Market Analysis
Program (MAP)

Industry Sector and Cross-Industry Markets 1988-1993

Executive Overview

INPUT®

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INDUSTRY SECTOR AND CROSS-INDUSTRY MARKETS 1988-1993

EXECUTIVE OVERVIEW

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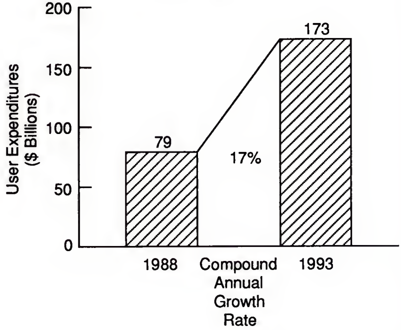
I

Market Overview

In 1987, overall United States information services user expenditures totaled $67 billion. The growth rate during 1988 is anticipated to be 18%, with expenditures reaching $79 billion. For the five-year forecast period, INPUT projects a 17% compound annual growth rate (CAGR), resulting in a $173 billion market in 1993. Exhibit I-1 shows INPUT's projection. This 17% CAGR is identical to the rate projected in INPUT's 1987 report.

EXHIBIT I-1

INFORMATION SERVICES INDUSTRY
1988-1993

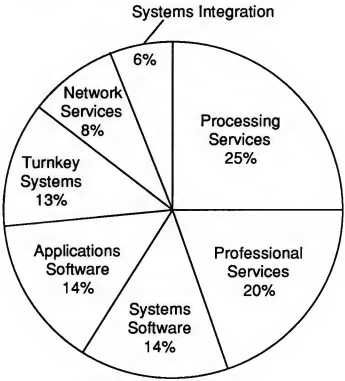


For perspective, note that this 17% rate is several times larger than the U.S. Gross National Product (GNP) growth rate, discussed in the Introduction Section of this report.

Exhibit I-2 shows the distribution of 1987 expenditures by delivery mode. Processing services make up the largest mode, but combined applications and systems software modes are even larger, providing 28% of the industry total.

EXHIBIT I-2

INFORMATION SERVICES INDUSTRY EXPENDITURES BY DELIVERY MODE 1987



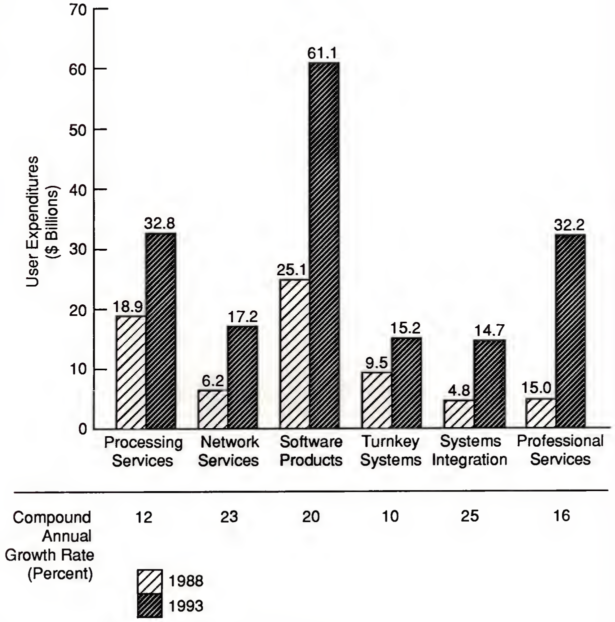
Total Size: $67 Billion

The size and growth rates of the six "delivery modes" tracked by INPUT are shown in Exhibit I-3. Systems and applications software are combined here. Obviously, software represents the largest opportunity, but rapid growth rates in network services and systems integration are also noteworthy.

On balance, the information services industry remains healthy and vibrant. Even the sectors with the lowest growth rates (10-12%) offer significant growth opportunities.

EXHIBIT I-3

INFORMATION SERVICES INDUSTRY DELIVERY MODES
1988-1993



II

Information Services Environment

A
Driving Forces

The primary forces behind the healthy growth of the information services market are summarized in Exhibit II-1.

