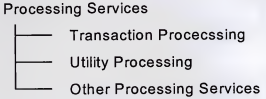
Source: INPUT

3. Processing Services

- This product/service category includes three subcategories: transaction processing, utility processing, and "other" processing services. See Exhibit B-6.

Exhibit B-6

Processing Services Market Structure



Source: INPUT

- The three processing services subcategories are:
- Transaction Processing - The client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor or customer site to process specific applications and update client databases. The application software is typically provided by the vendor.
- Utility Processing - The vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.
- Other Processing Services - The vendor provides a service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services. This category also includes backup, contingency and disaster recovery services.

4. Outsourcing

- Outsourcing (previously called Systems Operations and Facilities Management) was introduced as a product/service category in the 1990 Market Analysis and Systems Operations programs.
- Outsourcing is a long-term (greater than one year) relationship between a client and a vendor in which the client delegates all, or a major portion, of an operation or function to the vendor.
- The operation or function may either be solely information systems outsourcing-based, or include information systems outsourcing as a major component (at least 30%) of the operation.
- The critical components that define an outsourcing service are:

  Delegating an identifiable area of the operation to a vendor

  Single-vendor responsibility for performing the delegated function

- Intended, long-term relationship between the client and the vendor, where:

  The contract term is for at least one year

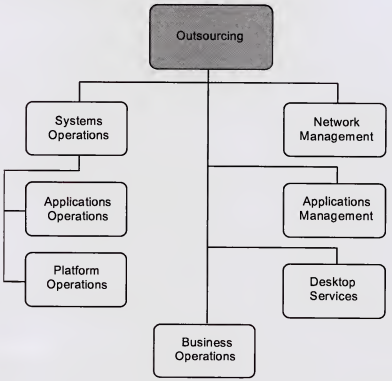
  The client's intent is not to perform the function with internal resources

- The contract may include non-information systems outsourcing activities, but information systems outsourcing must be an integral part of the contract.

- The outsourcing product/service subcategories have been defined as shown in Exhibit B-7 and defined below:

Exhibit B-7

Outsourcing Components



Source: INPUT

- Platform Operations - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- Applications Operations - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

- Network Management - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the client's voice communications resources. A network management outsourcing contract may include only the management services or it may cover the full costs of the communications services and equipment plus the management services.

- Desktop Services - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

  Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

- *Applications Management* - The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may also develop and implement new application systems for the client.

- An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services, the relationship is project based. Under applications management, it is time and function based.

- These services may be provided in combination or separately from platform outsourcing.

- *Business Operations* - Business operations outsourcing (also known as business outsourcing or functional outsourcing) is a relationship in which one vendor is responsible for performing an entire business/operations function, including the information systems outsourcing that supports it. The information systems outsourcing content of such a contract must be at least 30% of the total annual expenditure in order for INPUT to include it in the outsourcing market. Examples of business operations that are outsourced include telephone company billing and employee benefits processing.

- Outsourcing vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the US Federal Government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

- Systems integration is a vendor service that provides a complete solution to an information system, networking, or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

- The components of a systems integration project (see Exhibit B-8) are the following:

  Equipment - The information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

  Software Products - Prepackaged applications and systems software products.

  IT-Related Professional Services - The value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and, if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and outsourcing and maintenance.

  Other Products and Services - Most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

Exhibit B-8

Products and Services Included in Systems Integration Projects

Equipment
- Information systems
- Communications

Software Products
- Systems software
- Applications software

IT Related Professional Services
- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operation/maintenance

Other Miscellaneous Products/Services
- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

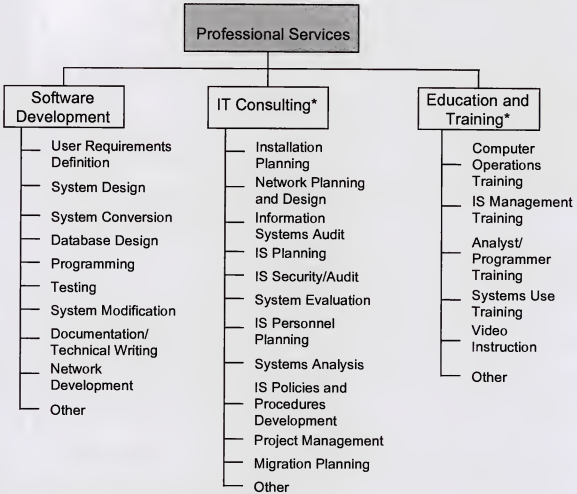
Source: INPUT

6. Professional Services

- This product/service category includes three subcategories: consulting, education and training, and software development. Exhibit B-9 provides additional detail.

Exhibit B-9

Professional Services Market Structure



* Related to computer systems, topics, or issues

Source: INPUT

- The three subcategories are defined as follows:

  IT Consulting - Services include information technology consulting (related only to information systems, and not general business consulting) in a broad range of areas, including planning, design, audit, evaluation and analysis; information systems re-engineering; feasibility analysis and cost-effectiveness studies; and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and outsourcing.

