U.S. TURNKEY SYSTEMS / VAR MARKETS

1988 - 1993

INPUT

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.

INPUT OFFICES

North America

Headquarters
1280 Villa Street
Mountain View, CA 94041
(415) 961-3300
Telex 171407 Fax (415) 961-3966

New York
Parsippany Place Corp. Center
Suite 201
959 Route 46 East
Parsippany, NJ 07054
(201) 299-6999
Telex 134630 Fax (201) 263-8341

Washington, D.C.
8298 C, Old Courthouse Rd.
Vienna, VA 22180
(703) 847-6870 Fax (703) 847-6872

International

Europe
INPUT LTD.
Piccadilly House
33/37 Regent Street
London SW1Y 4NF, England
01-493-9335
Telex 27113 Fax 01-629-0179

INPUT s.a.r.l.
29 rue de Leningrad
75008 Paris, France
01-44-80-48-43
Fax 01-44-80-40-23

Japan
FKI, Future Knowledge Institute
Saida Building,
4-6, Kanda Sakuma-cho
Chiyoda-ku,
Tokyo 101, Japan
03-864-4026 Fax 001-03-864-4114

DECEMBER 1988

U.S. TURNKEY SYSTEMS/VAR MARKETS

1988-1993

INPUT®

1280 Villa Street, Mountain View, California 94041-1194 (415) 961-3300

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

Market Analysis Program
(MAP)

U.S. Turnkey Systems/VAR Markets, 1988-1993

MAD2 • 332 • 1988

Abstract

This annual report provides insight, analysis, and expenditures forecasts for the U.S. turnkey systems/VAR market from 1988 to 1993. Market size and growth rates are provided for 15 industry-specific market segments as well as for seven cross-industry market segments.

The issues, trends and events driving the market are presented and analyzed. Market factors are discussed to provide a basis for the turnkey business and its future growth and direction. Business and market strategy suggestions are provided.

The report contains 81 pages and 26 exhibits. It is part of a four-volume series describing the information services market and its mode of delivery. The three other volumes are: *U.S. Processing/Network Services, 1988-1993*; *U.S. Software Products, 1988-1993*; and *U.S. Professional Services, 1988-1993*.

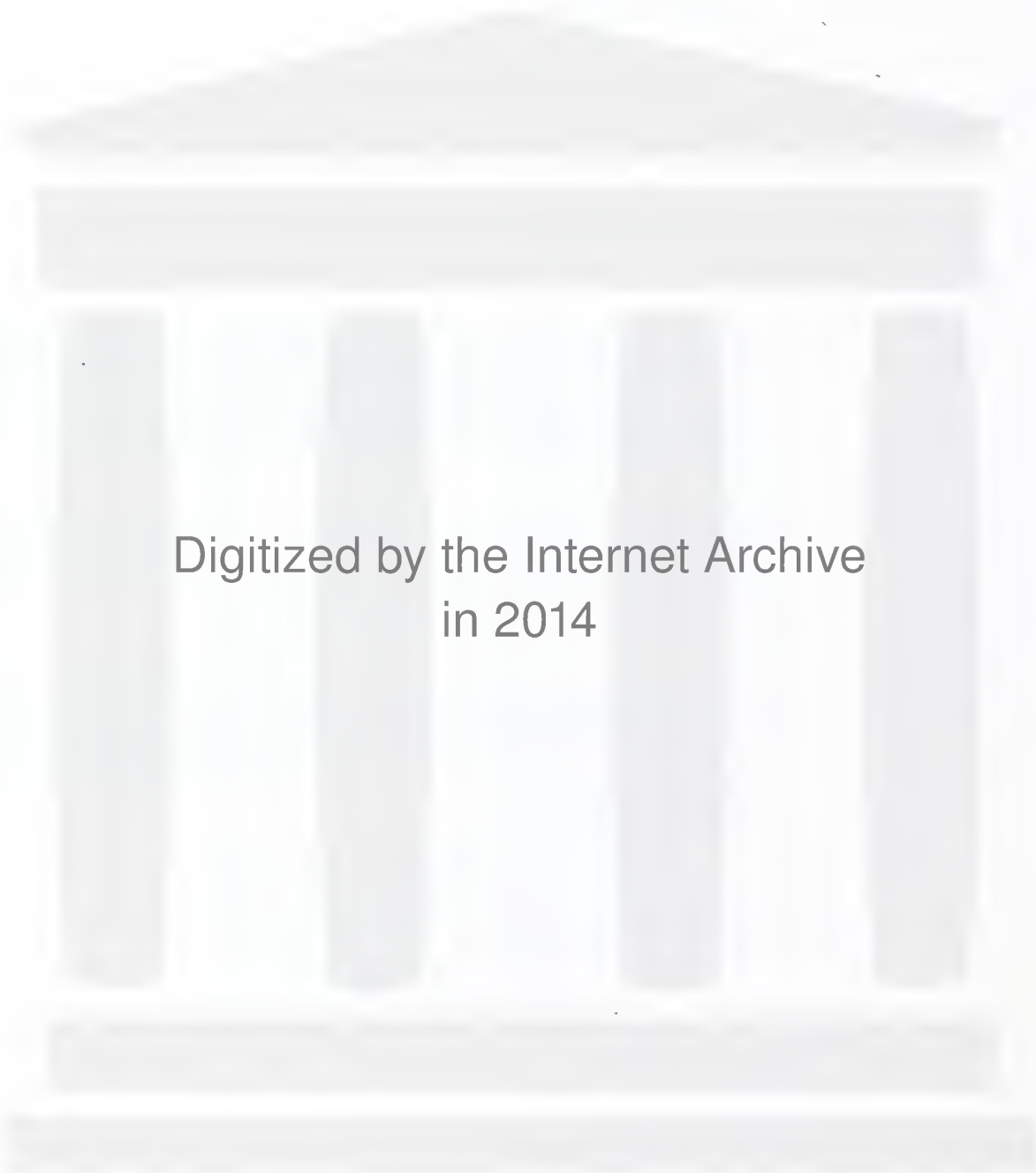
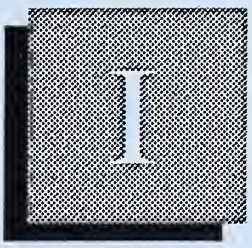


Table of Contents

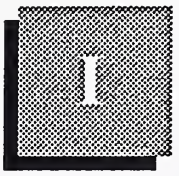
Table of Contents (Continued)

Exhibits

Exhibits (Continued)



Introduction



Introduction

This report is produced as part of INPUT's Market Analysis and Planning Service (MAPS) program for the information services industry. It is one of five annual reports on the delivery modes that make up the information services industry. The other reports cover software products, network/processing services, professional services, and systems integration.

A

Purpose of Report

This report investigates the turnkey systems mode of delivery for the information services market.

Turnkey systems/value-added resellers (VARs) vendors and suppliers will benefit from this report in the following ways:

- By identifying possible new markets and product opportunities to complement existing strategies
- By assessing the risk and investment risk/exposure
- By assisting in the business planning function to determine an overall business perspective
- By providing information on the issues, trends, and developments shaping the turnkey systems/VAR markets

B

Scope

The report reviews the U.S. market for events, issues, and developments that impact the turnkey systems market. User expenditures provided are those that are noncaptive. Noncaptive expenditures are those made to organizations outside of the company making expenditures.

The report is organized into five chapters as follows:

- Chapter II is an Executive Overview of the material presented in the entire report. It is designed for the executive or individual who requires the major/significant material, yet does not have the time to read the entire report.

- Chapter III presents the five-year market forecast (i.e. 1988-1993) and analyzes the turnkey systems/VAR market in terms of the industry-specific and cross-industry sectors.

- Chapter IV provides a discussion of events, trends, and issues that are driving the market.

- Chapter V looks at the competitive structure of the turnkey systems marketplace and provides rankings of the leading turnkey systems/ VAR vendors in size and growth.

- Chapter VI focuses on conclusions and recommendations.

- Appendix A contains INPUT's definitions for terms used in the report.

- Appendix B contains the market forecast data base used in the report, showing market sizes and growth rates.

- Appendix C provides a reconciliation between INPUT's 1987 market forecast for the turnkey systems/VAR market made in its *1987 Information Services Industry Report*, and the actual market size in 1987, as determined in its 1987 market survey results. A current five-year market forecast is also provided and reconciled with INPUT's five-year market forecast made in 1987.

Included as participants in the turnkey systems market are the numerous value-added resellers (VARs) that provide hardware/software systems total solutions to the end user. The terms turnkey systems supplier and value-added reseller have come to overlap in recent years. Therefore, in this year's annual report on the turnkey systems delivery mode, INPUT links the two terms. If a distinction still remains between the two, INPUT believes it is more in terms of the larger size of the traditional turnkey systems company and the greater degree of hardware modification along with some private labeling sometimes done by the traditional turnkey systems suppliers. VARs, on the other hand, tend to do more software customization. Both, however, emphasize value-added, usually turnkey, solutions for industry-specific or cross-industry markets.

The turnkey systems company designation is associated with such large providers as Daisy Systems, ASK Computer Systems, Triad, Computervision, and Integraph, which originally focused on providing

bundled hardware/software solutions as well as an emphasis on maintenance services. Historically, many of these companies provided a proprietary or customized hardware product component but today may OEM a hardware platform from a computer systems vendor. Many of the traditional turnkey systems companies also are now unbundling their hardware and software and services offerings, and providing more emphasis on software and services.

In particular, many turnkey systems vendors are significantly expanding the services portion of their businesses, such as consulting, hardware and software maintenance, software customization, and systems integration. Likewise, many smaller VAR have also altered product strategy to provide more of a service emphasis.

Both types of vendors—turnkey systems and VARs—now tend to provide industry-specific (vertical) and cross-industry (horizontal) software offerings, either developed internally or provided by other VARs, software houses, or third-party applications developers.

Another twist in this definition is provided by the computers systems vendors, many of whom are now beginning to stress total solutions: i.e., industry-specific marketing. The applications software portion of their product offering is often based on an OEM arrangement, or can be part of a joint marketing arrangement with an independent software developer that may also be a VAR.

INPUT currently defines a turnkey systems/VAR supplier as providing the products and services indicated in Exhibit I-1.

In addition, a customization spectrum of product offerings in the value-added reseller market should also include systems integration. As mentioned, many turnkey systems/VAR vendors are expanding into systems integration services, and, in turn, more systems integrators are providing turnkey solutions—but as part of a multivendor hardware/software solution. Exhibit I-2 shows INPUT's customization spectrum model for distinguishing between turnkey systems suppliers, VARs, and systems integrators.

INPUT does not include systems integrators in the turnkey systems/VAR general marketing channel. Although the end product from both sources is usually a turnkey solution, there are some fundamental differences in terms of the scope/complexity, length, and cost of their respective solutions.

EXHIBIT I-1

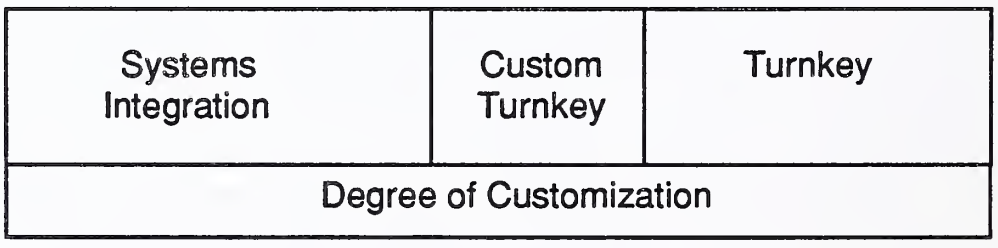
DEFINITION OF A TURNKEY SYSTEMS/VAR SUPPLIER

Industry-Specific Solutions

- Including:
  - Hardware System
  - Application Software
  - Documentation
  - Installation
- Some May Offer:
  - Cross-Industry Solutions
  - Consulting Services
  - Custom Programming
  - Maintenance Services
  - Data Center Management
  - Modified Hardware
  - Horizontal Applications

EXHIBIT I-2

THE CUSTOMIZATION SPECTRUM



For similarities between systems integrators and turnkey systems suppliers, see Exhibit 1-3.

Differences between systems integrators and turnkey systems/VAR suppliers are included in Exhibit I-4.