EXHIBIT II-1

DRIVING FORCES IN INFORMATION SERVICES 1988-1993

- Introduction of New Computer Systems
- Products and Services Markets Blurring
- Networking Requirements
- Internationalization
- Standards
- New Technologies
    - Image Processing
    - Integrated Voice/Data System
    - Client/Server Architecture
- Systems Complexity

The introduction of new and more-powerful computer systems continues to act as a direct stimulus on software markets. Both applications and systems software products are driven by the continuing emergence of new and more-powerful systems of all sizes. It has been estimated that a dollar spent on microcomputer equipment results in three dollars spend on software.

Traditional products and services markets are blurring and overlapping. Product-oriented vendors (software products, turnkey systems) are moving into services (consulting, custom software development, systems integration) and vice versa. These shifts generally began as defensive strategies to protect an installed base and recurring revenues from that base. More frequently, vendors are consciously expanding their products/services mix as an offensive strategy to enter new markets in an era of intense competition.

The demand for increasing local-area and wide-area networking is also fueling information services industry growth in communication software products, network management services, and systems integration projects to deal with this increasingly complex environment.

Strong growth in European software and services markets, plus high potential in the Pacific Rim, are causing many vendors to evaluate these markets and to "internationalize" their offerings. Simultaneously, European vendors have targeted the large U.S. market, and Japanese companies are studying the U.S. closely. Japanese entry can be anticipated in the 1990s, initially through acquisition or joint ventures.

Standards driven by dominant vendors or by consortia are emerging in a number of areas—such as UNIX, IBM's SAA, user graphical interfaces, SQL, open systems interconnection, token ring networks, etc. To maintain or enhance market position, vendors are actively incorporating these standards into their own offerings.

As always, new technologies are a strong driver of information services. Image processing, integrated voice/data systems, high-performance digital communication systems, distributed processing, and client/server system architectures will create the need—in fact, the requirement—for services and support from the information services sector.

Finally, systems and solutions are becoming increasingly complex to match growing user sophistication. This leads to additional professional services and systems integration contacts, and requires correspondingly more complex software products and network services.

B

Industry Consolidation

During the 1990s, INPUT projects that consolidation will continue. Large vendors will often grow at a rate equal to or faster than the overall market and will provide a broader range of offerings. The smaller vendors will, by and large, be content with vertical market (or niche) offerings or subcontract roles, as shown in Exhibit II-2. At all levels, the focus will be on the provision of complete solutions, not just single products.

EXHIBIT II-2

CONSOLIDATION IN THE INDUSTRY A DOMINANT PHENOMENON IN THE 1990S

- A Smaller Number of Larger Vendors
- Large Vendors Providing a Broader Range of Integrated Offerings
- Large Vendors Supported by Smaller Niche Vendors
- All Levels Targeted at Providing Solutions

Exhibit II-3 lists the largest information services vendors, based on estimated 1988 U.S. revenues. IBM continues to occupy a dominant role. Digital Equipment and Unisys are also highly ranked. Systems software is the primary contributor to all three vendors' information services revenues. For more detail on these and other leading and emerging vendors, see INPUT's Vendor Analysis Program (VAP).

EXHIBIT II-3

LEADING INFORMATION SERVICES VENDORS, 1988

Vendor	1988 U.S. Revenues* ($ Billions)	Market Share (Percent)
IBM	5.7	7
EDS	1.7	2
ADP	1.6	2
Digital Equipment	1.3	2
Unisys	1.2	1
Computer Sciences	1.1	1
Anderson Consulting	1.0	1
Control Data	0.9	1
McDonnell Douglas	0.9	1
Computer Associates	0.7	1
TRW	0.7	1
Intergraph	0.7	1
Equifax	0.7	1
Total		22

*INPUT Estimates.

Vendor population within delivery mode is shown in Exhibit II-4. INPUT categorizes firms based on their primary source of information services revenues. In this categorization, firms with annual revenues below $250,000 are not counted. There are approximately 12,000 such smaller firms operating in the U.S.