Education and Training - Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.

Software Development - Services include user requirements definition, systems design, contract programming, documentation, and implementation of software, performed on a custom basis. Conversion and maintenance services are also included.

7. Network Services

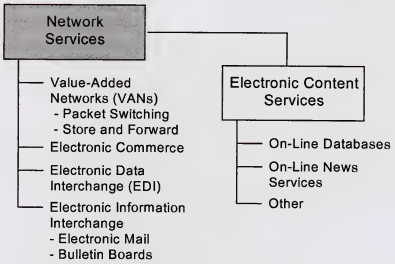
- Network services include a variety of telecommunications-based functions and operations, including those related to the Internet. This category includes two subcategories, as diagrammed in Exhibit B-10. Each is defined in greater detail below.

- *Electronic Information Services* - Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including topics such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, and automobile valuations. The terminals used may be computers themselves, such as communications servers or personal computers.

- Users inquire into and extract information from the databases and they may load extracted data into their own computer systems. The vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's databases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

Exhibit B-10

Network Services Market Structure



Source: INPUT

- The two major categories of electronic information services are:

  On-line Databases - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

  On-line News (Text) Services - Unstructured, primarily textual information on people, companies, events, etc. These are most often news services.

- While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM (optical disks) to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

- *Network Applications Services* - The three types of network applications services are:

  Value-Added Network Services (VAN Services) - VAN services are enhanced transport services that involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

  VAN services were originally provided only by specialized VAN carriers (e.g., Tymnet and Telenet); today, these services are also offered by traditional common carriers (e.g., AT&T and Sprint). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) Services- Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Customer Services

a. Services

The Customer Service sector is defined by INPUT as follows:

- Equipment maintenance - the repair or routine preventive maintenance of computer systems hardware or hardware components. Included are associated support activities such as telephone support, problem analysis and remote diagnostics. Contracts may be for one or more years; alternating repairs may be effected on an ad hoc basis.
- Environmental Services - are defined as all planning and implementation services which affect the environments in which computer platforms are expected to run. For these purposes, environment can mean any of the following:

  The computer room fixtures and fittings

  Cabling between computers and other devices in a system or network.

  Physical environment, such as: electrical power, air conditioning, water cooling, smoke or fire detection equipments.

  Network attachments.

  Buildings in which computers or network devices or terminals must reside.
- Environmental services normally involve the installation, upgrade, repair or de-installation of some piece of equipment, but may be restricted to planning only.

b. Equipment

- Computer Equipment - 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. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

- Peripherals - Includes all input, output, communications, and storage devices (other than main memory) that can be channel-connected to a 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 devices.
- Storage Devices - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), bubble and optical memories, and mass storage devices
- Computer Systems - Includes all processors, from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional. This category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.
- Personal Computers (PCs) - Smaller computers using 8-, 16-, or 32-bit computer technology, generally designed as desktop or laptop devices—e.g., to sit on a desktop or as a portable for individual use. Prices are generally less than $3,000. These devices form the bulk of the clients in a client/server environment.
- Workstations - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as database access, file storage and backup, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.
- Departmental Servers - These are generally minicomputers or midsized computers priced from $5,000 to $350,000. Many client/server computers are in this category.
- Enterprise Servers - Traditional mainframe and supercomputers costing more than $350,000.

- *Client/server computing* - Client/server is an architecture that assembles applications software and databases, systems software, and computer and networking equipment into a usable form for the purpose of leveraging information technology investments. Broadly defined, it can include any kind of server, such as file servers and network servers, that are accessed by any kind of client, including a nonintelligent terminal. INPUT has elected to use the narrower and newer definition, by which application and data processing is shared between a client and a server. It is through the act of sharing that the greatest benefit is derived in terms of leveraging information technology investments. It is also the cause of the greatest change for vendors and users. As noted above, using client/server terminology, computers can be segmented into three broad categories—enterprise servers, departmental servers and clients—roughly corresponding to the platform categories: mainframes, minicomputers and workstation/PCs.

E
Industry Sectors

1. Industry Sector Definitions

Industry sectors are based on the most recent revision of the Standard Industrial Classification (SIC) code system, as shown in Exhibit B-11.

Exhibit B-11

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing, and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

Source: INPUT

Exhibit B-11 (continued)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Trade	52xx	Building materials
	53xx	General merchandise stores
	54xx	Food stores
	55xx	Automotive dealers, gas stations
	56xx	Apparel and accessory stores
	57xx	Home furniture, furnishings and accessory stores
	58xx	Eating and drinking places
	59xx	Miscellaneous retail
Wholesale Trade	50xx	Wholesale trade - durable goods
	51xx	Wholesale trade - nondurable goods
Banking and Finance	60xx	Depository institutions
	61xx	Nondepository credit institutions
	62xx	Security and commodity brokers, dealers, exchanges and services
	67xx	Holding and other investment offices
Insurance	63xx	Insurance carriers
	64xx	Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

Source: INPUT

Exhibit B-11 (continued)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting, and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors
Personal Households	88xx	

Source: INPUT

2. Process or Cross-Industry Sector Definitions

- These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.
- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.
- The cross-industry markets are:

a. Accounting/Finance

- Consists of such functions as:

  General ledger

  Financial management

  Accounts payable

  Accounts receivable

  Billing/invoicing

  Fixed assets

  International accounting

  Purchasing

  Taxation

  Financial consolidation.

- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector

b. Human Resources

- Human resources companies:

  Benefits administration.

  Government compliance.

  Employee relations.

  Manpower planning.

  Compensation administration.

  Applicant tracking.

  Position control.

Payroll processing.

c. Education and Training

- Education and training consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system, or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

d. Office Systems

- Office systems companies the following six categories:

(1) Integrated Office Systems (IOSs) - IOSs integrate the applications that perform common office tasks. Typically, these tasks include the following core applications, all of which are accessed from the same terminal, microcomputer, or workstation:

- Electronic mail/groupware.
- Decision support systems.
- Time management/workflow.
- Filing systems/document management.

(2) Text Processing - is the most common microcomputer application and is a basic application within the office systems sector. Text processing addresses several levels of functionality, from the production of simple correspondence to large document generation in which many people from different departments have input.

(3) Desktop Publishing (DTP) - refers to the page-design software programs that allow small and midsized organizations to publish printed documents (brochures, catalogs, newsletters, reports, etc.) from the desktop. The primary functions of DTP software include the manipulation of the following functions:

- Layout and design of columns
- Text manipulation (font type)
- Graphic manipulation
- Print Control (color type, paper type)

(4) Electronic Publishing - includes composition, printing, and editing software for documents containing multiple typefaces and graphics, including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing facilitates document management and control from a single point, regardless of how many authors/locations work on a document. Desktop publishing (DTP), on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer.

(5) Graphics - Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. Thus, the graphics component of office systems sector includes the following elements:

- Presentation graphics represent the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data.
- Paint and line art drawing programs are used for illustrations, while page layout programs are used to integrate text and graphics.
- Electronic form programs allow users to create and print forms in-house. Some applications work with OCR scanners, allowing users to scan pictures and logos directly onto forms.

(6) Document Imaging Software - allows users to manipulate (store, retrieve, print) images that have been scanned from paper documents. The applications that imaging software generates include: full text retrieval, document management, and database management. Document imaging software is a component of an imaging system. Hardware components of imaging systems include: scanners, image servers, workstations, optical drives, printers, and storage devices.

e. Engineering and Scientific

- Engineering and scientific activities encompass the following applications:

Computer-aided design and engineering (CAD and CAE).

Structural analysis.

Statistics/mathematics/operations research.

Mapping/GIS (Geographic Information Systems).

Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector, as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

f. Planning and Analysis

- Planning and analysis consists of software products and information services in four application areas:

  Executive Information Systems (EIS).

  Financial modeling or planning systems.

  Spreadsheets.

  Project management.

g. Sales and Marketing

- Sales and marketing encompasses the following marketing/sales applications:

  Sales analysis.

  Marketing management.

  Demographic market planning models.

h. Other Processes

- Two other process areas that are emerging as significant cross-industry sectors are Customer Services and Logistics. They comprise the following:

- Customer Care/Services:

  Support.

  Repair/diagnostics.

  Help desk.

  Consulting.

- Logistics:

  Invoice management.

  Replenishment.

  Distribution.

3. Product/Service Category Reporting by Sector

- This section describes how the product/service forecasts relate to the market sector forecasts. Exhibit B-12 summarizes the relationships.

Processing Services - The transaction processing services subcategory is forecasted for each industry and cross-industry market sector. The utility and other processing services subcategories are forecasted in total in the general market sector.

Turnkey Systems - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

Applications Software Products - Applications software products are forecast for the 15 industry and 7 cross-industry sectors.

Outsourcing - Each of the outsourcing subcategories is forecasted for each of the 15 industry sectors.

Systems Integration - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

Professional Services - Professional services and each of its subcategories are forecasted for each of the 15 industry sectors.

Exhibit B-12

Product/Service Category versus Market Sector Forecast Content

Product/Service Category	Product/Service Subcategory	Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction	✓	✓	
	Utility			✓
	Other			✓
Turnkey Systems		✓	✓	
Applications Software Products		✓	✓	
Outsourcing	Platform Ops.	✓		
	Application Ops.	✓		
	Desktop Svcs.	✓		
	Network Svcs.	✓		
	Applications Mgmt.	✓		
	Business Ops.	✓		
Systems Integration		✓		
Professional Services		✓		
Network Services	Network Services.	✓		
	Electronic Info. Svcs.	✓		✓
Systems Software Products				✓
Equipment Svcs.				✓

Source: INPUT

- Network Services - The network applications subcategory of network is services forecasted for each of the 15 industry sectors. Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.
- Systems software products - Systems software products are forecasted in total for the general market sector.
- Equipment services - Equipment services and its subcategories are forecasted in total in the general market sector.