EXHIBIT I-3

SIMILARITIES BETWEEN SYSTEMS INTEGRATORS AND TURNKEY SYSTEMS SUPPLIERS

- Prime Contractor's Role
- Multiple Vendors Involved
- Equipment Delivery
- Software Customization
- Installation, Training, and Support
- Postinstallation Support

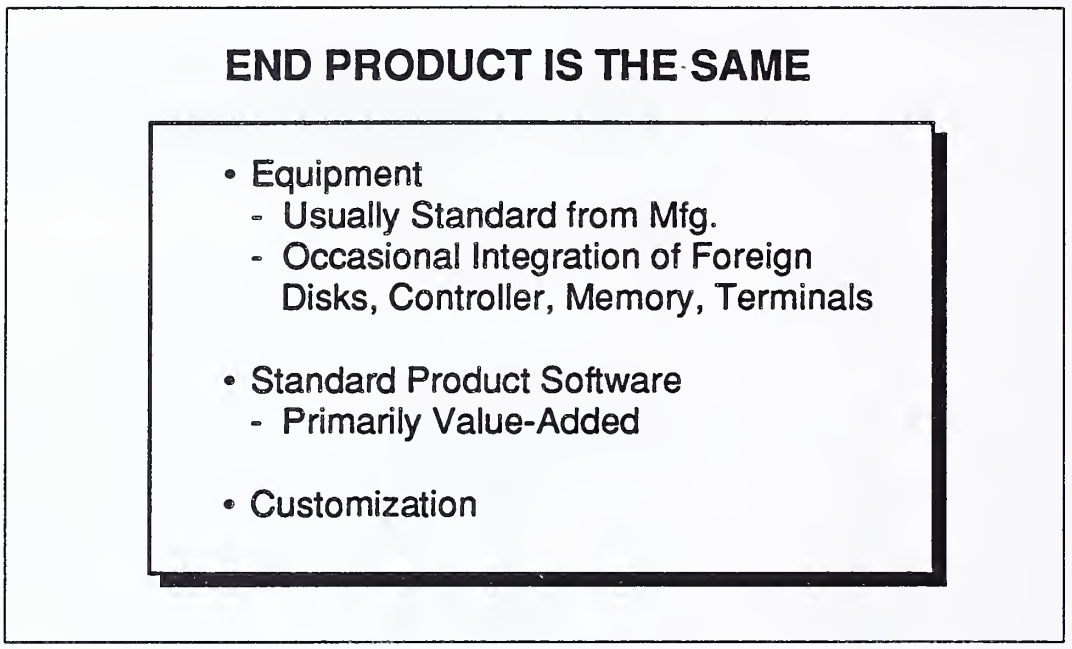
EXHIBIT I-4

DIFFERENCES BETWEEN SYSTEMS INTEGRATORS AND TURNKEY SYSTEMS VENDORS

Systems Integration	Turnkey Systems
Strategic Design and Consulting	Tactical Consulting
Mulltiyear Effort	Single-Year Time Span
High-Level Complexity	Modest Complexity

However, as indicated in Exhibit I-5, the end result is basically the same with turnkey systems/VAR suppliers and the systems integrators.

EXHIBIT I-5



C

Information Services Industry Structure

Exhibit I-6 defines the scope of the information services industry that is tracked and analyzed by INPUT and shows seven major delivery modes. In past years there have been only four. One change is that processing/network services, which was a single category, has now been divided into two: processing services and network/electronic information services. Similarly, systems integration, previously a submode of professional services, is now a separate mode. The rapid growth of systems integration has prompted INPUT to create a separate market category and report written specifically for systems integration. Annual market reports are written for each of the delivery modes shown, with detailed discussions of all submodes.

D

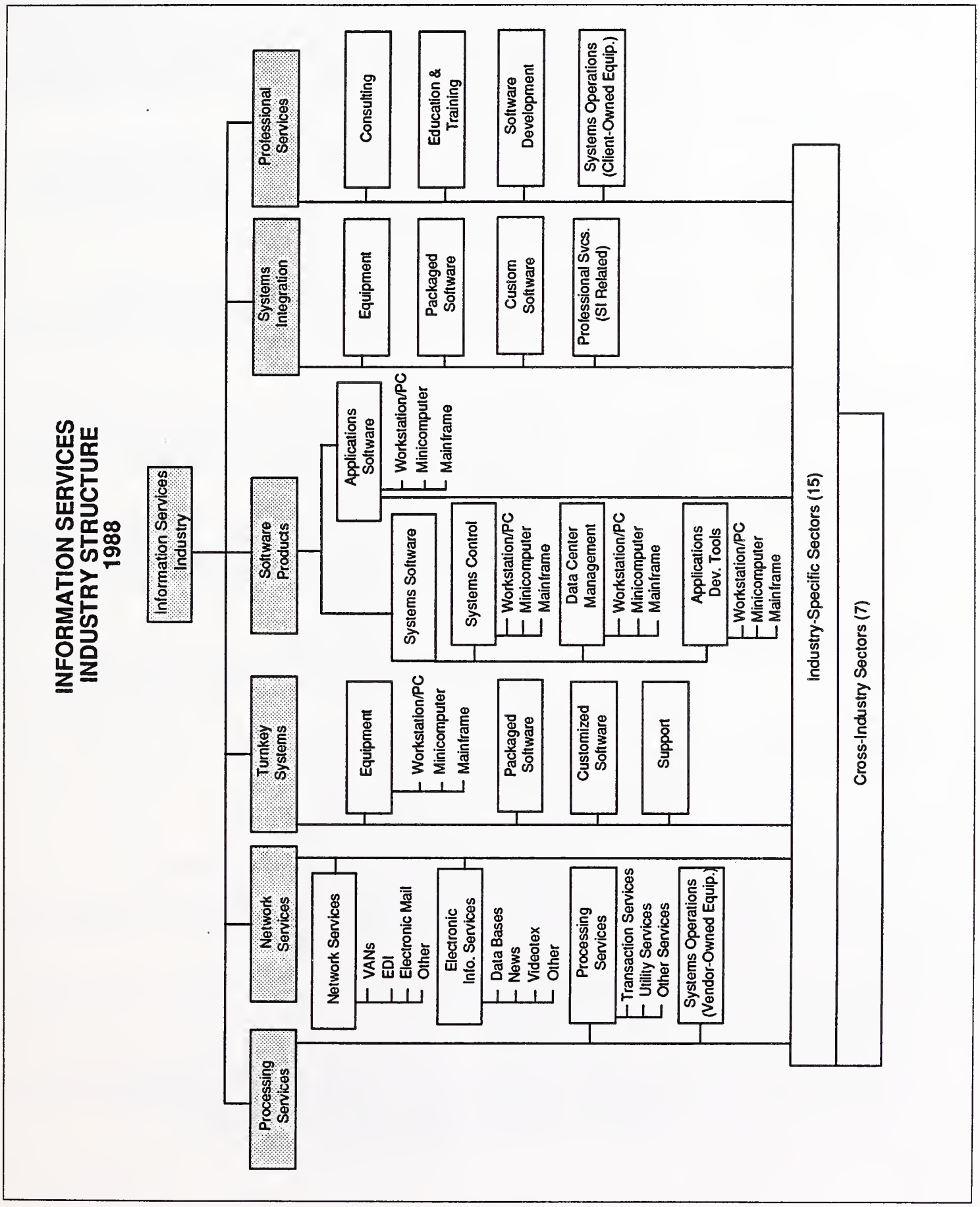
Research Methodology

At INPUT the forecasting process occurs on a continuous basis. There are two basic approaches INPUT has used over the years to analyze the information services industry. These approaches are as follows:

- Use of specific interviews in each of the industries surveyed. This provides a direct interaction and dialogue that is key to an accurate understanding of issues, trends, needs, and developments shaping the markets.

- Use of ongoing monitoring approach of all turnkey systems vendors with annual revenues of more than $10 million. In addition, a sampling of smaller firms provides an estimate of the size and growth of the smaller-firm segment of the industry. However, INPUT does not survey companies less than $250,000 in revenues.

EXHIBIT I-6



These two approaches complement each other, and INPUT researchers are able to quantify the market size and growth and generate the forecasts included within the report. Industry trends, directions, and events are monitored and discussed with the vendors. Technology, governmental regulatory processes, standards, and other industry factors are included in the forecast parameters and dimension.

During the second quarter of 1988, INPUT conducted in-depth interviews with 910 information services vendors, including nearly all of the largest 250 firms. The smallest of the 250 firms generated about $20 million in U.S. revenues in 1987.

Of the total 910 companies, the smaller 660 ranged in size from $250,000 to $20 million in annual revenues. Collectively, revenue from all 910 firms represented 70% of the total information services industry revenues.

In the minority of survey contacts of larger vendors, revenues were not available. In these cases, INPUT estimated revenues from its own contacts and secondary sources. This procedure was followed for all identified firms above $10 million in annual revenues.

For smaller firms, with revenues below $10 million (and not specifically covered in the survey), INPUT created its own estimates based on the number of such firms identified in each delivery mode and the expected average annual revenue of such firms.

The sum of these surveys and estimates produced the initial vendor revenue estimates for 1987. From this figure, INPUT subtracted revenues identified as:

- International (non-U.S.)
- Captive within any organization
- Acquisitions (only for growth rate calculations)

The revenue data in this report include only the following:

- U.S. revenues—Only revenues derived from products or services sold in the U.S. All foreign revenues are excluded.

- Information service revenue—Revenues from turnkey systems products and services only.

- Noncaptive revenues—Only revenues available to all vendors in a competitive marketplace are included. Revenues derived from sales to the partners of affiliated organizations are excluded.

- Calendar-year revenues—Approximately 30% of the vendors surveyed have fiscal years that do not coincide with calendar years. Revenues of these companies have been adjusted to a calendar-year basis for consistency.

- Rounding to the nearest $1 million for specific vendors was done to normalize for the lesser degree of accuracy where data was estimated by INPUT.

- Revenues reported by private companies, subsidiaries of larger corporations, computer manufacturers, and CPA firms are generally subject to a wider margin of error than revenues of other companies.

Companies that are not exclusively involved in information services are identified as follows:

- If a division or its subsidiary markets all information services for a company and is generally known by the name of that group, then it is identified by that name rather than the parent's name.

- If more than one division or subsidiary markets information services, the information is included in, and identified by, the parent's name.

- Organizations are reported according to their legal status as of the end of December 1987.

Companies have been classified according to delivery mode of service from which they derive the largest proportion of their U.S. noncaptive information service revenues.

Total base year (1987) revenues are then separated into six delivery modes and twenty-two vertical/cross-industry segments for closer analysis and five-year forecast projections.

INPUT considers industry revenues to include two separate subsets of data: (1) user expenditures, which equate with market size, and (2) vendor revenues. For certain delivery modes, vendor revenues and user expenditures are fairly close. However, many microcomputer software products, for example, are marketed through indirect distribution channels, such as retail stores, OEMs, and VARs, where conversion factors must be applied to determine the total market size from vendor revenues. In addition, some software is sold by vendors into other information services sectors, such as processing and network services companies. This software could be used in these other information services sectors' data centers and never passed on to an end user. INPUT deletes such intra-industry transactions from its user expenditures market.

The following table shows the various conversion factors used by INPUT to convert vendor revenues to end-user expenditures (market size) figures for each delivery mode:

• Application Software	1.18	(reflecting retail stores, etc.)
• Systems Software	1.10	(reflecting retail stores, etc.)
• Turnkey Systems	.99	(a reduction due to intra-industry transactions)
• Systems Integration	.99	(a reduction due to intra-industry transactions)
• Professional Services	.99	(a reduction due to intra-industry transactions)
• Network Services	.99	(a reduction due to intra-industry transactions)
• Processing Services	.99	(a reduction due to intra-industry transactions)

For the 1987 user expenditures defined, INPUT projects five-year market growth rates for each delivery mode and vertical/cross industry market, based on its own analysis of technology, economic outlook, vendor activity, and driving and inhibiting forces affecting each market.

E

Economic Assumptions

Forecast numbers are presented in current dollars (i.e., 1992 market sizes are in 1991 dollars). In developing the five-year forecast (See Exhibits I-7 and I-8), INPUT has incorporated the following economic assumption regarding the outlook for the total U.S. economy, and the impact on the turnkey systems delivery mode within the information services industry:

- The price deflator applied to the nominal growth rate projection for the turnkey systems/VAR delivery mode reflects INPUT's estimates of the percentage of the total inflationary rate increase (as measured by the GNP price deflator), which this delivery mode will be able to pass along through price increases.

INPUT projects that the total information services market will expand at a 17% compound annual growth rate (CAGR) over the next five years, from $80 billion in 1988 to $175 billion in 1993. For 1987, the information services market totaled $67 billion, representing a 20% growth rate over 1986. The 1987-1988 growth rate was 18%.

EXHIBIT I-7

GNP NOMINAL GROWTH RATE ASSUMPTIONS (Percent)

	1987A	1988A	1989E	1990E	1991E	1992E	1993E
Real GNP	3.4	3.8	2.8	2.5	2.8	3.0	3.0
GNP Deflator *	3.3	3.4	5.5	5.0	5.0	4.5	4.5
Nominal GNP	6.7	7.2	8.3	7.5	7.8	7.5	7.5

* Year-to-Year Comparison

EXHIBIT I-8

GROWTH RATE BY DELIVERY MODE (TURNKEY SYSTEMS/VARs)

	1987A	1988E	1989E	1990E	1991E	1992E	1993E
Real Growth	9.3	10.3	8.2	7.5	6.5	6.7	6.7
Price Deflator	1.7	1.7	2.8	2.5	2.5	2.3	2.3
Nominal Growth	11.8	12.0	11.0	10.0	9.0	9.0	9.0

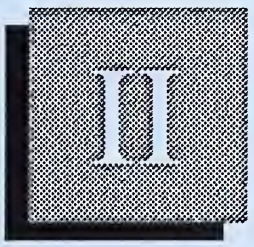
The anticipated modest decline in the annual growth rate reflects INPUT's projection of a slowing in real GNP growth over the next two to three years. Real GNP growth is projected to decrease from a 3.8% annual rate in 1988 to a range of between 2.5% to 2.8% over the next three years before returning to the 3% range in the early 1990s. In addition, the inflation rate, as measured by the GNP deflator, is expected to increase modestly between 1988 and 1993.