EXHIBIT II-4

POPULATION OF INFORMATION SERVICES VENDORS, 1988

Type of Company	Number of Companies*
Processing Services	2,000
Network Services	300
Systems Software Products	1,200
Applications Software Products	1,800
Turnkey Systems	1,300
Systems Integration	300 *
Professional Services	1,300
Total	8,200

*Several companies that formerly identified themselves as professional services companies now prefer a systems integration designation. However, many of these are actually systems integration subcontractors. The number of prime contractors is considerably less than the number of companies identifed as systems integration companies in this survey.

C

Leading Industry/ Cross-Industry Sectors

The leading vertical market sectors are displayed in Exhibit II-5. Banking and finance, which historically has been a strong user of processing services, remains the largest sector, and is still growing at an impressive 17%.

Discrete manufacturing is primarily fueled by rapid growth in design and manufacturing workstations, plus shop floor control applications. The concept of computer-integrated manufacturing (CIM) is motivating many large- and medium-sized manufacturers to invest in automation products and services.

Federal growth is subject to budget constraints, Graham-Rudman limitations, and new postelection policies. INPUT expects higher growth in federal civilian sector expenditures than in defense-related spending, due

to concerns about defense procurement practices and very expensive contracts already in process.

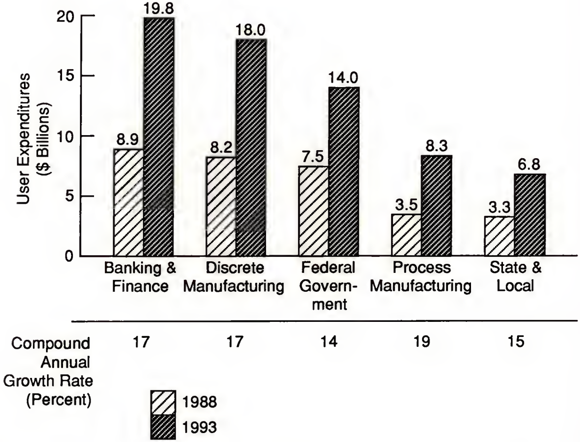
Process manufacturing emerges as one of the larger industry sectors, with increased use of programmable controllers for factory/automation and considerable CIM emphasis.

State and local government, a market that has lagged the private sector, has accelerated spending in a "catch-up" mode. Large state government systems integration projects have boosted market growth rates for the sector.

Complete details for all industry sectors may be found in the specific sector reports, and in the data base in the appendix of these binders.

EXHIBIT II-5

LEADING INFORMATION SERVICES INDUSTRY VERTICAL MARKETS
1988-1993



III

Delivery Mode Forecasts and Analyses

A

Processing Services

The processing services market, which has often been declared dead, continues to surprise its critics and grow at 12% CAGR. Although it is true that market entry is not easy, established vendors have maintained steady revenue and profit growth.

Driving forces that continue to positively influence growth in the total processing services market are shown in Exhibit III-1 and include the following:

EXHIBIT III-1

DRIVING FORCES—
PROCESSING SERVICES MARKETS

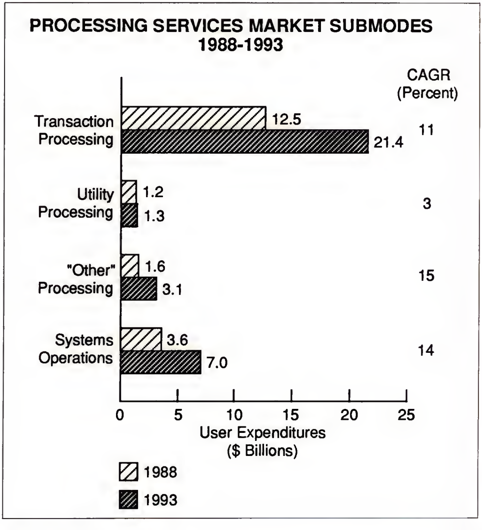
- Current User Inertia to Change
- Outsourcing Trends
- Industry-Oriented Solutions
- Time-Critical Solutions
- Disaster Recovery
- Innovations by Vendors
- Systems Integration Stimulates Systems Operations Contracts

- Current User Interia to Change: This reflects the fact that it is often easier to continue using a processing service than to develop an alternative in-house computer installation.

