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PROFESSIONAL SERVICES FORECAST 1985-1993

RECONCILIATION OF IBM/INPUT VARIANCES IN INDUSTRY DEFINITIONS AND INFLATION ASSUMPTIONS

Prepared For

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Introduction

I

Introduction

This section contains a statement of the objectives of the study that was performed for IBM by INPUT, together with a statement of the scope of the project. In addition, this section describes, in detail, the methodology that was employed throughout the project as the means of reaching the stated objectives.

A

Objectives

The primary objective of the project was to re-state the market forecast for the sale of the information services industry's professional services, within the domestic United States market, through the year 1993. The re-statement was done in order to quantify this market, using the industry sectors as defined by IBM as opposed to using the industry sectors defined by INPUT. In this context, the overall professional services figures were not changed, except as follows:

- INPUT's inflation factor assumptions were subtracted from the INPUT forecast and, in their place, IBM's inflation factor assumptions were applied.
- The forecast was extended on a straight time basis through 1993 from the previous extension, which was through 1992. This was done because this study preceded the publication of INPUT's 1993 forecast.
- A list of key applications, the development of which require professional service, was provided on a "best efforts" basis. This was provided both by industry and by submode (i.e., consulting, software development, etc.).
- A list of major vendors, by sub-mode, was provided.

- A list of major vendors, by industry segment, was provided.
- A sample list of large contracts for professional services in commercial markets, by industry, was provided on a "best efforts" basis. These contracts have been categorized by industry, using IBM's definition of industry sectors. (Contracts within the Federal Government are available through INPUT's Federal Information Systems and Services Program.)

B

Scope

The scope of the project is defined as follows:

1. The forecasts are limited to the professional services delivery mode within the information services industry (see Appendix B, Exhibit B, "Definitions").

2. The forecast uses 1985 as the base year and extends through 1993, with the following requirements:

   a. IBM's inflation factor assumptions are used in place of INPUT's.
   b. The forecast is extended through 1993, as existing INPUT fore casts do not yet extend beyond 1992.

4. The industry sectors contained in the recast forecast figures were as defined by IBM and provided to INPUT at the start of the project.*

5. The ancillary data pertaining to key applications, major vendors, and large contracts (all within the professional services delivery mode) was extracted from existing INPUT files. INPUT did not, in the context of this study, do any primary research in these areas.

C

Methodology

The methodology of recasting the forecast data is described below. The methodology pertinent to achieving the project's secondary objectives is not included.

* **NOTE:** INPUT adjusted IBM's inflation factor for 1989, based on a November conversation between Messers Rusiakas of IBM and Peterson of INPUT.

1. A series of 11 worksheets were created, one for each major industry sector, as defined by INPUT. Each worksheet contained the follow ing data:

   a. A list of the two-digit SIC codes that comprise the industry sub sector (see Appendix B).
   b. For each subsector, a definition of the IBM-defined industry sector (see Appendix B).
   c. An algorithm was developed, where appropriate, for moving the INPUT-defined subsector data to the appropriate IBM-defined subsector.
   d. The value to be moved, as defined by U.S. Department of Com merce and expressed in number of employees per subsector, was obtained through primary research. This led to the development of a "raw percentage" for each applicable industry sector or subsector.
   e. Where necessary, an INPUT-defined adjustment factor was developed to reflect the appropriate professional services market potential. This adjustment was necessary when a subsector had to be subdivided to conform with IBM's market definition.

2. A computer program was written and used to:

   a. Delete the INPUT inflation factors from the original INPUT professional services forecast.
   b. Execute the algorithms to segment the INPUT data and recast it in the IBM format.
   c. Assist in extending the forecast through 1993.
   d. Apply the IBM-defined inflation factors.
   e. Create the new forecast data in IBM defined format, for each of the 17 industry sectors.
   f. Create the new forecast data for each of the five professional services delivery modes.

3. Logic checks were applied after each step described in 2, above, to ensure that the data appeared reasonable and accurate.

Professional Services Market Overview—By Industry

II

Professional Services Market Overview—By Industry Segment

This chapter is organized by industry segment, with each subsection in the chapter corresponding to an industry sector, as defined by IBM. In each sector description, we have included a "thumbnail" description of the major vendors. However, we have, for the most part, only described each vendor once, generally the first time it appears in an industry listing.

A

Discrete Manufacturing

1. Industry Characteristics

The discrete manufacturing industry is the largest industry sector market for professional services expenditures. The 1986 expenditure (without inflation) is approximately $1.74 billion. This will grow to approximately $7.0 billion in 1993.

In addition to being the largest sector, the discrete manufacturing industry is expected to show a 22% annual average growth rate which makes it one of the fastest growing industry sectors.

The United States manufacturing sector has been hard hit by overseas competitive factors for a number of years. In order to compete, U.S. firms are engaging in a variety of projects leading to an ever increasing amount of plant automation. These automation projects are categorized into such applications as: computer integrated manufacturing (CIM), flexible manufacturing systems (FMS), and a variety of automation projects based on the Manufacturing Applications Protocol (MAP).

The sheer size of the manufacturing sector has attracted a large number of professional service vendors, each attempting to differentiate themselves and find a secure market niche.

The lack of standardization and regulation of the manufacturing industry, together with its size, creates a particularly attractive marketplace for professional service vendors. This is, in part, because the vendors of standard software packages can find only limited success in a market sector with such a great diversity of requirements.

2. Key Applications

Inventory Control
Plant Scheduling
Material Requirements Planning (MRP)
Manufacturing Resources Planning (MRPII)
Computer Aided Design (CAD)
Computer Aided Manufacturing (CAM)

3. Key Delivery Modes

Systems Integration

- By far the most significant mode of delivery for professional services is in the area of systems integration. A vendor's ability to package the appropriate hardware and customize software for a specific manufacturing application can provide a significant market opportunity. As stated previously, the vendor of standardized software is not able to deeply penetrate this industry sector because of the diversity of requirements, even within the same subindustry.

Custom Software

- Coincident with systems integration is the industry's requirement for customized software. This mode differs from systems integration only in that customized software development assumes that the customer already has hardware in place, as opposed to requiring the vendor to deliver both the software and the hardware.

Consulting

- The diversity and complexity of various manufacturing applications often dictate the need for a consulting project prior to the development of custom software or the implementation of a systems integration project.

- These consulting assignments can be discrete and separate from the development of the software or the integrated system, or they can be looked upon as a continuum, leading to the delivery of the final product.

- Many customers insist that the consulting project be performed by a vendor other than the vendor who will develop the software or provide a turnkey system. In their opinion, this provides a valuable check and balance on the integrity of the system.

4. Major Vendors

Electronic Data Systems (EDS) is one of the largest and most important vendors of information services in the U.S. For the past several years it has been a subsidiary of General Motors. In the past, most of its expertise has been in the facilities management area, particularly with various Blue Cross/Blue Shield organizations. Its acquisition by General Motors has enabled EDS to become a major vendor of services to the manufacturing industry.

Boeing Computer Services (BCS) is a wholly owned subsidiary of the Boeing Company. BCS is, in effect, a spinoff of the parent company's MIS organization. BCS's major client continues to be its parent company although it has also penetrated the manufacturing industry in general in a very significant way. BCS has not had a successful acquisition program, therefore its product line lacks diversity.

McDonnell Douglas Automation Company (McAuto) is very similar to BCS in that McAuto is a spinoff of McDonnell Douglas's MIS department. McAuto is far more diverse than BCS in that it has entered a great variety of industry segments through acquisition. However, manufacturing continues to be one of McAuto's primary market segments.

B

Process Manufacturing

1. Industry Characteristics

Process manufacturing is the sixth largest market for industry-specific information services. It also ranks as the fourth largest market for professional services.

The industry contains a diverse set of subindustries, including oil and gas exploration companies, food processors, chemical concerns, and primary metal producers as well as a variety of other types of firms.

This industry group contains firms that have similar characteristics: they manufacture a product in a bulk process, they use continuous flow processes, their manufacturing process is normally a high volume, highly automated process.

In addition, process manufacturing implies a process with high throughput, a distinctive pattern to the production process, and a high degree of vertical integration between successive stages in the manufacturing process.

Process control equipment tends to be very specialized.

Companies in the process control industry are highly capital intensive, with a high ratio of capital to labor.

2. Key Applications

Process Control
Production Variance Reporting and Response
Production Planning
Capacity Load Balancing
Maintenance Scheduling
Market Intelligence System and Subsystems

3. Key Delivery Modes

Systems Integration

- As in the discrete manufacturing industry, systems integration provides the greatest opportunity for the vendor of professional services.

- While not as diverse as the discrete manufacturing industry, process manufacturing companies frequently require highly customized integrated systems.

Consulting

- In order to properly integrate automated systems in a high-volume process control environment, it is first necessary to understand the manufacturing environment and then relate computer technology to the requirements of the industry sector. Highly specialized consulting firms have been formed to concentrate in these areas. While it is common for a process manufacturing company to have highly skilled specialists on their own staff, the precedent for employing outside consultants is well established.

Custom Software/Education and Training

- These two delivery modes are of significance within the process control industry but do not represent the same revenue potential as the two modes identified previously.

4. Major Vendors

Martin Marietta Data Systems is a spinoff of the MIS department from the Martin Marietta Corporation. These data centers are basically those which were associated with the parent company's Department of Defense contract work. Since the original spinoff in the early 1970's, Martin Marietta Data Systems has made a number of acquisitions, enabling the company to enter a variety of market segments. However, as is the case with the other aerospace spinoffs, the manufacturing industry continues to be one of the company's primary revenue sources.

Computer Science Corporation (CSC) was one of the early major independent computer service companies. Originally, CSC was primarily oriented toward providing services to the Federal government. The Federal government is still CSC's major client; however, CSC now serves clients in almost every industry sector. CSC is primarily a professional services vendor in spite of earlier efforts in the remote and batch services areas.

Electronic Data Systems (EDS).
General Electric Information Systems Company (GEISCO).

C

Utility Industry

1. Industry Characteristics

The utility industry is divided into three major segments:

- Electric.
- Gas.
- Water and Sewage/Waste Disposal.

The utility industry is highly regulated, differentiating its characteristics from the many of other industrial sectors.

The computer systems used in the operations side of utility applications combine real time process control applications with engineering and technical simulation.

Because of the highly regulated nature of the utility industry, the financial and administrative applications combine business-oriented information with state and Federal regulatory compliance applications.

The utility industry is currently going through a period where there is significant hardware and software obsolescence occurring.

2. Key Applications

Billing
Cost Allocation
Property Records
Inventory Management
Cash Management
Route Management and Analysis
Process Monitoring and Control
Simulation
Capacity Planning
Environmental Hazard Monitoring and Reporting

3. Key Delivery Modes

The characteristics of the utility industry are very similar to the characteristics of the process manufacturing industry as far as overall professional service delivery modes are concerned (see B, above).

4. Major Vendors

Energy Incorporated (EI) is a relatively small, independent computer service company. It is primarily oriented toward providing service to the utility industry; the majority of its revenues are gained from this industry. While small in comparison to many of the other computer service vendors described in this report, it is considered to be a primary vendor of professional services to the utility industry.