Primary expectations affecting INPUT's outlook for nominal GNP growth rates over the next five years include a continuing slowdown in consumer spending, related to modest increases in real consumer income; further slowing in the rate of increase in federal defense spending, related

to the need to reduce the federal budget deficit; product-cycle maturation in certain key technology sectors, such as the low end of the personal computer market and in minicomputers; and higher interest rates, particularly in the near term, reflecting pent-up inflationary cost pressures.

Historically, the information services industry has been more resilient to slowdowns in real GNP growth (reflecting unit shipments) than have companies in the electronic components and equipment sectors. However, the ability to pass on inflationary pricing pressures is more varied in the information services industry, reflecting the particular labor/material mix in the cost structure of individual delivery modes.

The turnkey systems/VAR delivery mode is the most vulnerable mode to a slowing in real GNP growth in the information services industry. This high vulnerability is due in large part to the relatively high content of hardware in many turnkey systems solutions and the trend to commodity pricing in many computer market segments, such as PCs and general purpose workstations. In addition, the turnkey systems/VAR industry is characterized by a large number of smaller participants, many of which are undercapitalized and find it hard to survive economic slowdowns. The new issues public stock market has also not been particularly receptive to VARs. However, a counterbalancing force is the move on the part of many large computer systems companies to begin emphasizing total solution (turnkey systems) marketing. But this also creates a strong new competitive force to be reckoned with in the turnkey systems/VAR markets.



Executive Overview

II

Executive Overview

A

Turnkey Systems/VAR Markets

INPUT subdivides the information services market into seven delivery modes: applications software, network/electronic information services, processing services, professional services, systems integration, systems software, and turnkey systems.

Of these seven delivery modes (markets), the fastest growing in 1987 was network/electronic services at 28%, and the slowest growing was turnkey systems at 11%. The total information services market, reflecting the average growth rate of all seven delivery modes in 1987, was 20%.

The turnkey systems/VAR market at $8.7 billion in 1987 was slightly ahead of INPUT's 1987 forecast of $8.6 billion.

These market size figures are in current dollars, reflective of an inflation rate of 3.3% in 1987, as measured by the GNP implicit price deflator.

Positively affecting the turnkey system/VAR markets in 1987 were performance turnarounds in some of the older turnkey systems companies following new product introductions, earlier acquisitions and restructurings, and the stronger-than-expected strength in the general economy. The smaller VAR markets also benefited from the continuing trend of downsizing of computer hardware platforms; the market strength, in particular vertical software markets such as desktop publishing and general office systems; and the increasing penetration of turnkey systems automation solutions in the small to midsize business environments. In addition, several of the leading workstation and desktop computer manufacturers, such as Sun Microsystems, Apple Computer, and Compaq Computer, initiated aggressive VAR recruitment programs in 1987, reflecting in part a perceived need to utilize more third-party marketing to more cost-effectively market their lower-priced computer systems.

INPUT subdivides the turnkey systems/VAR market into four submodes: equipment, packaged software, custom software, and support. Of the total turnkey systems market in 1987, equipment represented 55% of the total market, with the second-largest segment being packaged software. However, by 1993, the equipment portion of the turnkey systems sale is expected to decline to 49% of the total market, with customized software and support services showing gains. The portion represented by packaged software is also expected to decline as shown in Exhibit II-1.

The peripherals add-on market has been strong, particularly for VARs in recent years, partly due to the fact that the open architecture IBM PC and the PC clone manufacturers did not include hard disk storage in much of their personal computer products. In addition, Apple Computer's introduction of the open architecture Mac II in 1987 was another boon to VARs seeking to expand hardware add-on revenues.

However, IBM is now shipping most of its PS/2 personal computers with hard disk drives and greater RAM memory (reflecting similar trends at Apple Computer and Compaq Computer). These changes negatively affect the smaller VARs that provide Winchester drive upgrades as part of their value-added services. The market for memory upgrades from floppy disk to hard disk storage also probably peaked in 1988. This peak has been reflected in recent revenue shortfalls experienced by Seagate Technology, the largest supplier of hard disk drives to the VAR/distributor market.

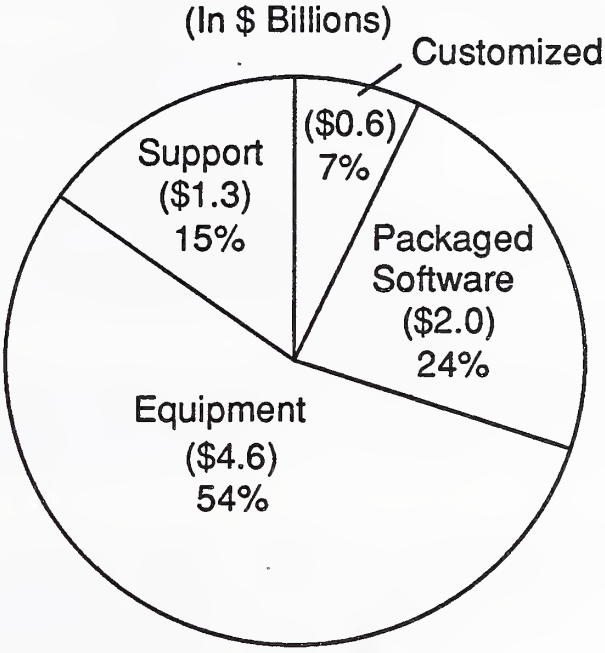
Also, many other hardware products are becoming commodity-type products with lower prices and profit margins. As a result, for turnkey systems/VARs revenues to grow and for profit margins to increase, greater emphasis is placed on sales of software and services. For the more successful turnkey systems/VAR suppliers, this strategy has lead to increasing the emphasis on software development as well as obtaining additional software products, either through acquisition, strategic (marketing) alliances, or through software licensing. Service extensions include greater emphasis on product customization, consulting, MIS facilities management, education/training, maintenance, and systems integration solutions, such as multivendor networking.

In addition, many types of software products, particularly in the office systems environment, are also becoming commodity items with very similar functionality. As such, the key to providing future revenue growth and to maintaining profit margins is to provide increased value added through specialized/customized proprietary software, with an emphasis on vertical market niches—along with integration of software and hardware—and enhanced services. Therefore, a need to maintain account control by expanding the solutions capability is suggested.

EXHIBIT II-1

TURNKEY SYSTEMS/VAR MARKETS BY SUBMODES—1987

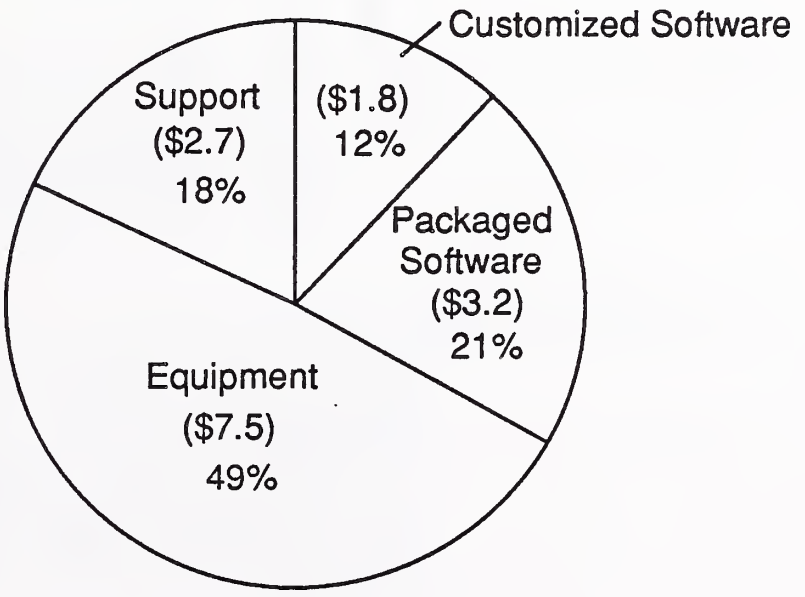
(In $ Billions)



Total Market = $8.5 Billion

TURNKEY SYSTEMS/VAR MARKETS BY SUBMODES—1993

(In $ Billions)

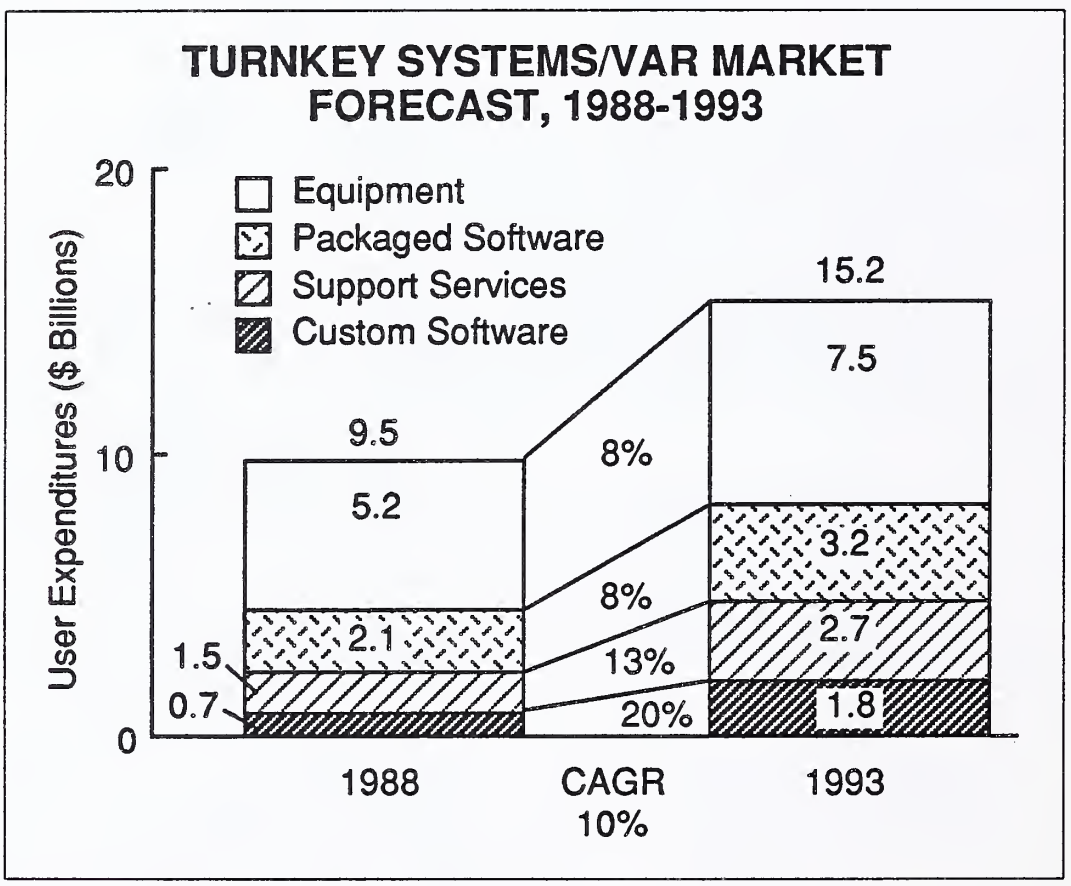


Total Market = $15.2 Billion

As such, hardware suppliers, independent software vendors, and retailers, along with the more traditional turnkey systems/VAR suppliers, are tending to broaden their product offerings to provide a more complete solution.

This trend suggests that the turnkey systems market, reflecting the total solution delivery approach, should continue to maintain a growth rate over the next five years that is at least in-line with the recent historical growth. INPUT is estimating that the turnkey systems/VAR markets will expand at a 10% average annual growth rate from 1988 through 1993 as shown in Exhibit II-2. INPUT's annual turnkey systems markets report in 1987 forecasts a 9% five-year growth rate for the turnkey systems market.

EXHIBIT II-2



The revised, slightly higher five-year growth expectation is based on the stronger-than-anticipated economy in 1988 and expectations of continued economic expansion at least through mid-1989, the renewed strength in 1987 and 1988 of several of the leading independent turnkey systems companies, and new VAR programs implemented by such major computers systems manufacturers as Apple and Sun Microsystems in 1987 and 1988.

INPUT is projecting that the workstation/PC platform market will grow at a 30% CAGR over the next five years, the minicomputer hardware market at 6 to 8% CAGR over the same time period, and growth in the mainframe equipment segment will be in the 3% CAGR range.

B

Turnkey Systems/ VAR Competitive Environment

Turnkey systems/VAR suppliers are facing increasing competition from computer systems vendors, professional services companies, systems integrators, and computer retailers that are providing more-complete applications solutions. In particular, among the leading computer systems vendors, IBM's Applications Software Development Division heralds a major new emphasis on application-specific software, in conjunction with its traditional hardware and systems software product offerings.

The turnkey systems solution, expanded to include more of a multivendor, systems integration approach, could very well become the dominant marketing approach of the leading computer system and independent software companies in the 1990s. This approach implies that turnkey systems solutions and systems integration will expand as a marketing approach, but the degree of competition will also increase significantly as the information services industry in general shifts to a more-integrated services marketing approach.