- Outsourcing Trends: To control costs or to obtain expertise not available in-house, users in the past few years have tended to buy outside services, particularly in industries such as banking and other financial services.
- Disaster Recovery: With the installation of mission-critical systems in many corporate data processing installations, there is increasing interest in disaster recover capability. The fire at the First Interstate Bank computer center in Los Angeles most recently drew attention to this issue. Companies such as Comdisco and Sungard are offering this service, and many IS managers are viewing it as a necessity.
- The completion of complex systems integration projects will create additional demand for systems operations. As mission-critical systems are ready for operation, many customers will conclude that the best method of running these systems is to turn them over to the vendors who created them.

Growth rates for submodes of processing services vary widely, as shown in Exhibit III-2.

EXHIBIT III-2



Obviously, transaction processing is the largest segment of the market. But opportunities are available in systems operations (facilities management) and other processing services such as disaster recovery. As long as vendors can provide innovative services and rapid delivery, the processing services market will grow at a moderate rate from its large current base.

B

Network Services

The network services market will grow at a strong 23% during the forecast period, spurred by on-line data bases and EDI.

Driving forces that will positively impact growth in network/electronic information services, as shown in Exhibit III-3, include the following.

EXHIBIT III-3

DRIVING FORCES— NETWORK SERVICES MARKET

- PC Population
- Consumer Information Services
- ISDN
- EDI Popularity
- Wide-Area Networking
- Business Need for Rapidly Available Electronic Information
- RBOC Entry
- Network Management Services
- Voice Information Services
- Global Network Infrastructure

- PC Population: The large installed base of several million standalone PCs will increasingly need to be interconnected, which will drive the market for LAN-based network services.

- Consumer Information Services: The consumer environment represents a largely untouched market for companies now providing on-line data bases to corporate clients.

- ISDN: The integration of voice and data in public networks will create new market opportunities for vendors of telecommunications applications.

- EDI Popularity: The Electronic Data Interchange market is expected to show rapid growth over the next several years as companies move to automated interfaces with vendors and customers to enhance management control, reduce paper costs, and shorten lead times.

- Wide-Area Networking: The market for wide-area networking is being enhanced by the increasing adoption of the X.25 standard, and products are being introduced for inter-connection of local-area networks.

- Business Need for Rapidly Available Electronic Information: This information is frequently available by convenient access to on-line data bases.

- Regional Bell Operating Companies (RBOCs) Entry: The expected entry of RBOCs into the network services market will expand the products and supporting services available to potential users.

- Voice Information Services: The technology is increasingly becoming available for text-to-voice conversion and for sophisticated voice response systems that could substantially increase the efficiency of current communications services.

Specific growth rates for the various submodes of network services are shown in Exhibits III-4 and III-5. Only electronic mail services, which are being displaced by in-house E-Mail and voice mail services, have a growth rate below the industry average.

EXHIBIT III-4

ELECTRONIC INFORMATION SERVICES SUBMODES, 1988-1993

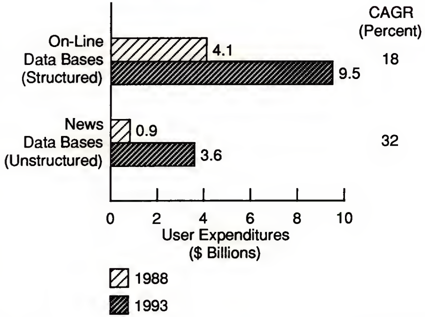
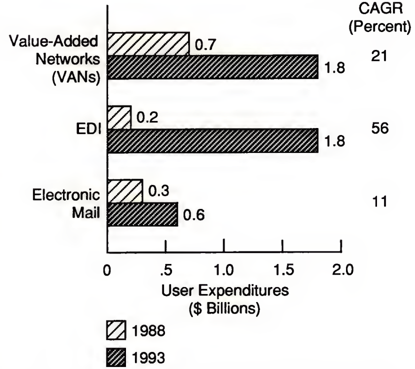