Babcock & Wilcox Computer Services is, as the company's name implies, a wholly owned subsidiary of the Babcock & Wilcox Company, a manufacturer of heavy industrial equipment. The parent company saw an opportunity to leverage its professional services skills and formed Babcock & Wilcox Computer Services Company. While this company is relatively small, it also has become a strong influence in the utility industry as a vendor of professional services.

CAP GEMINI (the full name is CAP GEMINI DASD, Inc.) represents the United States subsidiary of CAP GEMINI Sogeti, an international group of approximately 30 computer service companies, all engaged in providing some form of professional services. The parent company is headquartered in Paris and maintains offices in most of the industrialized countries. CAP GEMINI supplies services to the utility industry on a worldwide basis.

General Electric Information Systems Company (GEISCO).
General Research Corporation.
Digital Systems Inc.
Tres Computer Systems.

D

Finance

1. Industry Characteristics

The financial industry sector is the most highly regulated industry sector in the United States. Regulation normally implies a high degree of standardization and, in a sense, this is true. However, because of competitive pressures, financial institutions are beginning to show great diversity in their marketing and operations and in their information systems requirements.

These same competitive pressures are creating the requirement for product diversification. Most new financial industry products require the

support of new, innovative information systems. These new products and systems, in turn, generate the need for a variety of professional services.

These competitive pressures are creating a note of instability in the financial sector, a level of instability that was rarely found in the past. For example, major banks such as Continental Illinois and The Bank of America have been on the verge of bankruptcy. More recently, there have been a series of major failures of savings and loan institutions throughout the U.S., particularly, in Texas.

At this time, there is a marked industry trend reflecting a consolidation of financial institutions throughout the United States. This consolidation is characterized by the following types of events:

- Commercial banks acquiring savings and loans.
- Interstate banking.
- Major banks acquiring smaller banks and bank holding companies, on both an intrastate and interstate basis.

There had been considerable pressure on congress to loosen, or repeal, the Glass-Steagall Act. The recent (October, 1987) market crash has reduced these pressures, and it would seem that, at least for the time being, the Glass-Steagall Act will remain in place, ensuring the separation of banking and brokerage organizations and activities.

2. Key Applications

The focus on the financial industry is primarily on commercial banks. Therefore, the key applications are within the context of commercial bank applications.

Most banks try to distinguish themselves as being different in the eyes of their customers. A primary way of doing this is to develop unique approaches to providing Automated Teller Machine (ATM) services. Therefore, the development and implementation of ATM networks constitutes a major financial application.

Security applications within commercial banks is also an area which is gaining increased attention. The more common the use of bank cards and ATMs, and the more complex the services offered by banks, the more

subject these various transactions are to fraud and embezzlement. Increasingly, customized computerized systems are used to either detect or prevent fraud.

Customized applications software, allowing a combination of various types of applications, is becoming increasingly important in the finance sector as financial institutions find increased competitive pressures and the need to be innovative in their approach to customer services.

3. Key Delivery Modes

Systems integration.

As branch offices become more autonomous and have the responsibility for a full range of customer services, greater use will be made of standalone "turnkey systems" at this level.

While a significant amount of autonomy has been granted to branch management in providing financial services, there is still a strong trend to centralized information processing at the corporate level. This implies the need for networking within the institution's complex of branches and the corporate data center.

As in almost every other industry, the use of personal computers is becoming extremely common within the financial industry. Personal computers have become common not only within the corporate organization, but within the management and administration functions at the branch level.

4. Major Vendors

Automatic Data Processing (ADP) is a full-service vendor to commercial banks and savings and loans. ADP is a vendor of ATM network services, and also a vendor of payroll services through commercial banks to corporate payroll customers. While ADP is not, in itself, a vendor of professional services, its pervasive position as a vendor of computer services to the financial industry has created a follow-on market for ADP to provide customers with customized software and turnkey systems.

Systematics, Inc. is a vendor of software and services to the financial industry. Because of the diversity of requirements in the financial indus-

try, Systematics has become as much a vendor of custom software as it is of packaged software.

Arthur Andersen and Company, through its management consulting division, has become a major vendor of both consulting services and custom software to the financial industry sector.

E

Securities Industry

1. Industry Characteristics

As is the case with the banking industry, the securities industry is highly regulated. Therefore, the computer applications within the brokerage industry have been standardized and are fundamentally the same from one securities firm to another.

As in the banking industry, the securities industry has been forced by competitive pressures to diversify its product line. This diversification has, in turn, required additional information systems support and has opened a newly expanded market for professional services.

The types of products offered by securities firms have expanded dramatically in the past five to seven years. As with any pattern of diversification, these activities have led to the need for additional professional services.

The recent "bull market" on Wall Street enabled newer, smaller firms to enter the securities market and find a market niche. However, the crash of October, 1987, has shaken the foundations of the "bull market" and may make the competitive position of the smaller firms in the securities industry more precarious.

Any further sudden contraction of the market for securities in the United States will, in all probability, cause a "shake-out" to occur in the securities industry. As with the banking industry, this shake-out would probably mean the consolidation of many of the newer, smaller firms into the more stable, larger securities organizations.

The diversity of financial products within the securities industry has led to the need to provide customers with more detailed information concerning their individual portfolios. This trend, together with other competitive pressures in the industry, has further led to the need for much greater computer system support of the individual broker in enhancing his ability to deal with customers.

2. Key Applications

Centralized Portfolio Management.

Each securities firm wishes to appear different, and better, than its competitors. This differentiation often manifests itself in an attempt to provide a unique and comprehensive portfolio reporting service.

New Product Support.

Each securities firm continues to introduce new products, or combinations of products, in an attempt to gain new customers. These new products generally require unique computer support, either on a mainframe, turnkey, or PC basis.

Each new product introduced by the securities industry implies a requirement for new regulatory reporting. This additional reporting, in turn, generates the need for additional computer applications.

3. Key Delivery Modes

While the primary securities industry applications are supported by large mainframe computers, the professional services opportunities in the industry are more likely to be oriented toward turnkey mini- and microcomputer-based systems.

Consulting projects associated with various new products and computer applications in the securities industry are a growing part of the professional services activities in this industry.

Systems integration projects, combining customized software with minis and microcomputers, in support of increased branch activities and new product introductions, are also a growing part of the professional services aspect of the securities industry.

4. Major Vendors

Electronic Data Systems.
General Electric Information Systems Company (GEISCO).
Automatic Data Processing (ADP).
Arthur Andersen and Company.

Price Waterhouse.
Peat Marwick and Mitchell.
Unisys (SDC).

F

Distribution

1. Industry Characteristics

As defined by IBM, the distribution sector includes both wholesale and retail distributors.

Wholesale distributors have become significant users of all types of software: mainframes, minis, and microcomputers.

The use of various types of computer systems and digital communication networks has allowed wholesale distributors to adapt their modes of operation to the peculiarities of the industry that they service. These various adaptations have led to a rapidly increasing market for customized software in the wholesale distribution industry.

Turnkey systems have always been, and will continue to be, an important part of the wholesale distribution industry.

In the retail distribution sector, the requirement for advanced inventory control systems and the support of point-of-sale terminals have become important factors in the market for professional services.

There is a direct link between point-of-sale systems and inventory control systems. Each retailer seems to look upon his requirements for these combined systems in a different way.

Even small retailers have, through competitive pressures, been forced to automate their operations. While the small retailer normally cannot afford professional services, it may still be necessary for them to install one or more turnkey systems.

2. Key Applications

Wholesale distribution

- Inventory control.
- Billing and accounts receivable.
- Automated stock replenishment.

Retail distribution

- Point-of-sale.
- Inventory control.
- Customer billing/accounts receivable.

3. Key Delivery Modes

Turnkey systems/systems integration.
Software customization.
Education and Training (through various trade associations).

4. Major Vendors

Management Science of America (MSA) is an Atlanta-based computer service company, basically known for its packaged, cross-industry software. The majority of MSA's revenues continue to be derived from the sale of packaged payroll and financial software on a cross-industry basis. However, MSA, like most vendors of packaged software, is finding that, in today's market, software must be customized for each major user. MSA has become proficient in software customization, and a significant portion of its overall revenues are derived from the retail industry.

American Software, Inc. is also based in Atlanta, Georgia. Since its founding in 1970 it has been like MSA, primarily, a vendor of packaged software, with particular emphasis in inventory control, purchasing, order processing, and receivables control. Like MSA, American Software developed a strong professional services capability in the area of software customization. It has applied this expertise to the retail distribution industry as well as the wholesale distribution industry.

GSI TRANSCOMM was founded in 1972, basically as a timesharing company. Subsequent to this time, GSI TRANSCOMM began to develop packaged software products for a variety of industries, with particular emphasis in the wholesale distribution industry. While GSI TRANSCOMM remains a relatively small company, it derives the majority of its revenues from selling and customizing applications software packages for members of the wholesale distribution industry.

MCBA.
Sentinel Computer Corporation.
CRT Distribution Systems, Inc.

G

Insurance

1. Industry Characteristics

The insurance industry is subdivided into four sectors:

- Life insurance.
- Property/casualty insurance.
- Health insurance.
- Reinsurance.

The insurance industry is highly regulated; this is true for each of the various subsectors.
While an important part of the U.S. economy, the insurance industry has been one of the least dynamic industries throughout its history.

The major competitive threat to organizations in the insurance industry is that of being acquired by other companies who are attempting to form complete financial services organizations.

Cost control, especially in life insurance and property/casualty insurance, has become an import focus for the major insurance carriers. Cost control normally focuses on the agency structure. Many insurance carriers are finding ways to reduce the number of agents and agencies through consolidation or attrition.

2. Key Applications

Because of the high degree of regulation and the relative lack of innovation in the insurance industry, there is a relatively small market for professional services activities. However, there is a limited professional services market associated with the area of New Business/Policy Issue. This area consists of the following:

- Marketing and agency commission processing.
- Marketing and agency performance.
- Client management.
- Reinsurance billing and payables.
- Alpha inquiry/client access.
- Investment accounting.

3. Key Delivery Modes

Turnkey systems.
Customized software.

4. Major Vendors

ARC/AMS, otherwise known as Agency Management Systems Inc., is a creation of a consortium of insurance companies that provide software, turnkey systems, and processing services through a variety of subsidiaries. Most of the company's revenues are derived from being a systems integrator, with particular strength in the minicomputer and microcomputer turnkey arenas.

The Continuum Company, based in Austin, Texas, provides applications software, computing services, and a wide variety of professional services to clients in the life, health, and annuity insurance industry. The Continuum Company has revenues of approximately $50M per year and is totally oriented toward the insurance industry.

Policy Management Systems Corporation (PMS) is one of the major vendors of services to the insurance industry. Its revenues are well over $100M per year, and a large percentage of these revenues are derived from professional services. However, PMS also is a major vendor of remote computer services to the insurance industry.

Cybertek Computer Products Inc.
Equifax, Inc.
ISI Systems, Inc.
Information Systems of America, Inc.