This approach will require particular specialized product and marketing strategies on the part of the independent turnkey systems/VARs in order to survive in a changing competitive environment.

C

Turnkey Systems/ VAR Strategies

INPUT has observed that over the past few years the following strategic approaches have proven successful among various turnkey systems/VAR suppliers:

- For larger turnkey systems/VARs:
  - A shift from providing proprietary hardware to more use of standard hardware platforms (a significant exception includes Intergraph)
  - Emphasis on new product development/and or acquisitions to increase potential available market
  - Participation in vertical, niche markets, with substantial size (more than $100 million) and being able to establish dominance in the chosen niche market
  - Proprietary software (with unique functionality) as a principal competitive approach
  - Emphasis on financial controls and the bottom line
  - Accessing the public capital markets
  - Increasing emphasis on services, such as consulting, maintenance, education/training, and leasing

- Emphasizing the current customer base for a recurring revenue source

- Downsizing of hardware system solution from minicomputers to workstation/PCs

- For the smaller VARs:

  - Product customization that provides protection from larger independent software companies

  - Specialization, such as in services—i.e., becoming a systems integrator (facilities manager) for small to midsized businesses.

  - Use of cross matching from other VARs and independent software developers to obtain additional products and to increase the breadth of solution provided.

  - An emphasis on the current customer base for recurring revenue source from product add-ons and services, such as consulting, education/training, maintenance, and facilities management.

Company profiles in Chapter V include discussion of some of these strategies.

D

Recommendations for Future Success

With a future turnkey systems/VAR market characterized by increasing competition from companies in many if not all of the other leading delivery modes, survival strategies for the independent turnkey systems/VAR will require a greater emphasis on value-added products and services, specialization, customization, and the resources to dominate chosen niche markets.

Particular recommendations include:

- Emphasize the current customer base with state-of-the-art software product additions, data base services and peripherals to provide stability of revenues and earnings (important to investors and creditors) as well as a lower marketing cost.

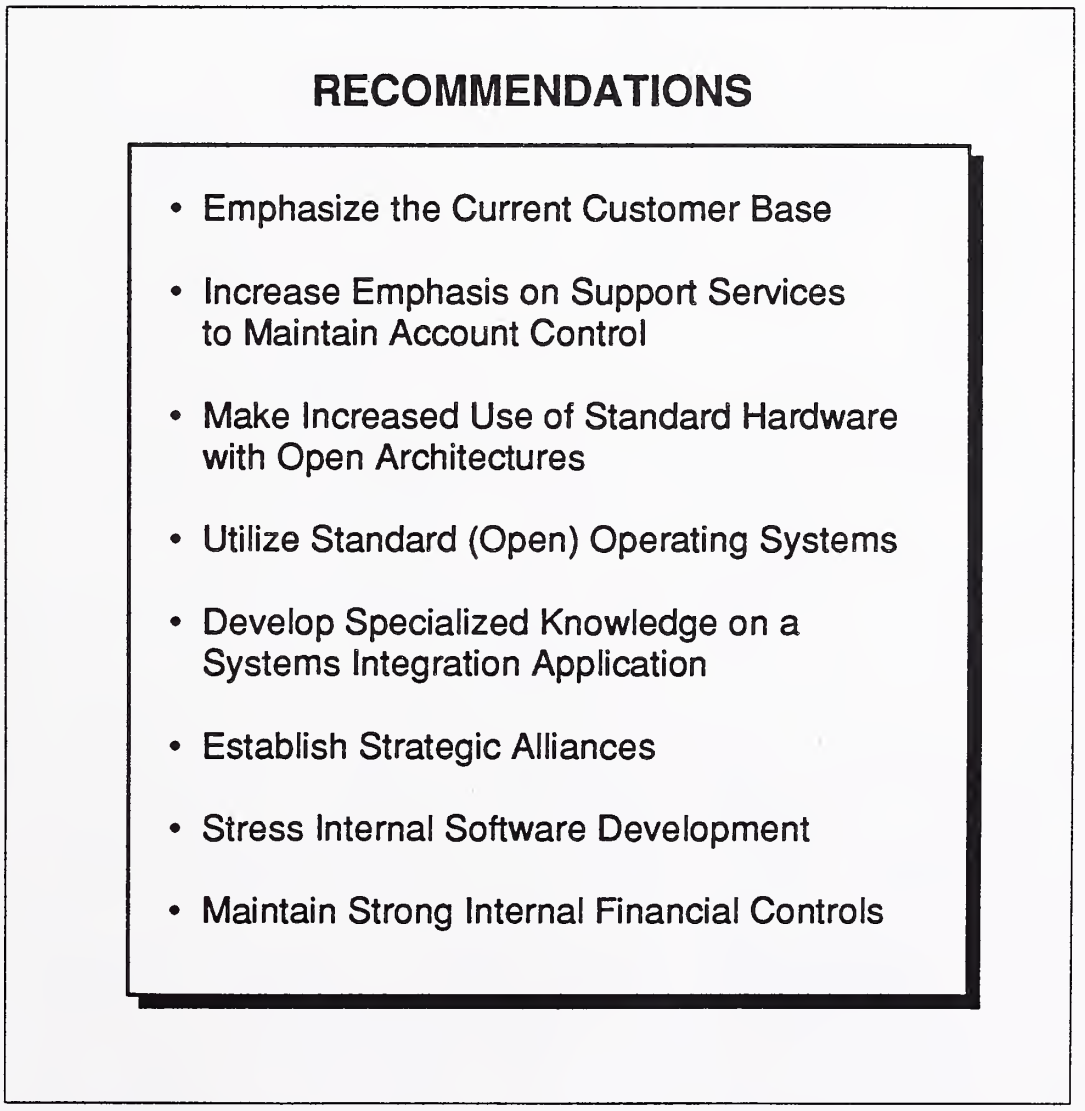
- Maintain account control and provide new revenue sources by increasing emphasis on services, such as consulting, facilities management, education/training, and maintenance. For smaller business, in addition, the VAR can often become the data processing arm of the company.

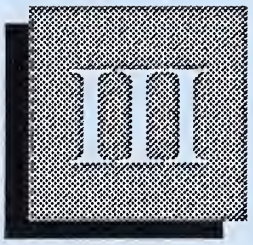
- Make increased use of standard hardware (open architecture) to increase software portability and product life cycles through add-ons and product upgrades.

- Consider the UNIX operating system as a possible lower-cost, multi-user alternative in a networked environment, as well as for software portability.
- Develop specialized knowledge in a systems integration application, such as network integration—multivendor connectivity, as well as the ability to integrate voice, data, text, and video information.
- Establish strategic alliances through marketing partnerships with strong companies in complementary markets.
- Stress internal software development along with strategic alliances and other forms of product cross matching to increase breadth and depth of a solution to a targeted industry market.
- Emphasize maintenance of strong internal financial controls.

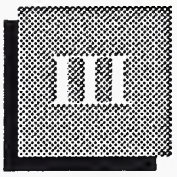
These recommendations are summarized in Exhibit II-3.

EXHIBIT II-3





Market Size and Forecast



Market Size and Forecast

A
Market Forecast

1. Five-Year Outlook: 1988-1993

The turnkey systems/VAR market in 1987 totaled $8.5 billion compared with a market size of $7.8 billion in 1986, which reflects an annual growth rate in 1987 of 9% INPUT had projected a 1987 market size of $8.6 billion for the turnkey systems/VAR in its 1987 turnkey systems annual report. The 1987 turnkey/VAR market reflected a strong general economy, turnaround performances by some of the larger turnkey systems companies from the 1985 to 1986 period when revenues and earnings had been negatively impacted by company restructurings, the digestion of acquisitions and temporary softness in certain economic sectors such as electronics.

INPUT is projecting an annual compound growth rate of 10% in the turnkey systems/VAR market from 1988 to 1993. This rate represents an increase from an estimated $9.7 billion market in 1988 to a $15.2 billion market in 1993. This estimate compares with the five-year forecast of 9% made by INPUT in 1987. The previously forecast market size figure for 1992 was $13.3 billion. The current 1992 market projection has been increased to $14.0 billion.

The slightly higher 10% rate in the current five-year forecast reflects the positive impact from the anticipated continuation of a trend to total solution marketing. This trend also relates to the increasing emphasis of the major hardware /software vendors on industry-specific, vertical markets, where tailored software applications are key to systems sales.

However, the increase in total solutions marketing strategies by computer systems vendors—where software represents an ever larger part of the total sale—also has a potential downside for the traditional turnkey systems/VAR suppliers. In addition, professional services and systems integration companies, along with valued-added retailers, are pursuing software and services opportunities by providing valued-added, total solutions.

However, the positive side to this for turnkey systems/VAR suppliers is that the independent VAR channel in particular often represents the most cost-effective method for the computer systems manufacturers to sell to smaller business and localized markets. As a result, the past two years have seen a major effort by most of the leading computer systems vendors to court the VARs, particularly as a way of selling lower-priced hardware that won't support a direct sales effort.

In sizing the turnkey systems/VAR market, INPUT subdivides the market into four principal submodes: equipment, packaged software, customized software, and services (education, training and professional services. Equipment is further subdivided into workstation/PCs, minicomputers and mainframes. In addition, fifteen industry-specific sectors are sized as well as seven cross-industry sectors. See Exhibit III-1.

EXHIBIT III-1

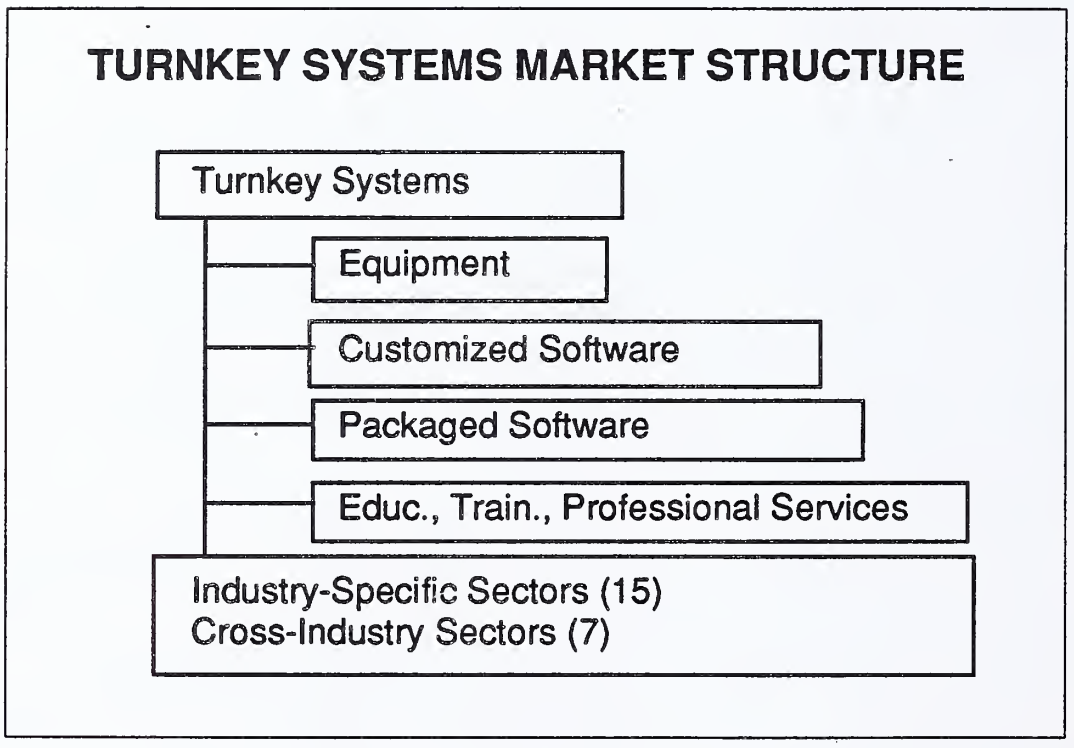
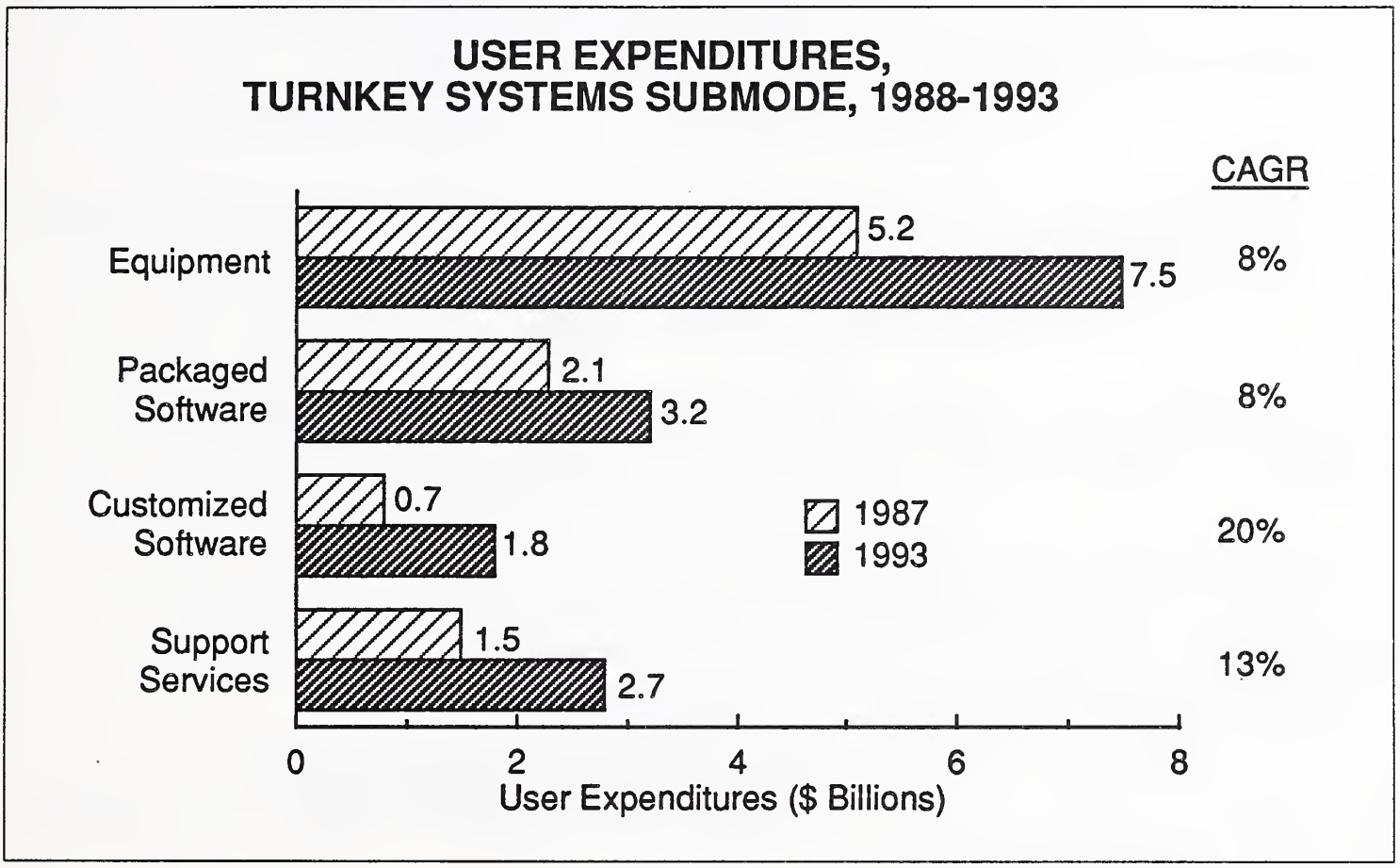