EXHIBIT III-5

NETWORK APPLICATIONS SUBMODES 1988-1993

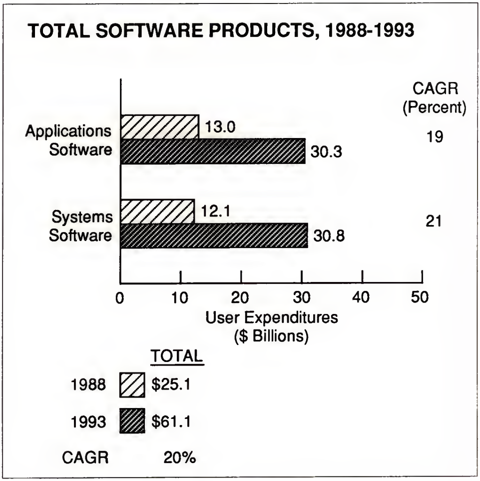


C

Software Products

The largest information services sector, by far, is the combination of applications and systems software. The split between these two software submodes is relatively even, as shown in Exhibit III-6. Systems software growth is slightly higher due to the requirement for increasingly complex control communications and development products and tools for more powerful and widely distributed systems.

EXHIBIT III-6



TOTAL SOFTWARE PRODUCTS, 1988-1993

Driving forces that continue to positively impact growth in the applications software products market are shown in Exhibit III-7.

EXHIBIT III-7

DRIVING FORCES APPLICATIONS SOFTWARE PRODUCTS MARKET

- CPU Population Growth
- Standards
- Workstation Power
- Industry-Specific Thrusts
- EIS/ Other Emerging Niches
- Application Complexity

- CPU Population Growth: The large installed base of personal computers, in particular, will create the need for additional applications. In the corporate market, most personal computers are being utilized for only one or two applications. The number of applications per system needs to be increased to improve the efficiency of personal computers.

- Standards: As standards such as UNIX, SAA, and SQL are adopted, it will become easier to write software for a larger number of platforms. In addition, new standards in the area of applications development tools will provide common user interfaces, increase software development productivity, and provide for software portability.

- Workstation Power: The increasing power of new workstation platforms is creating market opportunities for programs incorporating the capabilities of these machines. In particular, the networking capabilities inherent in these computers are creating market opportunities for multitasking and multiuser applications.

- Industry-Specific Thrusts: Much of the applications software written in the 1970s was of the "plain vanilla" type. Now the demand is increasing for software to solve more in-depth processing pertinent to a specific industry.

- Executive Information Systems: The need is developing to provide free-form access to corporation information sources, including data bases, particularly for corporate decision-makers.

- Application Complexity: There is now a need to provide second and third generations of applications software for business, including a higher level of integration and embedded intelligence.

Additional driving forces that are continuing to positively impact growth in the systems software products market—shown in Exhibit III-8—include the following:

EXHIBIT III-8

DRIVING FORCES
SYSTEMS SOFTWARE PRODUCTS MARKET

- Staging for New Applications Software Growth
- Data Center Management Tools
- RDBMS
- SAA
- Cooperative Processing
- Image Processing
- CASE/4GL
- Standards (SQL/UNIX)

- Staging for New Applications Software Growth: The increasing demand for more-complex applications software solutions is fueling the demand for new, more powerful and flexible applications development tools.

- Data Center Management Tools: As data centers become more complex, a trend toward consolidation emerges. Opportunity for efficiency is provided through investment in automated software tools to operate and tune these centers.

- RDBMS: Most computer systems specifications today require the new relational data base management system products, as opposed to older hierarchical ones.
- SAA: The portability benefits of SAA will encourage independent software developers to create new software to meet SAA requirements. A high percentage of software written in the 1990s will be SAA-compliant.
- Cooperative Processing: The ultimate goal of a truly distributed processing environment is cooperative processing, which maximizes the efficiencies of all computers in a network. This technology will require new generations of software products, particularly in the areas of network, operating, and data center management systems.
- Image Processing: To reduce the increasing paper overflow problem in many industries, systems solutions that involve image processing capabilities will continue to gain acceptance.
- CASE/4GL: The need to improve software development productivity via 4GL languages and more-integrated structured programming methodologies will cause these tools to continue their rapid growth in popularity.
- Emerging standards for UNIX, SQL, and other functional areas will cause significant demand for new software conforming to these standards.