H

State and Local Government

1. Industry Characteristics

There is a strong degree of commonality in information systems applications throughout state and local government. Their functions are essentially the same; variations in function from one level of government to another are not very significant.

While state and local governments, and in particular local governments, were among the last industry sectors to automate, the degree of automation, even at the local level, is currently quite extensive.

State governments are heavy users of mainframe computer equipment and tend to be very centralized in their data processing applications. Local governments, except for major cities, are more oriented toward mini and microcomputer applications. In many cases, government applications include applications from other sectors; for example, health, education and utilities.

Because of standardization and budgetary limitations, state and local government sectors are, on a proportional basis, one of the lowest ranked users of professional services.
Whatever the application, in almost every case state and local governments are required by law to engage in competitive bidding for any type of information service, including professional services.

2. Key Applications

Tax assessment.
Tax collection and accounting.
Asset inventory and management.
Property tax record keeping.
Accounting.
Human resource and payroll.

3. Key Delivery Modes

The delivery mode for professional services varies greatly with the type of governmental organization being considered.

State Governments

- Facilities management.
- Systems integration.
- Consulting.

Large Municipal Movernments (similar to state governments)

- Facilities management.
- Systems integration.
- Consulting.
- Custom software.

Small Municipal Governments

- Systems integration.
- Custom software.

4. Major Vendors

Peat, Marwick & Mitchell (PMM), as one of the Big Eight auditing firms, has formed a strong management consulting group. As is common with the other Big Eight auditors, PMM has become a major force in supplying consulting services to a variety of industries. Because of the precedent of its auditing work, PMM supplies significant amount of consulting services to state and local governments.

Price Waterhouse & Co. is a carbon copy of PMM, also providing a great variety of professional services across almost every industry segment. Like PMM, Price Waterhouse has a large number of government audit clients and, thus, also supplies a significant amount of professional services to state and local governments.

American Management Systems (AMS) was founded in 1970 and provides a wide variety of computer services, including professional services, to a diverse client base. AMS, located in Arlington, Virginia, currently generates annual revenues of between $135M and $150M. AMS has long been a major provider of professional services to state and local governments.

Computer Science Corp. (CSC).
Electronic Data Systems (EDS).
Arthur Andersen & Co.

I

Medical and Health Services

1. Industry Characteristics

The medical and health services sector has changed dramatically during the past several years. The current emphasis on cost containment and the type of reimbursement for health services has caused great changes in the health industry itself. These changes have had, in turn, a marked affect on the information services aspect of the medical industry.

More efficient and complex information services have become more in demand in order to support the reporting associated with health care service reimbursement.

There has been an increase in the diversity of health care organizations. For example, health maintenance organizations (HMOs) together with prepaid health plans, home health agencies, and freestanding emergency centers have all added to the complexity and diversity of the health care industry.

While hospitals continue to be the primary vendor of health care services, their relative degree of importance is declining. Conversely, where the individual medical practitioner has formerly been the mainstay of the medical industry, the individual is now being displaced by group practices.

2. Key Applications

Hospital information systems.
Patient care systems.
Decision support systems.
Out patient clinic systems.
Third party reimbursement systems.

3. Key Delivery Modes

Hospitals

- Facilities management services .
- Systems integration services.
- Consulting.
- Education and training.
- Custom software.

Medical practitioners

- Systems integration (minicomputer/microcomputer).
- Consulting services.

4. Major vendors

Shared Medical Systems (SMS), based in King of Prussia, Pennsylvania, specializes in providing services to the health industry. The majority of its clients are hospitals and related healthcare institutions. More recently, SMS has recently begun to provide computer services and professional services to large group practices.

Mediflex is a relatively small service company, focusing totally on the healthcare industry They also provide a variety of services including turnkey systems, consulting services, and customized software.

HBO & Company was founded in the mid-1970's, specifically to provide turnkey systems to the healthcare industry. It has grown through acquisition and now has revenues in excess of $150M per year. In addition to providing turnkey systems to the healthcare industry, HBO also provides a variety of other types of professional services.

American Medical International.
McDonnell Douglas Automation Corporation.

J

Communications Services

1. Industry Characteristics

The communications sector, as defined by IBM, is comprised of the following types of organizations:

- Long distance telephone companies.
- Regional telephone companies.
- Radio broadcasters.
- Television broadcasters.
- Cable networks.
- Various other forms of communications services.

The communications industry has, by its very nature, always been a capital intensive industry.

The various types of communications organizations have also been early, and substantial, users of information systems services.

The breakup of AT&T and the subsequent partial deregulation of the regional telephone companies have caused the regional operating companies to be more diversified and to take on some of the characteristics of manufacturing companies.

In the television portion of the communications industry, cable television networks have become an important competitor to the traditional television networks.

2. Key Applications

Network design.
Customer billing.
Asset inventory and control.
Traffic pattern analysis.
Channel/station use statistics.
Equipment efficiency reports.
Data base information services.
Utility management.

3. Key Delivery Modes

Facilities management
Systems integration
Custom software

4. Major Vendors

AGS Computers, Inc., incorporated in the late 1960's, provides custom software and other forms of professional services as well as packaged applications software. Almost all of AGS's clients are in the telecommunications, banking, finance, and computer manufacturing industries. AGS's major clients have been AT&T and the Bell Operating Companies. The relatively newly formed Regional Bell Operating Companies are now also among AGS's clients.

Auxton Computer Enterprises Company (AUXCO) is almost totally oriented toward the telecommunications industry. In the past, AUXCO has been a major developer of packaged software, a practice which continues today. However, as is the case with other developers of packaged software, AUXCO has developed a strong capability in providing consulting and software customization services. The telecommunications industry continues to be its primary client base for packaged software as well as for professional services.

Computer Consoles Inc. (CCI). The largest single revenue source for CCI is in the area of systems integration. The majority of CCI's revenues is from companies in the telecommunications industry. It is in this context that CCI's systems integration activities have resulted in its being a major vendor of professional services to the telecommunications industry.

American Management Systems, Inc.
Computer Sciences Corporation (CSC).
Computer Horizons Corporation.
Data Architects Inc. (DAI).

K

Transportation

1. Industry Characteristics

The transportation sector is basically comprised of:

- Airlines.
- Railroads.
- Trucking firms.
- Marine transportation.
- Ancillary transportation service firms.

Deregulation has contributed to increased competition and increased consolidation within each of the transportation segments as well as causing increased competition among the various modes of transportation.

Since industry deregulation, cost containment and increased productivity, together with improved service levels, have become increasingly important in this industry sector.

The railroad industry continues to evolve toward fewer and larger railroads.

The airline industry has gone through several phases of consolidation and increased competition. The demise of Peoples Express has lead to a decrease in fare reduction pressures in the industry, and, at least temporarily, the industry is again returning to an era of fare stability.

2. Key Applications

Reservation systems.
Asset inventory and control.
Passenger ticketing.
Scheduling.
Statistical and revenue reporting systems.
Data base services

3. Key Delivery Modes

Systems integration.
Custom software.
Consulting services.

4. Major Vendors

Comdata Network Inc. is based in Nashville, Tennessee. Its revenues are approximately $100M per year, all derived from the trucking industry. The company basically provides money transfer services to the trucking industry and to credit card holders, truck drivers, and motorists through more than 7500 truck stops and motels.

CASS Information Systems also provides services to the trucking industry. Basically, these services consist of a variety of types of systems integration projects oriented toward micro and minicomputers.

Cogito Data Systems provides custom software and processing services to those organizations that maintain large fleets of vehicles.

Trans Tech Services Inc. provides data base services to common carriers and private carriers.

National Data Corporation.
Fundsnet Inc.

L

Media

1. Industry Characteristics

The media sector, as defined by IBM, consists primarily of the following subsectors:

- Printing and publishing.
- Motion pictures.
- Amusements.
- Membership organizations.

With the exception of the printing and publishing subsector, the media sector does not evidence significant dynamics for vendors of professional services.

The printing and publishing subsector has many of the same characteristics as the discrete manufacturing sector.

This sector is characterized by a large number of small organizations generating the minority of the sector revenues and a small number of large organizations generating the majority of the revenues.

By far the largest single subsector in the media sector is newspaper publishing. Newspaper publishers have long been significant users of automated production equipment as they have attempted to reduce the cost and influence of highly paid, labor intensive, craft union employees.

2. Key Applications

Automated production control.
Mailing list maintenance.
Circulation control.
Membership list maintenance.
Automated typesetting.

3. Key Delivery Modes

Customized software.
Systems integration.
Consulting services, in the context of defining applications for specialized information systems.

4. Major Vendors

Planning Research Corp. (PRC) is based in the Washington, DC area and was originally a Federal government "think tank." The company was founded in 1965 and currently has overall revenues approaching $400M. Since its founding as a think tank, PRC has been successful in applying its expertise to commercial customers. PRC currently provides a great variety of professional services to the printing and publishing sector of the media industry.

Ernst & Whinney (E&W) is another CPA firm that has been successful in developing a strong management sciences area. Because of its audit practice client base it has found an easy entry to providing consulting services throughout the media industry, with particular strengths in printing, publishing, and broadcasting.

Creative Data Systems (CDS). INPUT does not have any significant detailed information concerning CDS. It is a relatively small company but apparently provides a significant amount of professional services to the printing and publishing industry. The majority of these services consist of consulting and customized software development.

Arthur Andersen and Co.

M

Consultants

Business consulting is a fragmented subsector. It is characterized by a small number of large companies and a large number of small companies.

Business consulting, and strategy consulting in particular, has developed into a highly sophisticated technical field during the last 20 years.

The mathematical modeling of various aspects of the economy and extensive statistical analyses are an important segment of the consulting subsector. The consulting subsector is, within itself, a significant user of on-line data base services.

2. Key Applications

Customized on-line data base services.
Customized software for modeling and statistical analyses.
Time and billing applications.
General office automation.

3. Key Delivery Modes

Customized software.
Education and training.
Systems integration; the combination of customized software on mini and microcomputers.

4. Major Vendors

There is no known major vendor of professional services to consulting firms. By their very nature, these firms are, in themselves, vendors of professional services.

Therefore, this sector is not viewed as a viable market for professional service vendors.

N

Higher Education

1. Industry Characteristics

Most post-secondary institutions are in a period of consolidation as a reaction to meeting significant budgetary and cost constraints.

Most four-year colleges and universities now adopt aggressive marketing techniques in order to attract good students and faculty members.

As most four-year colleges and universities are now funded, in one way or another, through state and Federal sources, reporting requirements have increased significantly for these institutions.

The administrators of most post-secondary educational organizations are aware that computer literacy is an important part of student education. However, their approach to providing computer literacy is often fragmented and uncoordinated.

Two-year colleges and vocational schools are also increasing their attempts to provide their students with various forms of computer literacy. Courses at these institutions are on the vocational level and are frequently developed, and offered, in cooperation with local industries.

2. Key Applications

On-line data base access.
Mathematical modeling and statistical analysis.
On-line data base development and maintenance for general administrative purposes.
Computer aided instruction.
General administrative applications including state and Federal government reporting.
Library applications.