Exhibit III-2 indicates market size and growth rates for the turnkey system submode.

Equipment, while remaining the largest submode, will grow at a CAGR of only 8%. This slow growth is due to the significant switch from minicomputers to lower-priced PC- and workstation-based systems.

Packaged software has been the primary method of providing turnkey solutions, but will grow at only 8%. The more-rapid 20% growth rate in customized software reflects users' growing sophistication in demanding solutions tailored to their specific requirements.

EXHIBIT III-2



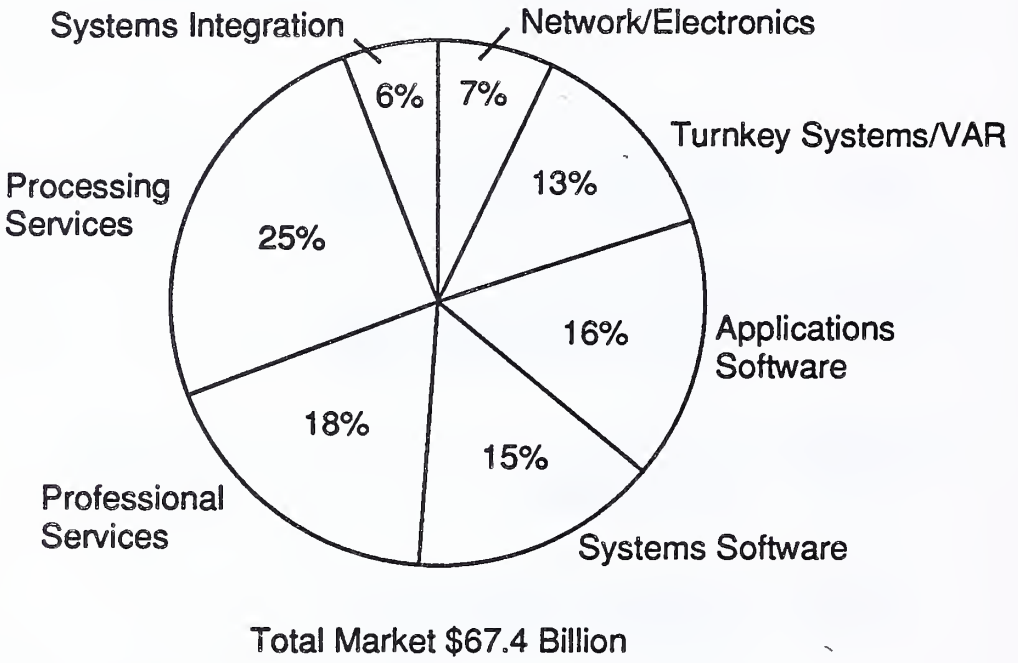
The 13% growth rate in support services includes consulting, education and training, and software support and maintenance not specifically included in the systems purchase price.

The turnkey systems/VAR market as shown in Exhibit III-3, represented approximately 13% of the total information services market in 1987. This is expected to decline to 9% of the total information services market in 1993, reflecting in part the encroachment on the turnkey valued-added, total solutions market by systems integrators and network services providers. INPUT is forecasting a compound annual growth rate of 17% for the total information services market between 1988 and 1993. The turnkey systems/VAR market is projected to represent the slowest growing sector.

Another factor negatively affecting the turnkey/VAR channels is that of market saturation in the smaller, niche, vertical markets. To expand the potential market opportunities often requires significant capital resources to develop new products and expand beyond a local geographic market focus. Many of the smaller VARs have seen profit margins squeezed in recent years and thus are not generating the funds necessary to continue to upgrade products and expand their geographic coverage.

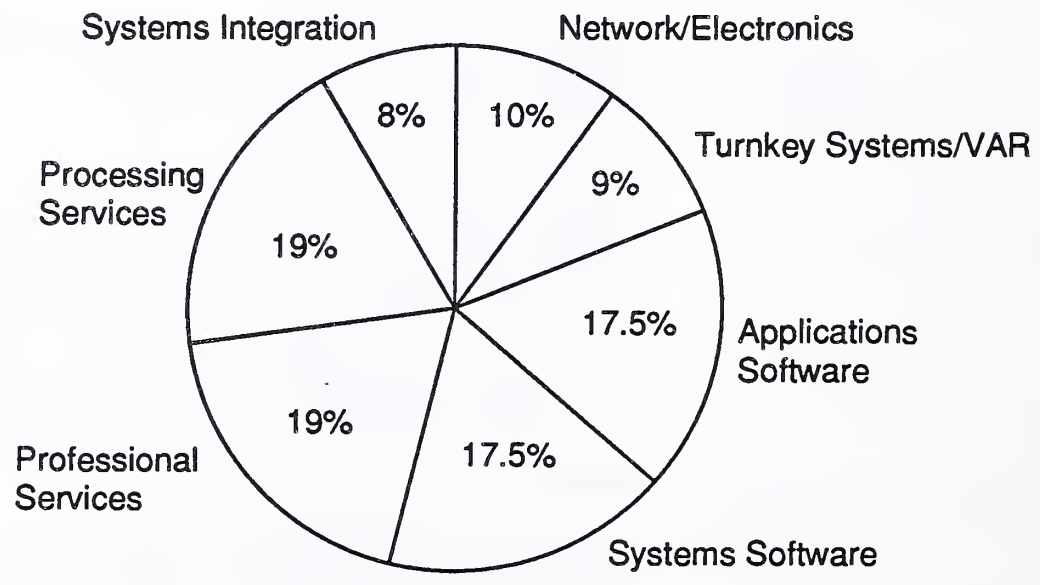
EXHIBIT III-3

INFORMATION SERVICES MARKETS BY MODE OF SERVICE—1987



Total Market $67.4 Billion

INFORMATION SERVICES MARKETS BY MODE OF SERVICE—1993



Total Market $174.0 Billion

This suggests that for many turnkey systems/VAR suppliers, some fundamental changes in product and marketing strategies will be required. Overall, the competitive environment has become much more challenging, with relatively modest profit margins for most participants.

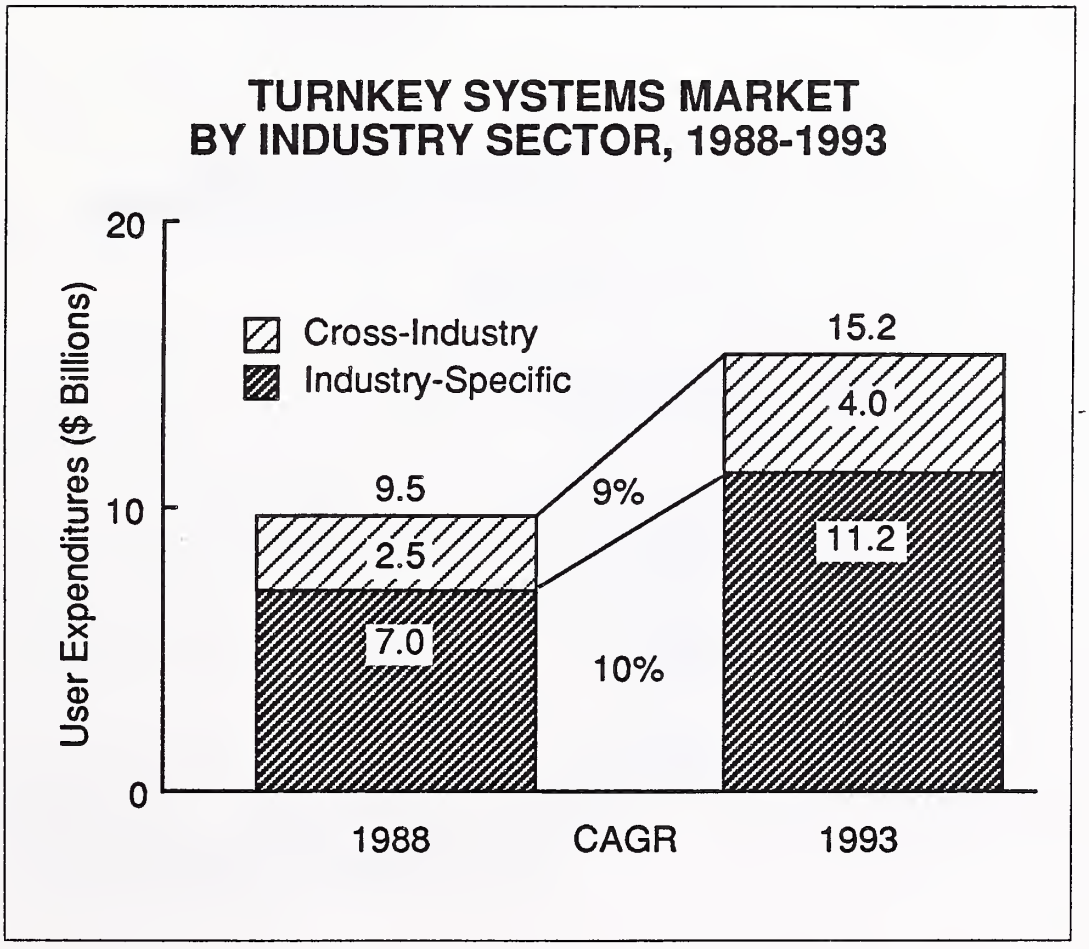
2. Industry-Specific versus Cross-Industry

The primary targeted market of turnkey systems/VAR suppliers is one or more industry-specific markets, and usually specific niche segments within such markets. Examples include hospital management, physicians' group practices and insurance agency systems.

The turnkey systems/VAR industry-specific market in 1987 totalled $6.2 billion. This represented 73% of total turnkey systems/VAR user expenditures. The cross-industry sector of the turnkey systems/VAR market totaled $2.3 billion in 1987.

As indicated in Exhibit III-4, INPUT projects that the industry-specific solutions will continue to represent the largest portion of turnkey systems/VAR sales over the next five years, estimated at $7 billion, or 74% of the total turnkey systems/VAR market in 1988 and $11.2 billion in 1993, also representing approximately 74% of the total market turnkey systems/VAR market.

EXHIBIT III-4



In both market segments, however, the fastest-growing segments are in customized software and professional services, including consulting, education and training, and maintenance.

For specific market size figures on the various industry-specific and cross-industry market sectors, see Appendix B in this report.

a. Industry-Specific Segmentation

Industry-specific turnkey applications markets are shown in Exhibits III-5 and 5(A). The largest application/industry segment is in discrete manufacturing, based on computer-integrated manufacturing (CIM) applications strength, as the factory floor becomes automated. The second-largest industry segment is in the banking and finance area where cash management, trust accounting, and portfolio management systems have had considerable appeal. The third-largest segment is medical, where hospital accounting systems, lab management systems, and doctor/dentist office systems have been important application growth areas.