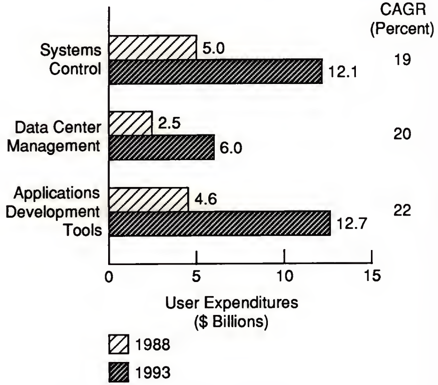
The three submodes of systems software are high-growth markets, as seen in Exhibit III-9. Application development tools will be propelled by continuing demand for 4GLs, relational data base management systems, and computer-assisted software engineering (CASE) tools.

Systems control software is closely tied to the shipment of computer platforms, so much of this growth will be fueled by new computer products that boost equipment manufacturer sales.

Data center management systems are increasingly in demand as more-complex, networked systems are implemented. Measurement, monitoring, and control functions become even more crucial in keeping systems finely tuned and efficient.

EXHIBIT III-9

SYSTEMS SOFTWARE MARKET SUBMODES 1988-1993

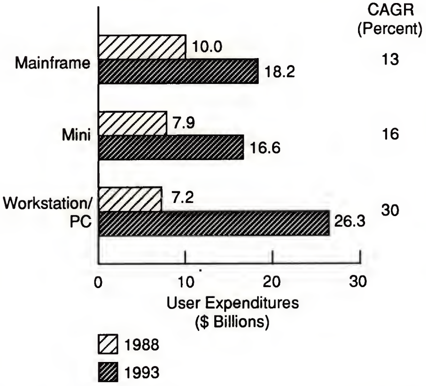


As shown in Exhibit III-10, software products' growth rates will vary widely by platform size, while exceeding the growth rates for the equipment. Although mainframe shipments may be increasing at no more than 3% per year, software to leverage the power of these expensive systems and provide connectivity among them will grow at a 13% rate over the next five years.

Similarly, minicomputer equipment growth rates will be only 5-6% in 1988, and this product class is being pressured by powerful, lower-cost personal computers and workstations. However, the IBM AS/400 and new product announcements from Digital Equipment and Hewlett-Packard will provide near-term momentum minicomputer shipments. Software growth in the 16% range is forecast for 1988-1993, as connectivity and distributed processing requirements create minicomputer software demand.

EXHIBIT III-10

TOTAL SOFTWARE PRODUCTS MARKET FORECAST BY PLATFORM TYPE 1988-1993



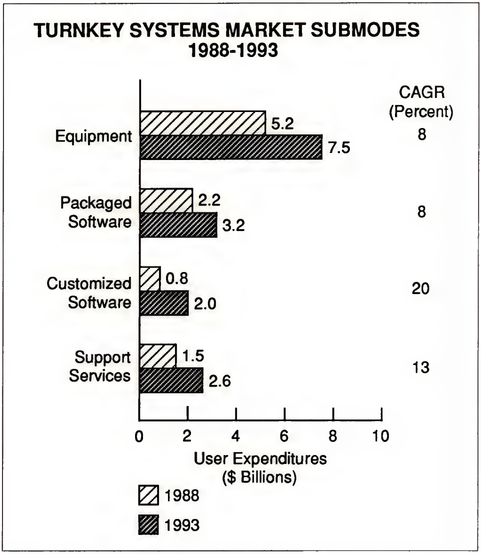
In the workstation/PC environment, a current 14% annual growth rate for PCs and an even higher 30% growth rate for workstations will strongly push the software market. INPUT forecasts a 30% growth rate in this category.