3. Key Delivery Modes

Customized Software

- Related to all of the key applications listed above.
- Consulting in relation to the development of customized software and turnkey systems.

Systems Integration

- Relative to computer aided instruction and mathematical and engineering applications.

4. Major Vendors

Systems and Computer Technology Corp. SCT was founded in 1968 and is located in Malvern, Pennsylvania. It provides a great variety of professional services to government, educational institutions, trade associations, and, to a lesser degree, private industry, especially facility management services to educational institutions as well as consulting services and customized applications software.

American Management Systems, Inc. (AMS). AMS, located in Arlington, Virginia, provides professional services as well as processing and

micrographic services to the Federal government, state and local governments, and educational organizations. Its revenues are approximately $140M per year. It is a strong influence in the educational marketplace and provides consulting services, and as customized applications software to a great variety of educational institutions.

DATATEL, also located in Alexandria, Virginia, was founded in the late 1960s. It develops both packaged and customized applications software for educational institutions, local governments, and other not-for-profit organizations. As with AMS, DATATEL is a major vendor of consulting services and customized application softwares to institutions of higher education.

O

Schools

1. Industry Characteristics

The educational services sector primarily consists of:

- Elementary schools.
- Secondary schools.
- Vocational schools.

There has been a dramatic increase in the use of computers, in the academic sense, in both primary and secondary schools throughout the United States; 42% of the high schools in the U.S. use computers in their academic curriculum. Approximately the same percentage of junior high schools also use computers in their academic curriculum.

A significant number of high school and elementary school systems are utilizing computers for administrative purposes.

Vocational schools are also using computers for both academic and administrative functions.

School systems at the elementary and secondary levels are prone to form cooperatives so that they can better take advantage of computer systems for academic purposes.

2. Key Applications

Administrative Applications

- Student scheduling .
- Instructor scheduling .
- Admissions .
- Alumni information .
- Student recordkeeping.

Academic Applications

- Student instruction .
- Test scoring .
- Test score interpretation .

Library Automation

- Catalog maintenance and information retrieval .
- Circulation control .
- Text search and retrieval.

3. Key Delivery Modes

Customized software, both administrative and academic.

Consulting, both administrative and academic.

Systems integration — microcomputers for academic purposes and - minis and microcomputers for administrative purposes.

4. Major Vendors

Cogito Data Systems Inc. is located in Princeton, New Jersey. In the early 1980's, Petroleum Data acquired Cogito, shed its petroleum related business, and renamed itself Cogito Data Systems Inc. Cogito provides a variety of services to secondary schools and school boards. It provides processing services, turnkey systems, and a full range of professional services to school boards throughout the U.S. and Canada.

On Line Computer Library Center (OCLC) is a relatively small, but highly specialized, consulting and computer service company. As the

name implies, OCLC provides on-line library services to both the educational market and libraries operated by state and local governments. While the company is not a major professional services vendor, from the perspective of its overall revenues, it has a significant impact in providing library-related professional services.

Pentamation Enterprises Inc. is located in the Allentown/ Bethleham, Pennsylvania area. Pentamation was founded in the late 1960's and has, over the years, provided a variety of computer services to industries in the eastern Pennsylvania/northern New Jersey area. More recently, Pentamation has expanded both its geographical market and its industry markets. It provides a variety of processing services, consulting services, and customized
software services to a large number of school systems throughout the northeastern United States.

Computer Curriculum Corporation.

P

Federal Government

1. Industry Characteristics

It is expected that the Federal Government market for professional services will continue to grow but that the rate of growth will be slower as a function of deficit reduction efforts.

While heavily automated, the Federal Government's data processing activities are traditionally behind the state-of-the-art that exists in the private sector.

The Federal Government is a heavy user of third-party services and professional services as well as other types of data processing services.

Penetrating the Federal Government marketplace presents opportunities and challenges that are significantly different than comparable efforts in the private sector.

Most significant government expenditures for data processing products and services are based on competitive bids.

Because of the size of the Federal Government sector and the amount of money that is being spent by the Federal Government, it is a highly competitive sector for vendors of professional services (as well as vendors of other types of information services).

2. Key Applications

The applications pertaining to the Federal Government are as diverse as the government itself. It would be virtually impossible to compile a comprehensive list within the context of a report such as this.

Virtually all Federal Government agencies are potential markets for the vendors of professional services. Without exception, each major agency is a significant purchaser of third-party professional services.

3. Key Delivery Modes

Again, because of the size and diversity of the Federal Government, all professional service delivery modes represent a significant opportunity for professional service vendors.

The Federal Government encompasses virtually all of the private sector applications and delivery modes. However, in addition, the Federal Government is a significant purchaser of professional services facilities management services.

Programming and analysis and custom software are forecasted to be the largest submodes of professional services.

Consulting services are primarily oriented toward assisting the various Federal agencies in their technical justification for improvements in information technology.

Education and training services are primarily oriented toward teaching Federal employees the dynamics and details of sophisticated state-of-the-art data processing techniques.

The majority of the Federal Government expenditures for systems integration projects (approximately 67%) will be related to the Department of Defense.

While professional service facilities management services are more significant in the Federal Government sector, they are still expected to be the slowest growing portion of Federal Government professional services.

4. Major Vendors

Computer Sciences Corp.
Electronic Data Systems.
Boeing Computer Services.
Planning Research Corp.
McDonnell Douglas Information Systems Group.
Informatics (Sterling Software).
Dynalectron Corp.
General Electric Information Services Corp (GEISCO).

Professional Services Market Overview— By Delivery Mode

III

Professional Services Market Overview—By Delivery Mode

This chapter describes the professional services marketplace in the context of the various delivery modes that are encompassed by professional services. Each of the five professional services delivery modes are reviewed from the vendor's perspective. These delivery modes are:

A. Consulting Services.
B. Custom Software Development.
C. Education and Training.
D. Systems Integration.
E. Professional Services Facilities Management (PSFM).

It should be noted that a portion of the information contained in this chapter has been extracted from several recent INPUT reports that are pertinent to the Professional Services Market.

A

Consulting Services

Consulting involves professional staff members who advise clients on computer-related issues that are usually management oriented. Feasibility studies and computer audits are examples of some of the services provided.

The consulting mode of the professional services market will account for 16% of total market revenue in both 1985 and 1990. It is the second largest professional services mode, and expenditures will more than double between 1988 and 1993.

In 1986, the commercial portion of the consulting market was 82% while the Federal Government portion was 18%. In 1993, these percentages are expected to change to 93% commercial and 7% Federal Government.

Another way to look at the consulting market is that, in 1986, 18% of the commercial market will be from professional services consulting revenues; in 1993 it will be 21%. This is opposed to the Federal government segment in which the consulting portion will be 11% in 1986 and 8% in 1993. This market share difference can be explained by the fact that top management in the commercial segment has historically taken a more sophisticated approach to data processing than has the government segment. Commercial's more professional outlook favors the use of outside consultants, with their advanced tools and skills.

About five years ago, the Federal Government began to become more sophisticated from an IS management point of view. As a result, they, too, are now more accepting of professional services consultants. The large headstart in consultant acceptance by the commercial segment accounts for the commercial versus Federal Government market share differences.

Factors impacting the consulting market are:

- The trend of software product vendors to solicit, and "Big Eight" firms to respond to, consulting and installing software products at users' sites. A major example of this is Computer Associates International (CAI) Micro Products Division's "qualified installer" program, under which "Big Eight" and smaller accounting firms recommend, install, and train clients on the company's accounting packages. Through this program, the accounting firms receive referrals from retailers and then contact users directly but do not sell the software themselves. This procedure provides additional professional services consulting opportunities for accounting firms as well as aiding CAI by providing an easy means of supporting its dealers, while giving their software a quality endorsement. There are many other examples of these types of arrangements.

- The increasing desire of management to automate "the heart" of the business leads to the need for more complex hardware, software, and communication solutions. The need for professional services consulting at all system development stages, from conception to implementation, is becoming a cost-effective necessity rather than an afterthought.

There is a proliferation of IS consulting businesses. Over 2,000 companies and 7,000 independents are listed in the J. Dick & Company's comprehensive directory. There are regional pockets of small consulting business in such areas as Washington (DC), Dallas, Boston, and the San Francisco Bay Area. Technical professionals are "going independent"

and reselling services to their former IS employers. This trend has caused the State of California to consider legislation that would classify such independents as "employees" for tax purposes.

Consulting associated with telecommunications is building rapidly, although from a small base. Many services formerly provided through the "Bell System" are now being turned over to a cadre of consultants and professional services firms working on a referral basis through AT&T Communications and the RBOCs.

IS management uses consultants to save time and avoid mistakes. The buyer's problem is that there are too many alternatives and too many "experts" who only look good on paper. Buyers are struggling with how to gauge the consultant's depth of knowledge and quality of performance. These buyers do not want to trade off internal staff trial-and-error programs for the trial-and-error from a consultant.

This concern favors established professional service firms over the local independents. Referrals, references, and prior track records all help the buyer make the decision in choosing among consultants.

B

Custom Software Development

The software development mode of the professional services market develops software on a custom basis. It generally includes user requirements, system design, and/or programming.

Software development will be the largest segment in both 1986 and 1993, with about 40% of total user expenditures. In 1993, the user expenditures from this mode will more than double from what they were in 1986.

Approximately 60% of the commercial market in 1986 was for software development. In 1993, this percentage is expected to decrease to 43%.

In the Federal Government segment in 1986, 30% of the professional services revenues were for software development, forecasted to decrease slightly to 29% of Federal government professional services revenue in 1993. These percentages will stay relatively constant since both the consulting and the education and training modes of the market will continue as strong growth modes on their own, with AAGRs equal to, or greater than, software development.

Factors impacting this market:

- As end users become more sophisticated in terms of computing, they will increasingly be able to conceive of, and define, more complex systems to be developed, thus further expanding professional services opportunities.

- With the trend toward integrated applications, data base design will become increasingly more important, but also more complex. Many companies will lack the internal skills for this activity and will therefore look to professional services vendors for help.

Many mainframe/mini software product vendors are porting versions of their large software products to micro versions i.e., Information Builder's PC-Focus. These products, in most cases, will be used by nonprogrammers and will therefore require better documentation. Opportunities exist for more sophisticated professional services documenters to write better manuals for these less sophisticated users.

Increasingly, custom software developers, in order to enhance profit margins, are developing new business in the following ways:

- Application/industry business in areas such as security, telecommunications, and planning.

- Product-associated customization such as what Hogan Systems does for banking.

- Multi-application integration such as what Arthur Andersen & Company does for grocery stores.

- Through referrals from established product suppliers such as IBM, AT&T, and Cullinet.

There is a significant benefit in specialization. This approach creates an experience base for consulting, training, and ongoing support.

The largest, and fastest growing, of these markets is in banking services (banks and thrifts). The factors driving this market are deregulation, competition, and consolidation. These factors put pressure on IS departments to offer new services in very short timeframes.