EXHIBIT III-5

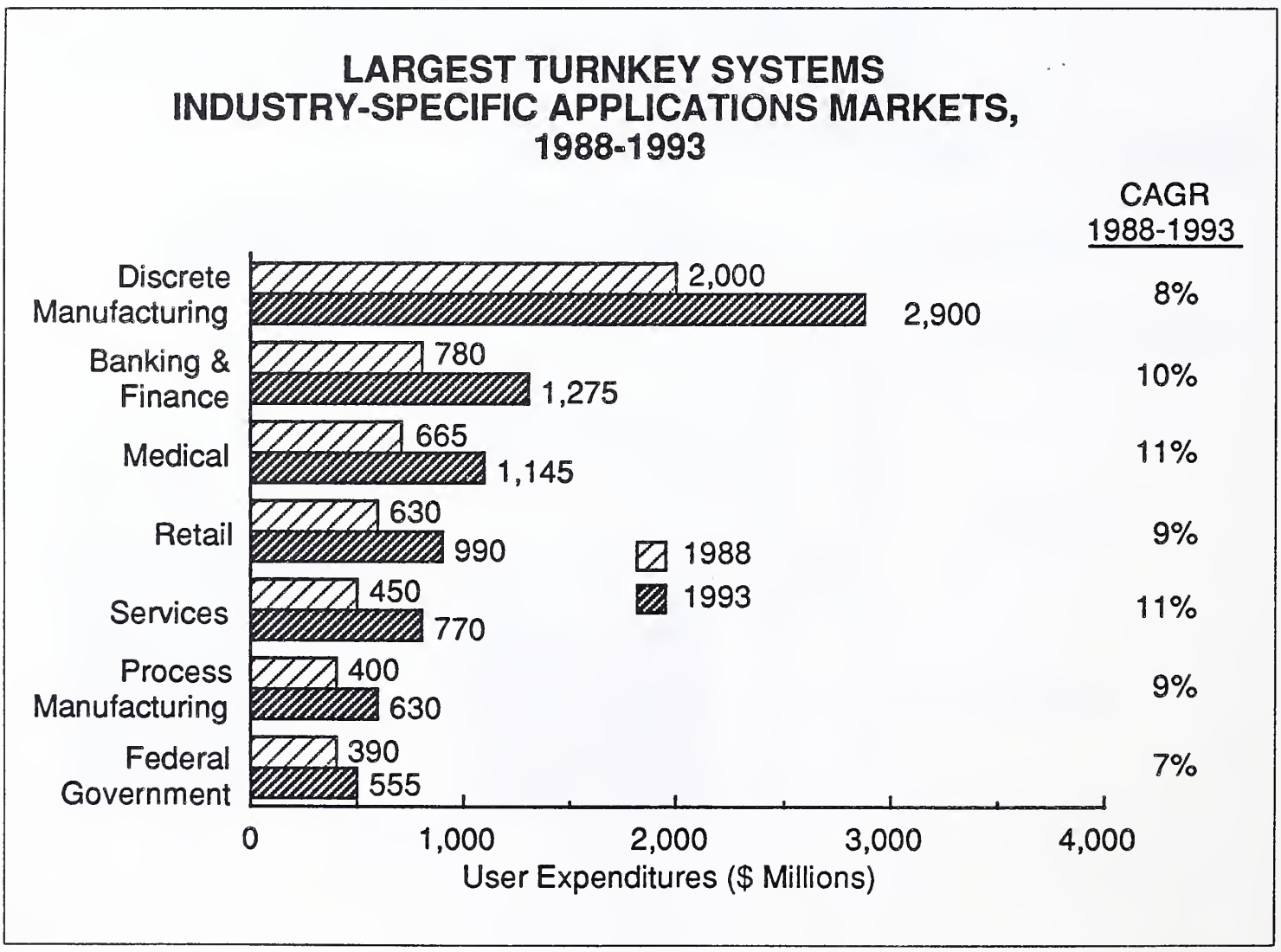
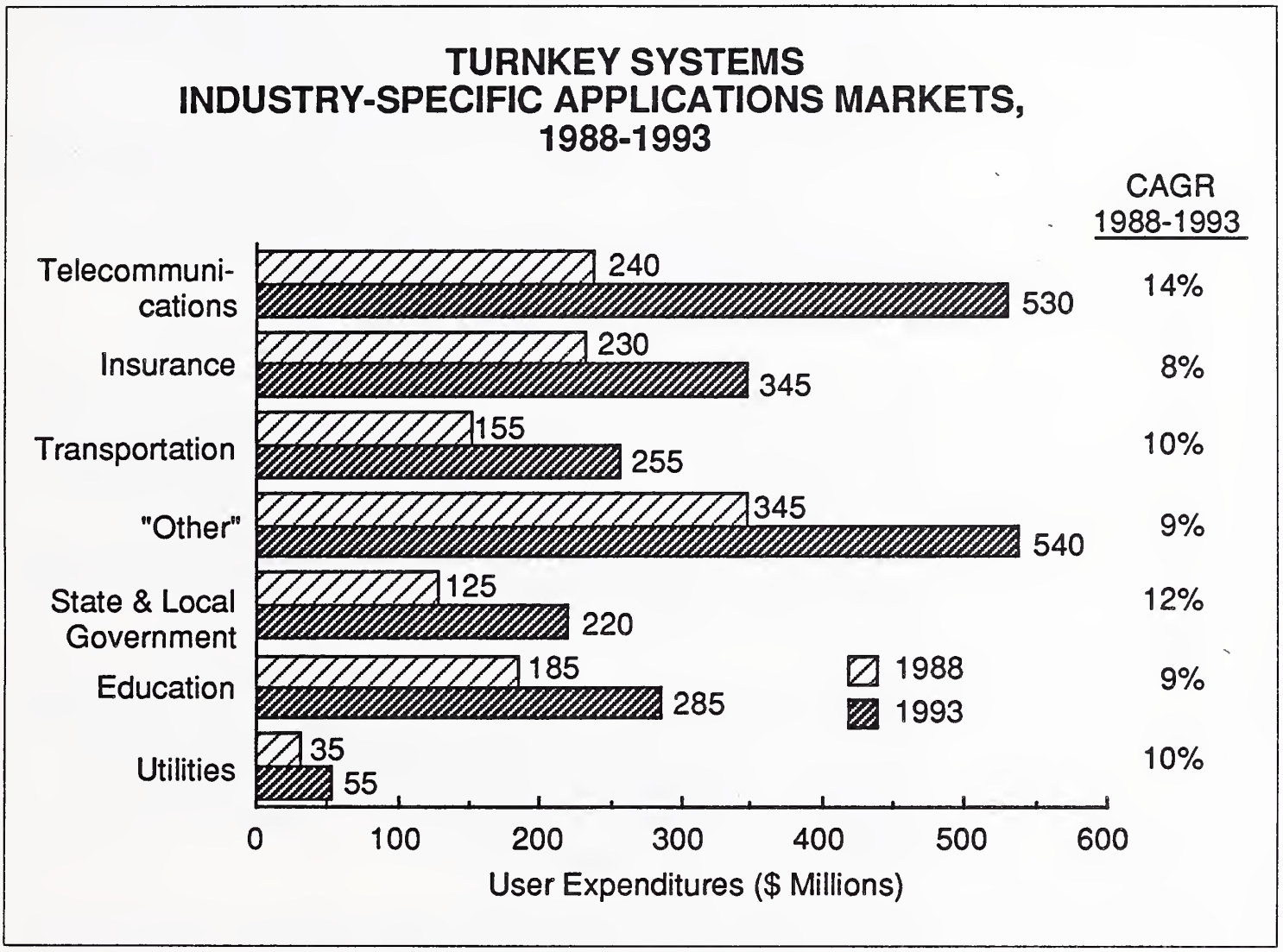


EXHIBIT III-5(A)



The strongest rate over the next five years in the industry-specific turnkey systems/VAR market is projected to be in the telecommunications area, with a 14% CAGR. An emerging telecommunications turnkey systems growth market is voice processing. This growth reflects, in particular, the potential for marketing products to the RBOCs.

Industry-specific revenues are generally growing at a faster rate than cross-industry revenues due to the emergence of the VAR distribution approach and the inherent need for specific applications that are integral to the user's business requirement.

The opportunity to sell industry-specific applications results from the lack of available internal resources to implement specific solutions at many small- to mid-sized companies. Because of the lack of applications backlog typically found in a large corporation, there is little justification to engage an IS department.

The turnkey vendor or VAR can, in effect, become the technical expert and the information services department for the application or system solution offered. Such a computer system sale is based on an application's fit, form, and function as well as service and training.

Turnkey systems, as sold through a VAR distribution channel, are also an effective sales and marketing channel for many computer manufacturers. However, the managing of this channel and the deployment of a computer manufacturer's direct marketing/sales organization can produce channel conflict and market cannibalization.

b. Cross-Industry Segmentation

The cross-industry markets include: accounting, education and training, engineering and scientific, human resources, office systems, planning and analysis, and other cross-industry specific markets (including corporate publishing and cross-industry distribution/sales support products).

Although most cross-industry segments are growing at a slower rate than vertical markets, strong office systems and engineering/scientific markets are pulling this market.

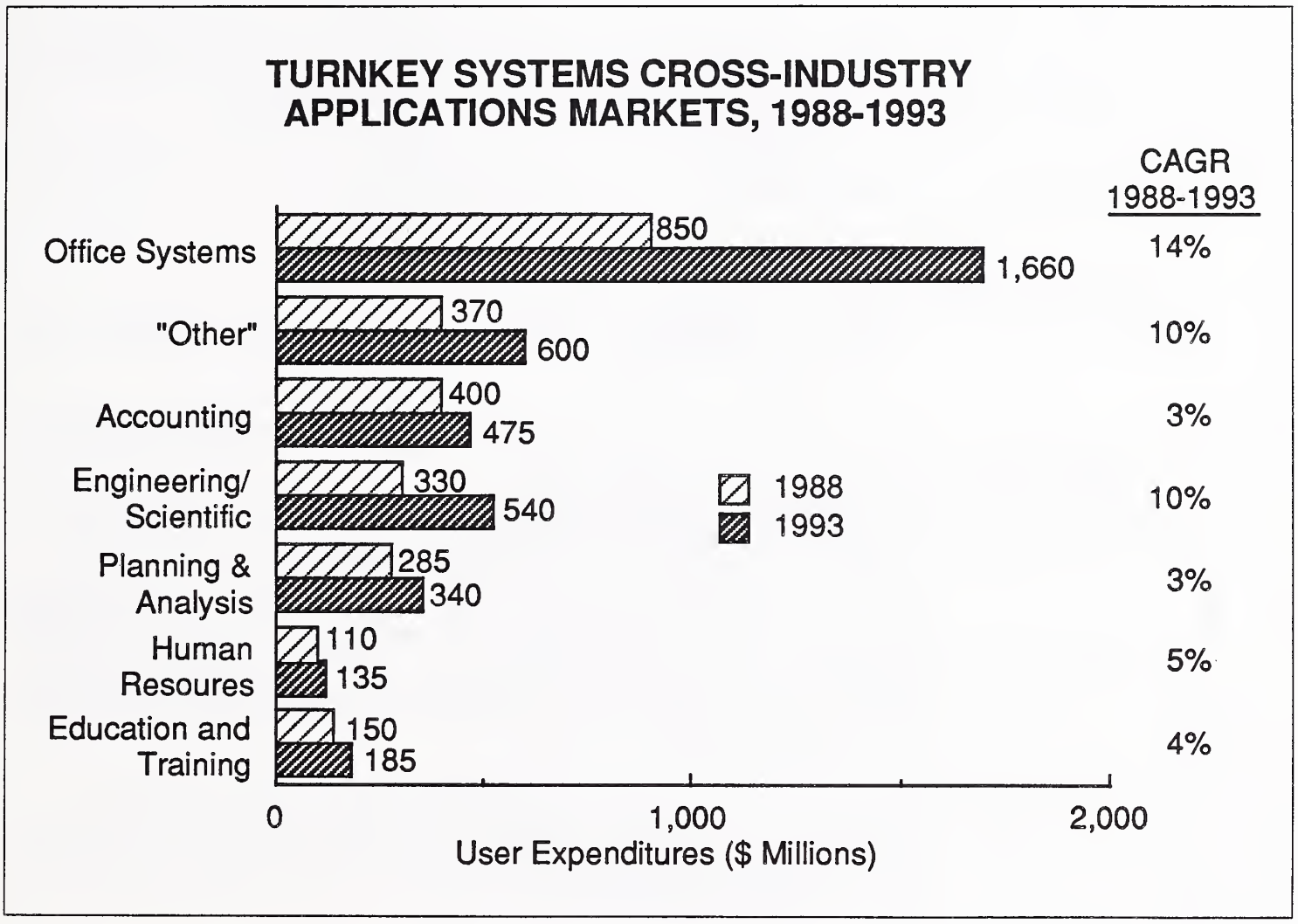
Much of the recent historical growth in the office systems market came from the word processing systems market; however, this market is now maturing. Turnkey systems vendors such as NBI, CPT, and Lanier (Harris) are seeing their business base soften and their functionality replaced by the desktop publishing vendors such as Ventura, Interleaf, Penta, Xyvision, and Texet.