D

Turnkey Systems

The turnkey systems market is growing at the lowest rate of the seven information services delivery modes, a 10% CAGR. As shown in Exhibit III-11, equipment continues to represent the largest revenue component, even though profitability from the equipment is relatively low.

EXHIBIT III-11



Forces that will positively impact growth in the turnkey systems/VAR markets include the following, also shown in Exhibit III-12:

- Micro-based Solutions: New micro-based solutions with sophisticated standard software are expanding the market potential for turnkey systems/VAR suppliers in the smaller business environment.

- Customization: A major opportunity for VARs is in software customization for small- to medium-sized businesses, with the larger independent software companies and computer systems vendors stressing a standard product strategy.

- Growth of Support Services: Many turnkey systems suppliers/VARs can grow faster and provide a more stable revenue base by expanding into related product support services.

- Software Applications Required: There is an increasing need for software applications for industry-specific solutions, as opposed to the more generic applications that have constituted the first wave of computer systems applications purchases.

- Account Control at Low End of Spectrum: Computer systems vendors are courting turnkey systems suppliers/VARs to market their lower-priced computer systems and to address a customer base that cannot be profitably reached through the computer systems vendors' direct sales forces.

EXHIBIT III-12

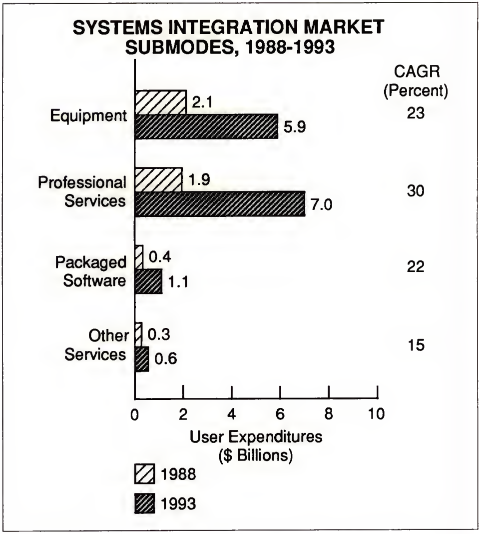
DRIVING FORCES
TURNKEY SYSTEMS MARKET

- Micro-based Solutions
- Customization
- Growth of Support Services
- Software Applications Required
- Account Control at Low End of Spectrum

E
Systems Integration

The newest delivery mode identified by INPUT, systems integration, is growing at a rapid 25% rate from a relatively small base. Exhibit III-13 shows the specific submodes and their growth rates. Although equipment currently represents the largest portion of SI expenditures, professional services will grow more rapidly in the next few years, emphasizing the value of consulting, education and training, and systems operations in this complex environment. For more information on this emerging market, see INPUT's 1988 Systems Integration Program reports.

EXHIBIT III-13



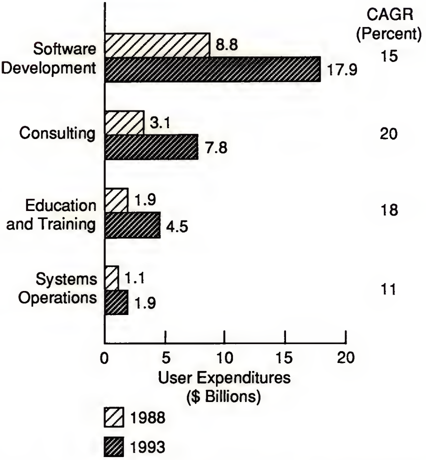
F

Professional Services

The professional services market will grow at 16% over the forecast period. As shown in Exhibit III-14, this growth will be led by software development, the largest contributor. Even though as much as 10% of expenditures identified as professional services in 1987 have now been recategorized as systems integration, this delivery mode still contains significant opportunities for many vendors. Nearly all providers of information services products may enhance their revenues and protect customer bases by introducing these services to their own clients.

EXHIBIT III-14

PROFESSIONAL SERVICES MARKET SUBMODES, 1988-1993



As shown in Exhibit III-15, numerous driving forces will continue to positively impact growth in the total professional services market.

- Software/Processing/Turnkey Vendor Positioning: Many of these vendors are beginning to offer professional services.