Many professional service firms are looking for some way to "productize" the software development business. One approach by Arthur Andersen & Company is to integrate services with the sale of its "Programmer's Workbench" productivity tool. McDonnell Douglas's ISG offers Stradis and now PC Stradis integrating consulting and training with a standard system development methodology.

C

Education and Training

Education and training services help people acquire new skills, techniques, or knowledge related to computers. This mode of the professional services market does not include services to educational institutions.

Stimulating the education and training markets are factors such as:

- The rapid changes in hardware, software, and communications technology that quickly render obsolete current knowledge of the best ways to develop, install, and use automated systems.

- The growing complexity of software development tools which, in turn, increases the need for the training of programmers and analysts.

One major factor that is preventing this market from having an even higher growth rate is the increasing role of automation in the training process (i.e., CD ROM combined with software).

From a market size perspective, this mode is only one-sixth the size of the software development segment, but will grow to become about one-fourth its size in 1990 and beyond.

Eleven percent of the commercial market professional service revenues, in 1986, was for education and training. In 1993, this percentage is expected to increase to 14%. In the Federal Government segment, in 1986, the education and training percentage was 8% of the total, decreasing slightly to 7% in 1993.

Eighty percent of the education and training expenditures in 1986 were from the commercial marketplace; 20% from the Federal Government. In 1990, the commercial market will consist of 90% of the total; the Federal Government market will be 10%.

The major factors stimulating the growth of this marketplace include:

- The increasing number of microcomputers that are being placed on workers' desks; most of these workers have little or no computer experience.

- Rapid technological changes that obsolete old systems and software, stimulating the need to retrain personnel on new products.

CBT (Computer Based Training) is becoming a significant part of the operational training programs in American industry. CBT is becoming acceptable to executives, senior management, and the in-field work force. It can be used at home during non-prime work hours and at a self-paced rate.

CBT is expensive to develop. First, good CBT programs require a dedicated group of experienced professionals. CBT is definitely not for well-meaning amateurs. Second, CBT takes time. It takes from 30 to 40 hours of programming to create one hour of instruction. For a six-hour course, that could be six weeks of programming. Once completed, however, changes can be made in a very small fraction of the development time. This is important for equipment maintenance training (trucks, autos, jet engines, office, and computer equipment) where engineering and part changes are a continual occurrence.

For IS groups, there is an opportunity to provide "train-the-trainer" services. This can also be an additional market for CBT courseware to support the in-house staff on an ongoing basis.

- From a recent survey of 1,080 IS information center managers, only 5% had trainers on staff within the first six months of operation. Within three years, over 50% of the information centers included end-user trainers on staff. An additional 36% were planning to add such skills to their information centers.

- The major problem that the managers of these centers face is finding the combination of user friendliness, technical competence, and training experience necessary for success. This opens the opportunity for train-the-trainer programs to offer computer-assisted screening services for staff selection.

D

Systems Integration

Systems integration is a process in which a vendor assumes total responsibility for providing the information products/services which result in a comprehensive solution to an information systems problem. In this process, the customer-integrator arrangement is such that the customer is made to feel that one vendor is providing all aspects of the solution. The customer interacts with the systems integrator and, to the extent possible, other vendors who may be subcontractors to the integrator for portions of the solution that are transparent to the customer.

In 1986, the systems integration market for the Federal Government (approximately $900 million) was almost as large as the Federal software development market. By 1993, with a 1.8% AAGR, systems integration will be about the size of the overall Federal Government professional services market in 1985 — systems integration will be $2.7 billion in 1993; total Federal Government professional services was $2.78 billion in 1985.

Factors stimulating the systems integration marketplace include:

- Scarcity of skills within any one vendor for developing a total, complex automated solution.
- The proliferation of technological options which produce buyer confusion and system compatibility challenges. A single systems integration vendor, to coordinate compatible procurement and connectivity, becomes increasingly necessary.

Commercial systems integration (SI) is in an embryonic stage. The factors that are stimulating the SI Federal Government segment hold true for this segment as well.

Systems integration in the commercial sector could become the fastest growing segment of PS business. Measuring SI revenues is difficult because it includes design, project management, custom software development, user training, and mark-up on third-party hardware, software, and communications. However, it is forecasted to show the greatest AAGR (30%) from 1986 to 1993.

On-line systems account for most of the functional SI business. This includes:

- Telecommunications systems operations, monitoring, and management.

- Data entry and retrieval subsystems for customer services (ordering and maintenance).

SI firms have the following advantages over product companies:

- Lower profit margins, in the 10-15% range.
- No R&D efforts to support.
- Lower G&A and overhead rates.
- Economies of specialization in both sales and support.

Mainframe manufacturers have not been aggressive in producing integrated DBMS and data communications systems. This leaves the door wide open for SI to implement micro-mainframe links.

Turnkey network implementation is a growth opportunity for SI. There are an estimated 12,000-18,000 private networks in operation in the U.S. They are now increasing at a rate of 20% a year since divestiture and deregulation of AT&T.

AT&T now finds itself in competition with its RBOC family for various types of business, which include:

- Network design.
- Component evaluation.
- Implementation management.
- Problem diagnosis.
- Service quality monitoring.
- Network optimization.
- Vendor service coordination.
- Vendor contract management.

These functions can be readily combined with network FM to increase the value of a contract and provide a recurring revenue base after implementation.

E

Facilities Management

Professional services facilities management (PSFM) is a counterpart to the processing facilities management market, except that, in this case, the computers are owned by the client, not the vendor. The vendor provides human resources to operate and manage the client facility.

The facilities management segment of professional services is now, and will continue to be, the smallest professional services segment. As

vendors become more skilled at financing hardware acquisitions, clients will tend to favor the vendor-owned hardware FM approach, which is classified by INPUT as processing services FM.

Two percent of the commercial professional services market in 1986 will be FM sales; declining to slightly more than 1% in 1993. The Federal Government segment has a much different segment breakdown—23% from FM sales in 1986 and an expected 18% in sales from professional services FM in 1993. This is due to the fact that historically the government has had "deeper" pockets and could more easily finance their computer acquisitions.

In the Federal Government segment, vendor trust is especially important. Size of the professional services vendor, familiarity, and longevity are all contributing factors to this trust.

To date, facilities management in the commercial sector has been very small compared with the government sector. The focus has been on data center operations, and most commercial firms do not want to turn over their data centers to outsiders. There are, however, new types of FM contracts being signed for operation of special function systems.

A recent example of professional services FM is the contract between EDS and General Foods for operation of an on-line order processing network and center. EDS is also making a bid to provide FM for the management of dedicated data communications systems supplied by GTE Telenet. EDS manages the implementation of the network based on Telenet equipment and AT&T circuits, then provides ongoing operation of the network control center and coordinates maintenance of the many network components and services.

In the area of telecommunications systems, FM becomes an incremental offering to systems implementation and integration.

F

Leading Professional Service Vendors By Delivery Mode

1. Consulting Services

A. D. Little.
Martin Marietta Data Systems.
Arthur Andersen & Company.

2. Custom Software Development

Computer Sciences Corp.
DBA Systems.
Arthur Andersen & Company.
Computer Task Group.
Computer Horizons.

3. Education and Training

Computer Process Co.
Computer Sciences Corp.
McGraw Hill Information Services.
Deltak/Prentice Hall.
ASI.

4. Systems Integration

Arthur Andersen & Company.
Electronic Data Systems (EDS).
Control Data Corp. (CDC).
Boeing Computer Services (BCS).
Systems Control Corp. (SCC).

5. Professional Services Facilities Management

Electronic Data Systems.
Martin Marietta Data Systems.
Pinkerton Computer.
Computer Sciences.

IV

Conclusions

IV
Conclusions

The total professional services market is expected to show significant growth from 1986-1993, virtually quadrupling in size.

While the professional services marketplace will show significant growth, it is apparent that it is a highly competitive field with hundreds of companies competing for professional services revenues, both in the commercial sector and in the government sector.

The most promising modes of delivery for professional services are:

- Customized software.
- Systems integration.

The other three professional services modes are education and training, consulting, and professional services facilities management.

With the possible exception of ten or twelve large professional services vendors, the professional services market is typified by a large number of small, specialized vendors.

Many of the firms providing professional services offer them as an adjunct to other types of services outside the professional services field.

In the past, and still today, professional services were looked upon as a means to an end. That is, professional services were often looked upon as a way of enhancing the sale of hardware or off-the-shelf software. The professional services marketplace is typified by being a labor-intensive business. Profit margins, in the past, have never been as great for those firms offering professional services as they have been for those firms providing other types of information systems, products, and services.

Conversely, the existing, and the predicted, skilled labor shortages in the information systems field will not only cause problems for professional

services firms but will certainly create opportunities for these firms as their clients and potential clients suffer from the same effects of labor shortages.

There is a nationwide industry trend for organizations to use outside services in lieu of building internal resources. This trend can only have a beneficial effect on professional service vendor firms.

As in any highly competitive business, it is vital for the professional services vendor to create an image that sets his firm apart from the competition. Entering a professional services marketplace with a "me too" approach cannot be a successful strategy in today's marketplace.

Appendix: Tables

A

Appendix: Tables

The appendix contains a series of tables that present the primary data associated with this project. The tables are listed below and are briefly described.

Table 1 **INPUT Forecast With Inflation By Industry Mode**
This table is identical to previously published INPUT data, except that the 1993 forecast data has been added.

Table 2 **INPUT Forecast Without Inflation By Industry Mode**
This is the previously published INPUT forecast data, but changed by removing the effects of inflation, as predicted by INPUT.

Table 3 **IBM Forecast Without Inflation By Industry Mode**
This information represents the repackaged, or restructured, forecast data, presented by industry segment, as defined by IBM. Please note that Table 6 contains the basic "crosswalk" guidelines that were used in the restructuring process.

Table 4 **IBM Forecast With Inflation By Industry Mode**
This table is analogous to Table 2, but with the inflation factors, as defined by IBM, added to each cell.

Table 5 **IBM Forecast With Inflation By Mode of Delivery**
This table contains the same data as presented in Table 4, but is shown by mode of delivery (within the context of professional services) as opposed to the industry segment data contained in Table 4.

Table 6 **IBM Forecast With Inflation by Industry and Mode of Delivery**

This table is similar to Table 5 except that service mode forecasts are presented by industry.

Table 7 **Industry Sector Crosswalk**

This table illustrates the basic approach that was taken in restructuring the data presented in Table 1 into the data presented in Table 2. In order to understand the intent of the information contained in the table, it should be viewed from the perspective of the IBM sectors. For example, the IBM-defined manufacturing sector is comprised of data from INPUT's:

- Discrete manufacturing sector.
- Distribution sector.
- Services sector.
- Other Industries sector.

Additionally, for example, IBM's Transportation Sector is comprised of data from INPUT's:

- Transportation sector.
- Services sector.
- Other industries sector.