The rest of the cross-industry segments are growing at average annual growth rates ranging from 3 to 4%—these cross-industry applications are reasonably mature and sold.

Exhibit III-6 provides a breakout by particular segments of INPUT's projections for the cross-industry market sector.

INPUT believes that cross-industry applications will be increasingly bundled with industry-specific market solutions. Turnkey systems/VAR suppliers will seek additional software products to increase revenues by providing additional applications that can be marketed to a new and existing customer base. This is being addressed by the process of cross matching, where turnkey systems/VARs resell cross-industry and other complementary products that are developed by other VARs and/or independent software developers. Some cross matching also involves the reselling of new application software that complements existing industry-specific (vertical market) solutions. The latter could include an expansion of health-care applications for hospital-patient billing to inventory and fixed-asset management systems.

EXHIBIT III-6



3. Custom versus Packaged Turnkey Applications

The custom turnkey solution meets basic user needs in the application system being offered, but also includes some special additions, modifications, and enhancements necessary to precisely meet the client's requirements.

This may seem somewhat contrary to the definition of a turnkey system, which suggests that an exact match is already available. But by using a customized approach, the vendor can extract a higher price for meeting the user's exact requirements. The trade-offs, of course, are the extra effort required to have the application finished so as to get final payment, maintenance and support due to the nonstandard part of the application, and the slowing effect in the propagation of the application system.

B

Market Structure

The turnkey systems/VAR market today consists of:

- The larger traditional turnkey systems suppliers such as Intergraph, HBO & Co., Reynolds & Reynolds, Compugraphics, C3, Inc., ASK Computer Systems, ISC Systems, and Daisy Systems
- The multimarket turnkey systems products of Control Data and Triad Systems
- The larger distributors/master VARs
- Small- to medium-sized VARs, the majority of which represent revenue of under $1 million
- Value-added retailers (computer stores) computer systems vendors

In addition, the market is increasingly attracting professional services vendors and systems integrators pursuing the turnkey, value-added system solutions market. The more recent entrance into the turnkey systems market by the computer systems vendors, value-added retailers, professional services vendors and systems integrators has greatly heightened the level of competition and has contributed to the narrow profit margins in the reseller markets compared with other information services distribution channels.

There are several well-defined applications (e.g. CAD/CAM/CAE, automobile dealer systems, hospital accounting systems, etc.) that have been successful, and have allowed several turnkey systems vendors to grow to significant size.

Exhibit III-7 lists some of the most-successful applications areas for turnkey systems/VARs in recent years.

The top 12 turnkey systems vendors, based on 1987 revenues, account for 35% of the industry total, as indicated in Exhibit III-8. The ability to seize market niches and grow with them has enabled these vendors to develop strong positions.

Detailed descriptions of some of the leading turnkey systems vendors are found in Chapter V.

VARs have become an important part of the distribution channel strategy of most emerging companies. VARs are an alternative to the direct sales force approach, have easier access and less overhead in selling in geographical areas or in specialized application niches, and have been very effective in moving products in the minicomputer and microcomputer markets. However, in general, smaller VARs are not effective in selling large and/or expensive turnkey application systems. End users with large systems requirements are generally more comfortable dealing directly with the hardware vendor.

Small-to medium-sized VARs tend to have a local or regional focus, although many such dealers are now extending their marketing reach through the use of agents and brokers.

EXHIBIT III-7

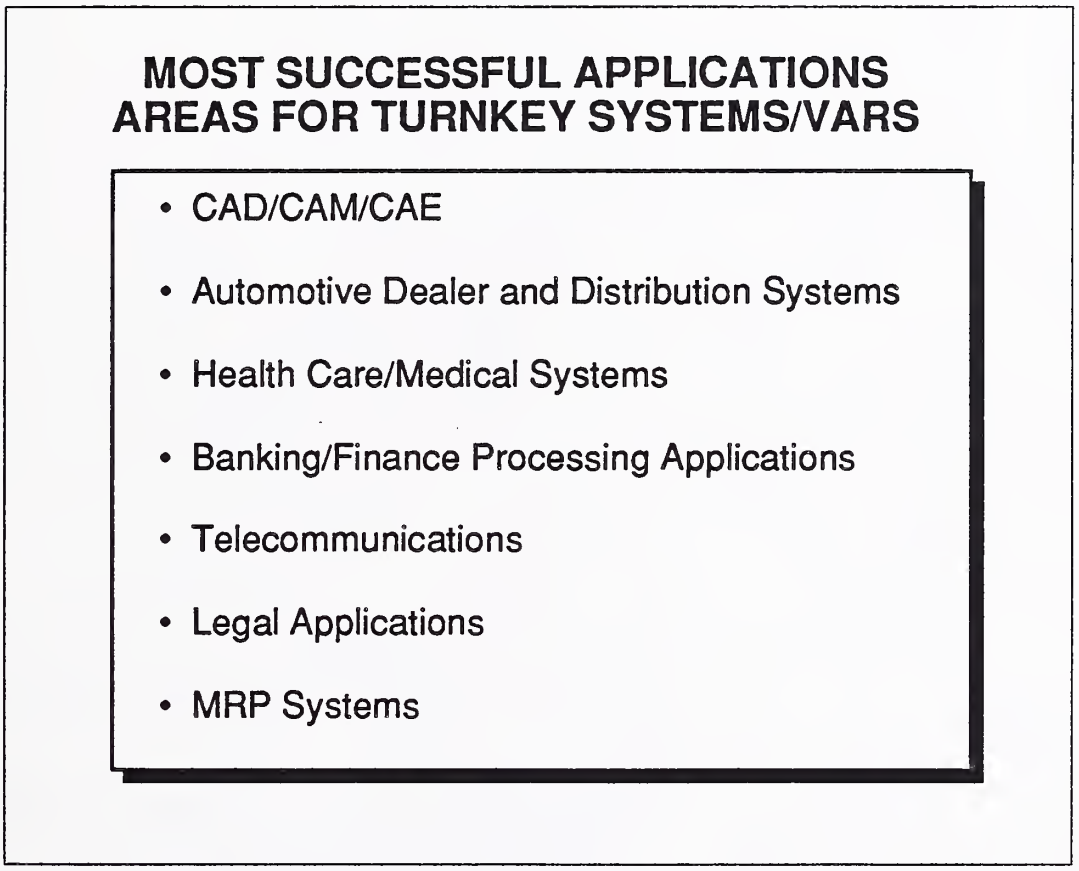
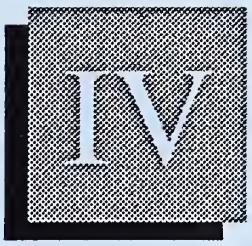


EXHIBIT III-8

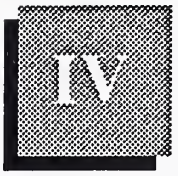
LEADING TURNKEY SYSTEMS VENDORS, U.S. REVENUES, 1987

Company Name	1987 Revenue ($M)	Market Share (%)**
Intergraph	628	7
Prime (& Computervision & Calma)	500 *	6
Schlumberger (Applicon & MDSI)	467 *	5
McDonnell Douglas	224 *	3
Compugraphic	220	3
ADP	195 *	2
Mentor Graphics	148 *	2
ISC Systems	146	2
Reynolds & Reynolds	138	2
Bolt, Beranek, Newman	136	2
Convergent Systems	130	1
Evans & Sutherland	121	1
Subtotal	3,053	36
All Other Vendors	5,607	65
Total Market	8,660	100

* INPUT Estimate
** Rounding Adjustments = 1%



Issues and Trends



Issues and Trends

A Summary

This industry is characterized by a few large, well-capitalized companies, as well as a large number of companies with revenues of less than $1 (with relatively limited capital resources) addressing primarily industry-specific, niche markets. As a result, a pronounced pattern of revenue and profitability cycles has developed.

Many of the turnkey systems/VAR suppliers have gone through a number of strategic product and marketing shifts, dictated by such factors as market saturation in many of the niche markets, declining profitability with the increasing use of standard hardware and the resultant commodity pricing pressures, and increasing competitive pressures from hardware vendors.

The more recent successful strategies have involved several of the following elements:

- Movement away from selling proprietary hardware, with the value-added component coming more from proprietary software and support services
- Unbundling of hardware and software by turnkey systems/VARs with a change toward the use of standard hardware platforms
- Use of cross matching by turnkey systems/VARs for additional software products—involving vendor sources such as other VARs and third-party software developers
- Greater emphasis on expanding the breadth of offerings to a particular industry-specific market, with increased emphasis on internal software development
- Greater stress on support services, with some turnkey systems/VARs becoming the MIS manager for their end user customer—including on-site facilities management

- Increasing use of vendors' partners to help provide necessary support services to maintain account control, including training, cooperative advertising, and maintenance

- The development of strategic alliances between industry-specific software turnkey systems/VARs and hardware manufacturers pursuing turnkey solutions in industry-specific market channels

B

Trends and Issues

1. Channel Conflict

The increasing presence of hardware and software company distributors, agent/brokers, and computer retailers in the turnkey systems/VAR marketing channel has made channel conflict a principal issue for independent turnkey systems/VARs. To reduce this conflict, a restructuring of many vendor/VAR programs has been attempted to maximize the benefits of utilizing third-party sales channels. Particular strategies involve the compensation of the direct sales account managers for leads to value-added resellers in their account territories, and, more recently, the implementation of joint customer calls by the VAR and the vendor's direct sales force.

One approach for dealing with the distributor/VAR channel conflict is to work in a partnership relationship, particularly for larger accounts.

Previous restrictions on storefront computer dealers becoming value-added resellers also are now being lifted by many computer vendors, which makes such dealers more formidable competitors to the traditional VARs. Such retailers often have a wider range of products and can provide more competitive pricing that the traditional VARs. For example, MicroAge, Inc. recently announced that it was repositioning seven company-owned stores to stress value-added sales as an alternative to high-volume, low-margin sales.

As such, many VARs are seeking additional vendor relationships to broaden product offerings to minimize such a competitive advantage.

2. Master VARs (Two-Tier Distribution)

The use of master VARs (two-tier distribution) to service the smaller-volume reseller is on the rise by computer and software vendors.

An advantage for the smaller VAR is the ability to get better discounts from the master VAR than from the vendor. Also, a master VAR can offer smaller VARs its manufacturing, distribution, and other vertical market-oriented software packages. In addition, a master VAR can make available its internal consulting team to advise VARs on connectivity and other product issues.

A disadvantage to the smaller VAR is master VAR/distributor's ability to address the VAR market directly with lower prices. In turn, various restrictions have been placed on master VAR/distributors by many vendors that require distributors to provide a value-added product dimension.

Vendors benefit from the use of master VARs because the distributor shares the cost of inventory and also improves the efficiency of the vendor's production scheduling. This arrangement also gives the vendor immediate access to the presumed distributors' broad base of customers much more cheaply than through other distribution approaches.

Distributors that are becoming master VARs today include traditional equipment distributors, leading software distributors, larger VARs, and, more recently, distributors of electronic components.

3. Cross Matching

Cross matching by turnkey systems/VARs involves the broadening of their software and hardware product offerings by initiating a number of software and hardware supplier relationships. These relationships can include third-party application developers, other VARs, applications and systems software houses, and peripherals manufacturers.

The principal benefits include the ability to leverage the customer base, increase the size of the initial systems sale, and expand the potential addressable market.

More popular product extensions include enhanced applications-specific products, office systems applications, spreadsheets, financial and other cross-industry applications, RDBMS and related utility software, and disk drives. The acquisition of additional vertical market applications software, in particular, allows the VAR to extend market and product knowledge to related markets—i.e., such as expanding from hospital management to clinical applications as well as the network integration of such product offerings—that can significantly expand the potential size for the VAR's targeted industry-specific market. Also, the bundling of services can justify increasing sales prices for consulting and systems integration services.

The use of RDBMS as a software development platform by the VAR also allows for the development of integrated software offerings, which can provide a broad range of functionality, particularly for the smaller business market. The use of RDBMS for product development also can increase file integrity and transaction security.

A principal benefit to systems and applications software companies is their ability to reach local and/or small business markets that cannot be cost effectively addressed by a direct-sales force.

Cross matching can also involve the porting of the VAR's software to a number of different hardware platforms, or acquiring software from independent developers whose software runs on a variety of different operating systems and hardware. At times, this procedure also involves selling only software to the end user and allowing the end user to make the hardware decision independent of the VAR.

4. Turnkey Systems/VAR Product and Service Extensions

In order to increase revenue and profits and to provide a base of recurring revenue, many VARs are concentrating on providing add-on products and more services to the installed customer base. This strategy also helps increase customer loyalty and prevents competitive encroachment from computer systems vendors and computer retailers/dealers, many of whom are also expanding service offerings to include consulting, education and training, maintenance, and network integration. Repeat business also generally brings higher margins due to the reduced marketing expense.