- Vendor Alliances: Combinations of capabilities are creating opportunities for performing larger, more complicated assignments.

- Diminished Skilled Labor Pool: With the shift in demographics toward an older population, a shortage of highly trained workers in certain specialty areas could develop. This shortage will provide opportunities for professional services tasks to be performed by outside companies that can provide specialized skills, particularly as applications become more complex.

- Project Control Methodologies: Increased use of project management software, as well as recent refinements in these methodologies, improves the capability of delivering contract programming and design functions.

- Lack of Information Services In-House Expertise and Rising Labor Costs: With the increasing shortage of skilled personnel in the information services area and related rising labor costs, it is often less costly to use outside professional services firms on a project-by-project basis, rather than hiring permanent staff.

- Low-Cost Market Entry: The low-cost market entry environment encourages new players.

- Systems Complexity: With the increasing complexity of many information services applications, the talent pool of many companies is not capable of addressing diverse needs. Thus, it becomes necessary to contract with outside suppliers.

EXHIBIT III-15

DRIVING FORCES— PROFESSIONAL SERVICES MARKET

- Software/Processing/Turnkey Vendor Positioning
- Vendor Alliances
- Diminished Skilled Labor Pool
- Project Control Methodologies
- Lack of Information Services In-House Expertise
- Rising Labor Costs
- Low-Cost Market Entry
- Systems Complexity

IV

Conclusions

The overall information services market will continue solid growth throughout the forecast period. The industry growth rate will outperform the U.S. GNP by more than a factor of two. Even the least dynamic sectors offer good growth potential.

There is the possibility of a slowdown in the economy in general, and information services as well, in 1989 to 1990. PC shipments, and minicomputers shipments as well, may decline, creating a drag on information services markets. However, this decline would probably be a short-term cycle, with a quick rebound anticipated.

Opportunities for vendors are best defined as vertical or niche-oriented. The caveat here is that many specific niches are already crowded, so new or expanded markets must be selected with care.

Paradoxically, vendors can gain significant market position by providing complete solutions or expanded services within any market they serve. A key to success will be the provision of presale and postsale support as well as products. Exhibit IV-1 shows this concept.

Mergers and alliances will continue to be necessary for vendor growth—and in some cases, survival—in the face of increasing competition and requirements for delivery of more-complex solutions.

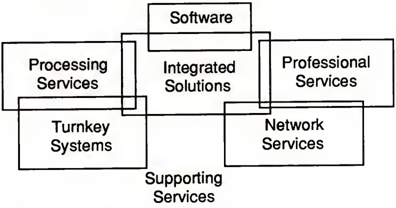
Emerging equipment, software, and communications standards will directly affect most vendors. Tracking these standards and building strategic plans that recognize standards will be crucial to continued vendor growth.

Services and software that can minimize the time to deliver will place vendors in a stronger position in any market. Long lead times and large development backlogs constrain timely delivery by in-house information systems departments in many enterprises.

EXHIBIT IV-1

INFORMATION SERVICES MARKET STRUCTURE
1990s

(Emphasis on Supporting Services)



A recent trend is the gradual loss of procurement control by information systems managers as end users become more aggressive in specifying their own solutions. This loss of control will require altered vendor sales and marketing strategies.

Finally, international opportunities should not be overlooked—growth rates in Western Europe and the Pacific Rim will exceed those in the U.S.

Exhibit IV-2 provides a recap of recommendations and conclusions for vendors in the information services markets.

EXHIBIT IV-2

CONCLUSIONS AND OPPORTUNITIES FOR VENDORS

- Overall Market Remains Vital
- Possible Slowdown in 1989-1990
- Many Opportunities Will Be Vertically Oriented
- Solutions, Not Just Products, Are Key
- Paradoxically, Breadth of Services/Products Enhances Market Position
- Alliances and Mergers Necessary for Growth (and Even Survival) for Many Vendors
- Vendors Must Recognize Impact of Standards
- Rapid Response to User Needs is a Key to Success
- End-Users Will Control the Major Purchase Decisions
- Seek International Opportunities

About INPUT

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

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

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

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

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