TABLE 1

INPUT FORECAST WITH INFLATION BY INDUSTRY MODE

SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	'88-'93 AAGR %
DISCRETE MANUFACTURING	1695	1988	2587	3138	3790	4468	5417	6593	7950	20%
PROCESS MANUFACTURING	932	1054	1226	1347	1707	2279	2909	3715	4637	28%
TRANSPORTATION	137	149	180	220	270	335	419	526	652	24%
UTILITIES	67	305	357	418	480	552	630	718	826	15%
TELECOMMUNICATIONS	392	464	594	725	870	1018	1181	1359	1604	17%
DISTRIBUTION	536	594	714	891	1060	1219	1391	1588	1863	16%
BANKING AND FINANCE	1250	1417	1723	1991	2337	2802	3292	3868	4547	18%
INSURANCE	811	894	1054	1174	1331	1544	1858	2239	2603	17%
MEDICAL	220	252	314	376	460	561	690	848	1034	22%
EDUCATION	65	66	75	78	85	94	105	116	127	10%
SERVICES	140	155	184	207	240	283	378	505	618	24%
FEDERAL GOVERNMENT	2764	3204	3513	3993	4411	4921	5541	6251	7015	12%
STATE & LOCAL GVT.	1342	1498	1768	2123	2567	3132	3852	4778	5829	22%
OTHER INDUSTRY-SPECIFIC	220	252	321	378	456	533	642	769	916	19%
GRAND TOTAL	10571	12292	14610	17059	20064	23741	28305	33871	40221	19%

* NOTE: The 1993 figures were developed for this project. INPUT has not yet developed official 1993 figures.

TABLE 2

INPUT FORECAST WITHOUT INFLATION BY INDUSTRY MODE

SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	'88-'93 AAGR%
	1.0000	1.0200	1.0400	1.0400	1.0300	1.0300	1.0200	1.0200	1.0200	
INFLATION FACTORS	1.0000	1.020000	1.060800	1.103232	1.136329	1.170419	1.193827	1.217704	1.242058	
DISCRETE MFG.	1695	1949	2439	2844	3335	3817	4538	5414	6400	18%
PROCESS MFG.	932	1033	1156	1221	1502	1947	2437	3051	3733	25%
TRANSPORTATION	137	146	170	199	238	286	351	432	525	21%
UTILITIES	67	299	337	379	422	472	528	590	665	12%
TELECOMMUNICATIONS	392	455	560	657	766	870	989	1116	1291	14%
DISTRIBUTION	536	582	673	808	933	1042	1165	1304	1500	13%
BANKING AND FINANCE	1250	1389	1624	1805	2057	2394	2758	3176	3661	15%
INSURANCE	811	876	994	1064	1171	1319	1556	1839	2096	15%
MEDICAL	220	247	296	341	405	479	578	696	833	20%
EDUCATION	65	65	71	71	75	80	88	95	102	8%
SERVICES	140	152	173	188	211	242	317	415	498	22%
FEDERAL GOVERNMENT	2764	3141	3312	3619	3882	4204	4641	5133	5648	9%
STATE & LOCAL GVT.	1342	1469	1667	1924	2259	2676	3227	3924	4693	20%
OTHER INDUSTRY-SPEC.	220	247	303	343	401	455	538	632	737	17%
GRAND TOTAL	10571	12050	13775	15463	17657	20283	23711	27817	32382	16%

* NOTE: The 1993 figures were developed for this project. INPUT has not yet developed official 1993 figures.

TABLE 3

IBM FORECAST WITHOUT INFLATION BY INDUSTRY MODE

IBM SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	'88-'93 AAGR %
DISCRETE MANUFACTURING	1529	1756	2194	2555	2996	3427	4074	4860	5743	18%
PROCESS MANUFACTURING	852	956	1070	1132	1390	1796	2243	2803	3426	25%
UTILITIES	64	285	320	361	402	449	503	562	634	12%
FINANCE	1056	1174	1374	1527	1741	2025	2334	2690	3101	15%
SECURITIES	211	235	274	305	348	405	466	537	619	15%
DISTRIBUTION	864	951	1111	1296	1507	1720	2000	2333	2732	16%
INSURANCE	812	878	996	1066	1174	1322	1560	1843	2101	15%
STATE/LOCAL GVT.	1342	1469	1667	1924	2259	2676	3227	3924	4693	20%
HEALTH	225	253	303	348	414	489	590	710	849	19%
COMMUNICATIONS	337	391	482	565	658	748	851	960	1110	14%
TRANSPORTATION	118	126	147	173	205	247	302	372	451	21%
MEDIA	246	282	348	402	470	536	632	746	876	17%
CONSULTANTS	37	41	48	53	61	69	86	108	128	19%
COMPUTER SERVICES	20	22	25	27	30	35	45	59	71	21%
HIGHER EDUCATION	49	49	53	54	57	61	67	73	78	8%
SCHOOLS	18	18	20	20	22	24	27	29	32	9%
FEDERAL GOVERNMENT	2788	3167	3340	3653	3923	4254	4702	5208	5739	9%
GRAND TOTAL	10568	12063	13771	15461	17657	20283	23709	27817	32383	16%

* NOTE: The 1993 figures were developed for this project. INPUT has not yet developed official 1993 figures.

TABLE 4

IBM FORECAST WITH INFLATION BY INDUSTRY MODE

IBM SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	'88-'93 AAGR%
	1.0000	1.0259	1.0298	1.0366	1.0335	1.0339	1.034	1.037	1.0383	
INFLATION FACTOR	1.0000	1.0259	1.056472	1.0951387	1.1318258	1.1701947	1.209981	1.254751	1.302808	
DISCRETE MFG.	1529	1802	2318	2798	3391	4011	4930	6098	7482	22%
PROCESS MFG.	852	981	1130	1240	1574	2102	2714	3517	4464	29%
UTILITIES	64	292	338	395	455	525	608	705	825	16%
FINANCE	1056	1204	1451	1672	1970	2370	2824	3375	4040	19%
SECURITIES	211	241	290	334	393	473	564	674	806	19%
DISTRIBUTION	864	975	1174	1419	1706	2013	2420	2928	3559	20%
INSURANCE	812	901	1052	1168	1329	1547	1887	2312	2737	19%
STATE/LOCAL GVT.	1342	1507	1761	2107	2557	3131	3904	4923	6114	24%
HEALTH	225	259	320	382	468	573	714	891	1106	24%
COMMUNICATIONS	337	401	509	619	745	875	1029	1204	1447	19%
TRANSPORTATION	118	130	155	189	233	289	366	466	587	25%
MEDIA	246	289	367	440	532	627	765	936	1141	21%
CONSULTANTS	37	42	51	58	69	81	104	135	166	24%
COMPUTER SERVICES	20	23	27	30	34	41	55	74	92	25%
HIGHER EDUCATION	49	50	56	59	64	71	81	91	102	12%
SCHOOLS	18	18	21	22	25	28	32	37	42	13%
FEDERAL GOVERNMENT	2788	3249	3529	4001	4441	4978	5689	6535	7477	13%
GRAND TOTAL	10568	12359	14549	16933	19986	23735	28666	34901	42177	20%

* NOTE: The 1993 figures were developed for this project. INPUT has not yet developed official 1993 figures.

TABLE 5

IBM FORECAST WITH INFLATION BY MODE OF DELIVERY

IBM RECAST SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993* ($M)	'88-'93 AAGR%
FEDERAL GOVERNMENT PROFESSIONAL SERVICES										
SOFTWARE DEVELOPMENT	857	966	1077	1218	1289	1457	1698	1920	2171	12%
CONSULTING	308	357	373	395	437	456	496	523	563	7%
EDUCATION & TRAINING	252	272	299	333	369	401	425	469	517	9%
SYSTEMS INTEGRATION	796	910	988	1191	1409	1655	1967	2389	2869	19%
FACILITIES MANAGEMENT	575	744	792	864	936	1009	1103	1234	1357	9%
SUBTOTAL	2788	3249	3529	4001	4440	4978	5689	6535	7477	13%
COMMERICAL PROFESSIONAL SERVICES										
SOFTWARE DEVELOPMENT	4949	5504	6438	7292	8393	9630	11153	12975	14926	15%
CONSULTING	1416	1670	2075	2493	3071	3804	4791	6018	7446	24%
EDUCATION & TRAINING	851	1048	1299	1562	1924	2381	3000	3832	4757	25%
SYSTEMS INTEGRATION	408	717	1011	1366	1902	2650	3711	5142	7121	39%
PROJECT MANAGEMENT		70	99	135	188	262	367	505	700	39%
DESIGN & INTEGRATION		143	204	276	390	544	764	1065	1483	40%
OPERATIONS & MAINT.		21	30	42	59	85	124	166	235	41%
SI SOFTWARE DEV.		374	524	705	976	1357	1890	2624	3621	39%
SI CONSULTING		86	121	162	225	311	435	603	831	39%
EDUCATION & TRAINING		23	33	46	64	91	131	179	251	41%
FACILITIES MANAGEMENT	160	175	198	220	254	293	341	401	461	16%
SUBTOTAL	7784	9114	11021	12933	15544	18758	22996	28368	34711	22%
GRAND TOTAL PROFESSIONAL SERVICES										
SOFTWARE DEVELOPMENT	5806	6470	7515	8510	9682	11087	12851	14895	17097	15%
CONSULTING	1724	2027	2448	2888	3508	4260	5287	6541	8009	23%
EDUCATION & TRAINING	1103	1320	1598	1895	2293	2782	3425	4301	5274	23%
SYSTEMS INTEGRATION	1204	1627	1999	2557	3311	4305	5678	7531	9988	31%
FACILITIES MANAGEMENT	735	919	990	1084	1190	1302	1444	1635	1818	11%
GRAND TOTAL	10572	12363	14550	16934	19984	23736	28685	34903	42186	20%

* NOTE: The 1993 figures were developed for this project. INPUT has not yet developed official 1993 figures.

TABLE 6

IBM FORECAST WITH INFLATION BY INDUSTRY AND MODE OF DELIVERY

IBM SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	88-93 AAGR%
DISCRETE MANUFACTURING										
SOFTWARE DEVELOPMENT	972	1088	1354	1578	1831	2059	2391	2789	3217	15%
CONSULTING	278	330	436	539	670	813	1027	1294	1605	24%
EDUCATION & TRAINING	167	207	273	338	420	509	643	824	1025	25%
SYSTEMS INTEGRATION	80	142	213	295	415	566	796	1105	1534	39%
FACILITIES MANAGEMENT	31	34	42	48	55	63	73	86	99	16%
SUBTOTAL	1528	1801	2318	2798	3391	4010	4930	6098	7480	22%
PROCESS MANUFACTURING										
SOFTWARE DEVELOPMENT	542	592	660	699	850	1079	1316	1609	1920	22%
CONSULTING	155	180	213	239	311	426	565	746	958	32%
EDUCATION & TRAINING	93	113	133	150	195	267	354	475	612	33%
SYSTEMS INTEGRATION	45	77	104	131	193	297	438	638	915	48%
FACILITIES MANAGEMENT	17	19	20	21	26	33	40	50	59	23%
SUBTOTAL	852	981	1130	1240	1575	2102	2713	3518	4464	29%
UTILITIES										
SOFTWARE DEVELOPMENT	41	176	198	223	246	270	295	322	355	10%
CONSULTING	12	54	64	76	90	107	127	150	177	18%
EDUCATION & TRAINING	7	34	40	48	56	67	79	95	113	19%
SYSTEMS INTEGRATION	3	23	31	42	56	74	98	128	169	32%
FACILITIES MANAGEMENT	1	6	6	7	7	8	9	10	11	10%
SUBTOTAL	64	293	339	396	455	526	608	705	825	16%
FINANCE										
SOFTWARE DEVELOPMENT	672	727	848	943	1064	1217	1370	1544	1737	13%
CONSULTING	192	221	273	322	389	481	588	716	867	22%
EDUCATION & TRAINING	116	138	171	202	244	301	368	456	554	22%
SYSTEMS INTEGRATION	55	95	133	176	241	335	456	612	828	36%
FACILITIES MANAGEMENT	22	23	26	28	32	37	42	48	54	14%
SUBTOTAL	1057	1204	1451	1672	1970	2370	2824	3375	4040	19%
SECURITIES										
SOFTWARE DEVELOPMENT	134	145	169	188	212	243	273	308	347	13%
CONSULTING	38	44	55	64	78	96	117	143	173	22%
EDUCATION & TRAINING	23	28	34	40	49	60	74	91	110	22%

IBM SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	88-93 AAGR%
SYSTEMS INTEGRATION	11	19	27	35	48	67	91	122	165	36%
FACILITIES MANAGEMENT	4	5	5	6	6	7	8	10	11	14%
SUBTOTAL	210	241	290	333	393	473	563	674	806	19%
DISTRIBUTION										
SOFTWARE DEVELOPMENT	550	589	686	800	921	1033	1174	1339	1531	14%
CONSULTING	157	179	221	274	337	408	504	621	764	23%
EDUCATION & TRAINING	95	112	138	171	211	256	316	395	488	23%
SYSTEMS INTEGRATION	45	77	108	150	209	284	391	531	730	37%
FACILITIES MANAGEMENT	18	19	21	24	28	31	36	41	47	14%
SUBTOTAL	865	976	1174	1419	1706	2012	2421	2927	3559	20%
INSURANCE										
SOFTWARE DEVELOPMENT	517	544	614	659	717	794	915	1058	1177	12%
CONSULTING	148	165	198	225	263	314	393	491	587	21%
EDUCATION & TRAINING	89	104	124	141	164	196	246	312	375	22%
SYSTEMS INTEGRATION	43	71	96	123	163	219	305	419	561	35%
FACILITIES MANAGEMENT	17	17	19	20	22	24	28	33	36	13%
SUBTOTAL	814	901	1051	1168	1329	1547	1887	2313	2736	19%
STATE/LOCAL GOVERNMENT										
SOFTWARE DEVELOPMENT	853	910	1029	1188	1381	1608	1893	2252	2629	17%
CONSULTING	244	276	331	406	505	635	813	1044	1312	26%
EDUCATION & TRAINING	147	173	208	255	316	397	509	665	838	27%
SYSTEMS INTEGRATION	70	119	162	222	313	442	630	892	1254	41%
FACILITIES MANAGEMENT	28	29	32	36	42	49	58	70	81	18%
SUBTOTAL	1342	1507	1762	2107	2557	3131	3903	4923	6114	24%
HEALTH										
SOFTWARE DEVELOPMENT	143	157	187	215	253	294	346	408	476	17%
CONSULTING	41	48	60	74	93	116	149	189	237	26%
EDUCATION & TRAINING	25	30	38	46	58	73	93	120	152	27%
SYSTEMS INTEGRATION	12	20	29	40	57	81	115	162	227	41%
FACILITIES MANAGEMENT	5	5	6	6	8	9	11	13	15	18%
SUBTOTAL	226	260	320	381	469	573	714	891	1107	24%
COMMUNICATIONS										
SOFTWARE DEVELOPMENT	214	242	297	349	402	449	499	551	622	12%
CONSULTING	61	74	96	119	147	178	214	255	310	21%
EDUCATION & TRAINING	37	46	60	75	92	111	134	163	198	22%

IBM SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	88-93 AAGR%
SYSTEMS INTEGRATION	18	32	47	65	91	124	166	218	297	35%
FACILITIES MANAGEMENT	7	8	9	11	12	14	15	17	19	13%
SUBTOTAL	337	402	509	619	744	876	1028	1204	1446	19%
TRANSPORTATION										
SOFTWARE DEVELOPMENT	75	78	91	107	126	148	177	213	252	19%
CONSULTING	22	24	29	36	46	59	76	99	126	28%
EDUCATION & TRAINING	13	15	18	23	29	37	48	63	80	29%
SYSTEMS INTEGRATION	6	10	14	20	28	41	59	84	120	43%
FACILITIES MANAGEMENT	2	2	3	3	4	5	5	7	8	19%
SUBTOTAL	118	129	155	189	233	290	365	466	586	25%
MEDIA										
SOFTWARE DEVELOPMENT	157	174	215	248	287	322	371	428	491	15%
CONSULTING	45	53	69	85	105	127	159	199	245	24%
EDUCATION & TRAINING	27	33	43	53	66	80	100	126	156	24%
SYSTEMS INTEGRATION	13	23	34	46	65	89	123	170	234	38%
FACILITIES MANAGEMENT	5	6	7	7	9	10	11	13	15	15%
SUBTOTAL	247	289	368	439	532	628	764	936	1141	21%
CONSULTANTS										
SOFTWARE DEVELOPMENT	23	25	30	33	37	41	51	62	72	17%
CONSULTING	7	8	10	11	14	16	22	29	36	26%
EDUCATION & TRAINING	4	5	6	7	8	10	14	18	23	27%
SYSTEMS INTEGRATION	2	3	5	6	8	11	17	24	34	41%
FACILITIES MANAGEMENT	1	1	1	1	1	1	2	2	2	18%
SUBTOTAL	37	42	52	58	68	79	106	135	167	24%
COMPUTER SERVICES										
SOFTWARE DEVELOPMENT	13	14	16	17	19	21	27	34	40	19%
CONSULTING	4	4	5	6	7	8	11	16	20	28%
EDUCATION & TRAINING	2	3	3	4	4	5	7	10	13	29%
SYSTEMS INTEGRATION	1	2	2	3	4	6	9	13	19	43%
FACILITIES MANAGEMENT	0.	0.	0.	1	1	1	1	1	1	19%
SUBTOTAL	20	23	26	31	35	41	55	74	93	25%
HIGHER EDUCATION										
SOFTWARE DEVELOPMENT	31	30	33	33	35	37	39	42	44	6%
CONSULTING	9	9	11	11	13	14	17	19	22	14%
EDUCATION & TRAINING	5	6	7	7	8	9	11	12	14	14%

IBM SEGMENTATION	1985 ($M)	1986 ($M)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	1993 * ($M)	88-93 AAGR%
SYSTEMS INTEGRATION	3	4	5	6	8	10	13	17	21	27%
FACILITIES MANAGEMENT	1	1	1	1	1	1	1	1	1	6%
SUBTOTAL	49	50	57	58	65	71	81	91	102	12%
SCHOOLS										
SOFTWARE DEVELOPMENT	11	11	12	13	13	14	16	17	18	7%
CONSULTING	3	3	4	4	5	6	7	8	9	16%
EDUCATION & TRAINING	2	2	2	3	3	4	4	5	6	16%
SYSTEMS INTEGRATION	1	1	2	2	3	4	5	7	9	29%
FACILITIES MANAGEMENT	0.	0.	0.	0.	0.	0.	0.	1	1	8%
SUBTOTAL	17	17	20	22	24	28	32	38	43	13%
FEDERAL GOVERNMENT										
SOFTWARE DEVELOPMENT	857	966	1077	1218	1289	1457	1698	1920	2171	12%
CONSULTING	308	357	373	395	437	456	496	523	563	7%
EDUCATION & TRAINING	252	272	299	333	369	401	425	469	517	9%
SYSTEMS INTEGRATION	796	910	988	1191	1409	1655	1967	2389	2869	19%
FACILITIES MANAGEMENT	575	744	792	864	936	1009	1103	1234	1357	9%
SUBTOTAL	2788	3249	3529	4001	4440	4978	5689	6535	7477	13%
GRAND TOTAL PROFESSIONAL SERVICES										
SOFTWARE DEVELOPMENT	5805	6468	7516	8511	9682	11086	12851	14894	17099	15%
CONSULTING	1724	2029	2447	2887	3507	4260	5285	6542	8011	23%
EDUCATION & TRAINING	1104	1322	1598	1896	2292	2783	3425	4259	5274	23%
SYSTEMS INTEGRATION	1205	1628	1999	2554	3311	4305	5679	7531	9986	31%
FACILITIES MANAGEMENT	734	919	989	1084	1190	1302	1443	1637	1817	11%
GRAND TOTAL	10572	12363	14549	16932	19982	23735	28683	34863	42187	20%

* NOTE: The 1993 figures were developed for this project. INPUT has not yet developed official 1993 figures.

TABLE 7

INDUSTRY SECTOR CROSSWALK

IBM SECTORS

INPUT SECTORS	Mfg.	Proc.	Util.	Fin.	Sec.	Dist.	Ins.	State Loc. Gov.	Health	Com.	Trans.	Media	Cons	Comp. Svc.	High Ed.	Schls	Fed. Gov.
	M	P	U	F	S	D	N	G	H	A	T	K	C	B	E	R	Y
DISCRETE MANUFACTURING	X					X						X					
PROCESS MANUFACTURING		X				X											
TRANSPORTATION											X						X
UTILITIES		X	X														
TELECOMMUNICATIONS										X		X					
DISTRIBUTION	X	X				X											
BANKING & FINANCE				X	X												
INSURANCE							X										
MEDICAL									X								
EDUCATION									X					X	X	X	
SERVICES	X		X	X		X	X		X		X	X	X	X			
FEDERAL GOVERNMENT																	X
STATE/LOCAL GOVERNMENT								X									
OTHER INDUSTRIES	X			X		X	X		X		X	X	X		X	X	

B

Appendix: Exhibits

B

Appendix: Exhibits

There are also four exhibits to this report that are pertinent to an overall understanding of the results of this project. They are:

Exhibit A	INPUT defined industry sectors - a list of sectors, as used by INPUT.
Exhibit B	Relevant INPUT definitions.
Exhibit C	IBM-defined industry sectors - a list of sectors as defined by IBM.
Exhibit D	List of large contracts By Industry - examples of major, recent professional services contracts that are known to INPUT.

EXHIBIT A

INPUT'S
INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Discrete Manufacturing	23	Apparel
	25	Furniture
	27	Printing
	31	Leather
	34	Metal
	35	Machinery
	36	Electronics
	37	Transportation
	38	Scientific and Control Instruments
	39	Miscellaneous Manufacturing
Process Manufacturing	10	Metal Mining
	11	Anthracite Mining
	12	Coal Mining
	13	Oil and Gas Extraction
	14	Mining/Quarrying of Non-Metallic Minerals, except Fuels
	20	Food Products
	21	Tobacco
	22	Textile Products
	24	Lumber and Wood Products
	26	Paper Products
	28	Chemicals
	29	Petroleum
	30	Rubber and Plastics
	32	Stone, Glass, Clay
	33	Primary Metals

EXHIBIT A (Cont'd.)

INPUT'S
INDUSTRY SECTOR DEFINITIONS
(Con't)

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Transportation	40	Railroads
	41	Local Transit
	42	Motor Freight
	43	U.S. Postal Service
	44	Water Transportation
	45	Air
	46	Pipelines
	47	Transportation Services
Utilities	49	Electric, Gas, and Sanitary
Telecommunications	48	Communications
Wholesale Distribution	50	Durable Goods
	51	Nondurable Goods
Retail Distribution	52	Building Materials, Hardware
	53	General Merchandise
	54	Food
	55	Automotive and Gas Stations
	56	Apparel
	57	Furniture
	58	Eating and Drinking
	59	Miscellaneous Retail

EXHIBIT A (Cont'd.)

INPUT'S
INDUSTRY SECTOR DEFINITIONS
(Con't)

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Banking and Finance	60	Banks
	61	Credit Agencies
	62	Security and Commodity Brokers
	67	Holding and Investment Offices
Insurance	63	Insurance (Life, Health, Etc.)
	64	Insurance Agents
Medical	80	Health Services
Education	82	Educational Services
Services	73	Business Services (excluding information services companies themselves)
	89	Miscellaneous Services
Federal Government	N/A	As Appropriate
State and Local Government	N/A	As Appropriate

EXHIBIT A (Cont'd.)

INPUT'S
INDUSTRY SECTOR DEFINITIONS
(Con't)

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Other Industries	01-09	Agriculture, Forestry, and Fishing
	15-17	Construction
	65	Real Estate
	66	Combinations of Real Estate, Insurance, Loans, Law Offices
	70	Hotels, Rooming Houses, Camps, and Other Lodging Places
	72	Personal Services
	75	Automotive Repair, Services, and Garages
	76	Miscellaneous Repair Services
	78	Motion Pictures
	79	Amusement and Recreation Services, except Motion Pictures
	81	Legal Services
	83	Social Services
	84	Museums, Art Galleries, Botanical and Zoological Gardens
	86	Membership Organizations

EXHIBIT B

DEFINITIONS

The following definitions are applicable within the context of this report:

A

Information Services

Computer-related services involving one or more of the following:

- Processing of computer-based applications using vendor computers (called "processing services").
- Services that assist users in performing functions on their own computers or vendor computers (called "software products" and/or "professional services").
- Services that utilize a combination of hardware and software, integrated into a total system (called "turnkey systems").

B

User Expenditures

All user expenditures contained in this report are "available" (i.e., noncaptive, as defined below).

Noncaptive Information Services User Expenditures - Expenditures paid for information services provided by a vendor that is not part of the same parent corporation as the user.

C

Professional Services

This category is made up of delivery modes in the following categories:

Software Development - This service develops a software system on a custom basis. It includes one or more of the following: user requirements, system design, and contract programming.

Education and Training Services - These services help people acquire new skills, techniques, or knowledge related to computers. This definition does not include services to educational institutions. (This latter market is included in the education industry segment.)

Consulting Services - Consultants advise clients on computer-related issues that are usually management oriented. Feasibility studies and computer audits are examples of services provided.

EXHIBIT B (Cont'd.)

Professional Services Facilities Management (PSFM) - This is a counterpart to **processing** facilities management, except that in this case the **computers are owned by the client**, not the vendor; the vendor provides human resources to operate and manage the client facility.

Systems Integration - Services associated with systems design, integration of computing components, installation, and acceptance of computer/communication systems. Systems integration can include one or more of the major information services delivery modes - professional services, turnkey systems, and software products. System components may be furnished by separate vendors (not as an integrated system by one vendor, called the prime contractor); services may be furnished by a vendor or by a not-for-profit organization. Integration services may be provided with related engineering activities, such as SE&I (Systems Engineering and Integration) or SETA (Systems Engineering and Technical Assistance).

EXHIBIT C

IBM DEFINED INDUSTRY SECTORS

Industrial Sector

1.	M	Manufacturing
2.	P	Process
3.	U	Utilities

Service Sector

4.	F	Finance
5.	S	Securities
6.	D	Distribution
7.	N	Insurance

General and Public Sector

8.	G	State & Local Government
9.	H	Health
10.	A	Communications
11.	T	Transportation
12.	K	Media
13.	C	Consultants
14.	B	Computer Services
15.	E	Higher Education

Education

16.	R	Schools

Federal Government

17.	Y	Federal

EXHIBIT D

SAMPLE LIST
LARGE PROFESSIONAL SERVICE CONTRACTS

PROJECT	INDUSTRY	CUSTOMER	VENDOR	VALUE ($ M)
Billing	Communications	Ameritec/ATI	EDS	10
Hazardous Waste	Communications	General Telephone	IBM	
Office Automation	Communications	AT&T	CSC	10
Standardize Regional Systems	Communications	Bell South		9-10
Accounting	Distribution	May Dept		
Accounting	Distribution	Rapid America	Whiteside	
Billing	Distribution	Leaseway		2
ISDN	Distribution	McDonalds Corp.	Ill. Bell	
Merchandising Information System	Distribution	Norse Shoe	CSC	3
Network	Distribution	Agway Stores	IBM	14
POS System	Distribution	Best Stores	EDS/AT&T	280
Store Network (POS)	Distribution	KMart	EDS	20
Back Office Processing	Fed Gov.	VISA Int.		20
Switching Network	Fed Gov.	Fed. Reserve - Chicago	Telenet	2
Brokerage Automation	Finance	Citicorp	EDS	15
IBM-based Securities System	Finance	Major N.Y. Financial Institution	Booz-Allen	
ISDN	Finance	Bank of Oregon	PACTEL	
Network Switching	Finance	Bank America	AT&T	
V/D PBX	Finance	MHT		
HospitalTerminals	Health	Humana Inc, Louisville, KY	Health Data Scl	11
LAN	Health	N.Y. Hospital		
Patient Care Information System	Health	American Medical		50
Unknown	Higher Educ.	Thomas Jefferson U.	Bell Pa.	
V/D Network	Higher Educ.	W. Michigan U.	UCS	9
V/D Network	Higher Educ.	USC	AT&T	22
Claims Processing	Insurance.	Commercial Union		7
Commercial Insurance Agent Automation	Insurance	Nationwide Insurance		30
Communications Network	Insurance	Liberty Mutual		8
Product DBMS	Insurance	CNA		10
Rating/Policy Reinsurance	Insurance	Employee Ins.		8-10
Remote Product Development	Insurance	Equitable Life	IBM	5

EXHIBIT D (Cont'd.)

SAMPLE LIST
LARGE PROFESSIONAL SERVICE CONTRACTS
(Con't)

PROJECT	INDUSTRY	CUSTOMER	VENDOR	VALUE ($ M)
CIM	Manufacturing	RCA		5
Coroprate Reporting Network	Manufacturing	Allied - Signal	IBM	6
Integrate Plant Information	Manufacturing	General Electric		40
Just-In-Time	Manufacturing	Allied Signal		
Manufacturing System	Manufacturing	Motorola	Comshare	
Medical Diagonostics	Manufacturing	General Electric	IBM	10
Office Automation	Manufacturing	Ford Motors	IBM	200
Several Systems (Payroll, GL. Claims)	Manufacturing	Kaiser Foundation		30-50
MRP	Process Mftg.	Sterling Drug		10
MRP II, CIM	Process Mftg.	Schering Plough		6
Product Optimization	Process Mftg.	Union Carbide		
Product Optimization	Process Mftg.	Union Carbide		
Billing	Proprietary	Proprietary	Arthur Andersen	30
CIM	Proprietary	Proprietary	Arthur Andersen	52
CIM	Proprietary	Proprietary	Arthur Andersen	11
CIM	Proprietary	Proprietary	Arthur Andersen	10
CIM	Proprietary	Proprietary	Arthur Andersen	9
IBM/DEC Hardware Integration	Proprietary	Proprietary	Arthur Andersen	78
Information Management	Proprietary	Proprietary	Arthur Andersen	8
Inventory	Proprietary	Proprietary	Arthur Andersen	10
Loan Processing	Proprietary	Proprietary	Arthur Andersen	12
MACPAC/XF	Proprietary	Proprietary	Arthur Andersen	12
Sales Management	Proprietary	Proprietary	Arthur Andersen	17
Bond Buyer Network	Securities	NYSE	Arthur Andersen	5
Catalog Tracking	State/Local Gov.	Columbus (OH) Libary	Systemhouse	1
Claims Processing	State/Local Gov.	NY, State of	CSC	133
Criminal Justice System	State/Local Gov.	Los Angeles, City of	Systemhouse	
ETN Telephone System	State/Local Gov.	WY, State of	C&P	4
Eligibility System	State/Local Gov.	DC Human Services	Systemhouse	2
Network	State/Local Gov.	NJ, State of	CSC	12
Network Consolidaton	State/Local Gov.	PA, State of	Boeing	
Registration	State/Local Gov.	NJ, State of	Price-Waterhous	13
Supercomputer Network	State/Local Gov.	AL, State of	BCS	39
Voice/Data Integration	State/Local Gov.	WI, State of	AT&T	200
Voice/Data Network	State/Local Gov.	PA, State of	BCS	20
Administrative Education System	State/Local Gov.	NC, State of	IBM	2

EXHIBIT D (Cont'd.)

SAMPLE LIST
LARGE PROFESSIONAL SERVICE CONTRACTS
(Con't)

PROJECT	INDUSTRY	CUSTOMER	VENDOR	VALUE ($ M)
Fiber Optic System	TELE	United Telephone		2,500
Data Integration	Transportation	SeaLand		12
Field Location Replacement	Transportation	Ryder (Miami)		10
Office Automation	Transportation	Aircraft Owners Assoc	Systemhouse	2
Order Processing	Transportation	Amer President Lines	ESD	
Personnel System	Transportation	Ill. Central RR		6
Reservation System (Expansion)	Transportation	Eastern Airlines		5
Reservations System	Transportation	American Airlines	IBM	6
CAD/CAM	Utilities	Delmarva P&L		5
Customer Information System	Utilities	Kentucky Utilities		5
Customer Service Information	Utilities	G&E		100
Energy Management	Utilities	Omaha Power	CDC	5
Energy Management	Utilities	Omaha Public Power	CDC	5
Energy Management	Utilities	GPU (PA)	CDC	8
Energy Management	Utilities	PG&E	CDC	20
Energy Management	Utilities	Metropolitan Edison	CDC	5
Load Monitor	Utilities	Portland Gas	TRW	
Materials Management	Utilities	Detroit Edison	EDS	
Meter Reading	Utilities	Allegheny Power	IBM	78
Records Management	Utilities	State of NY E&G	EDS	
Telephone Billing	Utilities	CONTEL	EDS	5