Currently, much of the post-sale support for VARs is provided by the vendors. Hardware maintenance should probably be left to the hardware vendor or to a third-party maintenance provider due to the high cost of carrying inventory for maintenance purposes. Thus, emphasis should be more on software maintenance, which can include education and training, integration, product upgrades, implementation, and MIS services. For the larger VARs, a customer-leasing program also could be considered.

An attendant issue, however, is proper pricing of the support services. The margin of profitability obtained from providing such services should be compared with any commissions made from selling vendor support programs. The use of third-party maintenance services also should be considered, which helps to minimize channel conflict related to vendor-provided support services.

Increased marketing focus is also being placed on the installed customer base and to reducing marketing costs. Along with this, increased emphasis on providing a variety of peripherals, not only at the initial sale but with a particular new focus on add-ons and product upgrades, is occurring.

5. Standards

The emerging standards environment for software, networking (TCP/IP and OSI), and peripherals connectivity (SCSI), will allow the turnkey systems/VAR to provide a much more-complex turnkey solution at a much-lower cost of assemblage.

Also, increasing emphasis on standard hardware and software should allow the VAR to put more emphasis on services and customization and thereby increased the perceived value-added portion of the sale by the end user.

Other emerging standards that should expand the potential market opportunities for VARs include those surrounding UNIX, a software operating system underutilized in the current VAR market. The adoption of the UNIX graphics-based operating systems interface, POSIX (the federal government-based interface specification for UNIX systems), will create an environment where a VAR-developed UNIX application can be more easily migrated from a desktop to a mainframe computer as well as among multiple-vendor hardware platforms. Standard user interfaces, such as the X Windows System Version 11, Open Look from AT&T (also based on X Windows) or one that emerges from the OSF consortium of many of the leading UNIX systems vendors, will also improve the often criticized user-interface qualities of UNIX.

The federal government's mandate for the use of OSI protocols within a two- to five-year implementation timetable as specified in the National Bureau of Standard's Government Open Systems Interconnect Profile (GOSIP) report, has been a major factor fostering recent OSI implementation strategies by the major computer systems vendors. This will also require the implementation of transition programs between the current de facto TCP/IP-based internetwork protocols and OSI.

Overall, the network connectivity market will continue to provide major opportunities for turnkey systems/VARs of all sizes over the next several years. [Industry studies suggest that 80 to 90% of the PC installed based is still not connected by local area networks (LANs). Programs for providing PC-to-Macintosh translation, as well as other types of multivendor file interchange (there are several) and well-established file format standards, should also provide significant market potential for VARs working with network integration programs.] A principal source of competition for VARs in local markets is electrical contractors.

In addition, with the passage of the Computer Security Act of 1987, network security has become a major concern for potential LAN customers. The new law makes the provider of the network service responsible for a customer's loss. This provides a potential significant market opportunity for security encryption software and hardware.

6. Strategic Alliances

Several of the leading computer systems vendors have recently introduced a number of programs that provide more direct vendor sponsorship of a VAR's product. These include such arrangements as joint marketing or joint sales calls and product references, as well as incorporation of the

VAR's or software developer's product in the computer system vendor's own turnkey solution.

For example, IBM has recently introduced the Industry Remarketer Program for VARs, which allows IBM sales reps and IBM remarketers in selected industry application areas participate in joint sales calls. The program also allows the remarketer to participate in IBM seminars and business shows and to use IBM Product Centers for demonstrations. IBM's strategic alliance program involving independent software developers/VARs also includes its Application Software Division third-party software recruitment program.

IBM's new Application Software Division could become a major competitor to independent turnkey systems/VARs in several of the industry-specific markets. However, it is also possible that IBM could become a major acquirer of independent industry-specific software companies.

Digital Equipment Corporation (DEC) has a new Systems Cooperative Marketing Program (SCMP). Under this program, DEC recently signed an agreement with Nynex Corporation's DATA Group to cooperatively market DATA Group's customer and field service management systems.

Sun Microsystems, Inc. has recently concluded several marketing agreements with business applications software vendors as part of Sun's strategic move into the corporate business environment. Selected agreements include those with SAS Institute, Inc., American Airlines, the Santa Cruz Operation, Inc., and WordPerfect to supply business applications software for Sun-3 and Sun-4 workstations. Sun apparently plans to include the SAS system applications software in Sun's Catalyst Advantage program for selected third-party vendors. The Santa Cruz software agreement calls for its spreadsheet program, SCO Professional, to be offered for the Sun-3; WordPerfect 4.2 word-processing software will be made available for single-user Sun-3 workstations; and American Airlines' travel and entertainment expense management system, Capture, is being made available to Sun-3 and Sun-4 workstation users.

Sun's third-party software agreements are also indicative of the increasing move on the part of the leading computer systems vendors to provide more inclusive, turnkey-type solutions rather than only hardware platforms. Sun also has joint marketing agreements for hardware products with AT&T, Cray Research, Alliant Computer Systems, Stratus Computer, Quotron, and Reuters, among others.

Apollo also has recently announced a partners program for strengthening ties with OEMs, VARs, and third-party software suppliers. Approximately 40 to 50 third-party companies that provide software for particular vertical markets targeted by Apollo will be designated as principal partners. The latter will involve joint marketing and sales planning with

Apollo's sales staff. Targeted markets in the principal partners' program include, in particular, electronic design automation, computer-aided software engineering, mechanical CAD, financial services, artificial intelligence, and electronic publishing.

Applix, Inc., a leading supplier of the Alis® integrated office-automation systems to the VAR market, recently signed a joint marketing agreement with Oracle Corp. that provides Oracle's relational database management system support for Applix's Alis® office automation software. The joint marketing agreement includes joint promotions and customer referrals.

Another type of strategic alliance relationship is developing between retailers and VARs under these relationships the VAR can, for example, provide a network integration value-added program.

7. Cooperation between VARs and Consultants

The Big Eight auditing firms, in particular, are establishing product and services relationships with established VARs that can greatly increase the VAR's marketing potential.

For many years, the Big Eight firms have been consultants on information technology, but more recently companies like Arthur Andersen also have become major factors in providing systems integration turnkey solutions. By informing Big Eight companies of their products and services through educational outreach programs, VARs can become a part of the product base Big Eight firms use in implementing turnkey-type solutions.

The type of relationship the various Big Eight firms have with VARs varies. Coopers and Lybrand, for example, recently signed a joint marketing agreement on a voice-response system for access to employee benefits and other job-related information, with Computer Integration Associates, Inc., an AT&T master VAR.

Price Waterhouse & Co. has a product approval program for VARs with vertical market software that does not include product recommendation, but client implementation support.

Hewlett-Packard (HP) has recently established a program called the Solutions Partners Program, which will attempt to coordinate sales between its smaller VARs and major consultants that would not normally work with the smaller VARs. The three-way coordinated sales model includes hardware, systems software and networking from HP, services such as project management, systems integration, implementation and training from the consultant, and software from the VAR.

8. Workstation Platforms

The highest growth potential in the equipment platform portion of the turnkey systems/VAR market is expected to be in the workstation/PC area. INPUT is predicting a 30% CAGR in workstation/PC hardware platforms over the next five years, compared to 6 to 8% for minicomputers and 3% for mainframes. This would suggest that turnkey systems/VARs look to the workstation market for porting current and future software solutions.

There is also increasing interest on the part of technical workstation vendors in pursuing the office systems and manufacturing VAR markets, which are among the largest and fastest-growing markets for turnkey systems solutions. Workstation vendors are seeking, in particular, to sell the low-end of their product line through the VAR channel, partly because lower-priced systems can be more profitably sold through these third-party channels.

The office systems/desktop publishing segment, which is projected to be one of the higher growth segments in the turnkey systems environment over the next several years, should continue to be a strong market for workstation/PC solutions. Other markets that will also show strong growth are the telecommunications, medical, and state and local government segments.

9. Grey Market Competition

Many universities and colleges have volume purchase arrangements with PC vendors such as Apple, IBM, and Zenith, which, when combined with the schools' tax-exempt status, can create a cost structure that allows a university to undersell VARs. A few universities apparently do not limit sales to qualified students and staff, but also provide low-priced deals to the more-general small-business computer community, the so-called grey market.

Another grey market exists between distributors and unauthorized VAR dealers where dumping of excess inventories undermines the pricing policies of the hardware vendor for its different marketing channels. Many VARs that sell grey market products are too small to qualify for authorized VAR status.

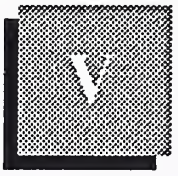
A corrective measure taken by some computer systems vendors includes the use of authorization numbers. Distributors must use such numbers when dealing with authorized VARs to specify products sold through a two-tier distribution structure.

10. Agents/Brokers

In order to expand marketing coverage beyond what a VAR's financial resources can support, many small- to medium-sized VARs are beginning to use agent/brokers to expand their geographic market coverage. The agent is usually employed in two ways. The agent can act as an extension of the VAR's sales force, often working with the sales and support people of the vendor, to initiate the sale to the end user—but not take take title to the computer system. Second, the agent can provide some enhancement to the VAR's existing product line.

A particular issue related to a VAR's utilization of agents is the confusion to vendors in terms of channel conflicts between VARs and agents. Confusion also exists as to where the responsibility lies for product support.

Competitive Environment



Competitive Environment

A Successful Vendor Strategies

A number of industry studies have been done on what turnkey systems/VARs consider as important attributes of a desirable vendor.

VARBUSINESS Magazine, for example, has an annual Report Card Review, which tracks 12 of the larger computer systems vendors with VAR distribution programs. With the exception of Altos, however, all the other companies tracked by the *VARBUSINESS* survey are primarily minicomputer and mainframe computer systems companies.

Valuation criteria in this survey included such characteristics as breadth of product line, quality of products, availability of products, price/performance satisfaction, satisfaction with profit margins, promptness of order processing; whether delivery schedules were met, VAR support services, satisfaction with charges for support, provision for hardware maintenance, quality of information provided, willingness and ability to address VAR problems, commitment to VAR program, and interest in avoiding cross-channel conflict.

There are many other types of turnkey systems/VAR vendors. The types of turnkey systems/VAR vendors are now expanding far beyond beyond minicomputer and mainframe systems vendors to include a number of systems and applications software companies, microcomputer vendors, and peripherals suppliers.

Some of the more successful vendor programs observed by INPUT include:

- Autodesk, in PC/workstation CAD software
- Seagate Technology, in small format Winchester disk drives
- Quadratron Systems, with its UNIX-based, integrated office-automation technology

- Ultimate, which is also a VAR, with its PICK-OS-based computer systems
- Informix, a leading UNIX RDBS vendor, with integrated UNIX-based office systems software, and extensive 4G application development tools
- Oracle—a leading supplier of RDBS for the minicomputer, mainframe, and microcomputer markets—with support for a broad range of hardware platforms and operating systems
- Compaq Computer, a leading supplier of high-performance IBM-compatible desktop computers
- Apollo Computer, with its Open Dialogue object-oriented software toolkit (based on the X Windows design) for developing customer user interfaces that can run on a variety of Unix hardware platforms
- Apple, with the open-architecture MacII
- Sun Microsystems, with the new Sun 386i machine which runs both UNIX and DOS operating systems
- Timberlane Software Corporation, with its broad applications software offerings for construction and property management

Characteristics of successful turnkey systems/VAR vendors are included in Exhibit V-1.

B

Successful Turnkey Systems/VAR Strategies

INPUT's index of 23 public turnkey systems/VAR suppliers, which includes companies with a range in 1987 calendar revenues from $3.2 million to $641 million, showed a 15% annual revenue expansion, with annual net income increasing 74%. Revenue growth for these companies in 1986 was 10% and 7% in 1985. The annual rate of change in net income has been more erratic. Earnings for the group fell 96% in 1985, jumped 376% in 1986, and grew 74% in 1987. The profitability for the turnkey systems group in 1987 was 6%.

The leading performers in both revenue and earnings gains in 1987 among the public companies tracked by INPUT are included in Exhibit V-2. This index includes only companies that represent pure plays in the turnkey systems/VAR market.

EXHIBIT V-1

SUCCESSFUL TURNKEY SYSTEMS/VAR PRODUCT/SERVICES STRATEGIES

- High Quality, Reliable Product
- Product Availability
- Broad Product Offering for Targeted Industry, Including a Network-Based Computer Offering
- Responsive Maintenance Program
- Educational/Training Support
- Cooperative Advertising Program
- Minimal Direct Sales, Third-Party Channel Conflict
- Use of Standard Interfaces, Platforms, and Operating Systems
- Product Migration Path
- Available Inventory/Receivables Financing
- Timely Awareness and Implementation of New Product Information

EXHIBIT V-2

GROWTH LEADERS: PUBLIC TURNKEY SYSTEMS COMPANIES—1987 (CALENDAR)

Company Name	1987 Total Revenues ($ Millions)	86-87 Revenue Growth (Percent)
Cerner	34	94
Interleaf	52	62
C3	109	49
Comptek Research	44	36
ASK Computer	116	35
Reynolds & Reynolds	572	26
HBO & Co.	175	13
Auto-Tool Tech.	76	22
Barrister Info. Sys.	38	14
Shared Medical	391	6
National Computer	209	4

C

Turnkey Systems/ VAR Strategic Models

The following list of companies includes a limited sample of turnkey systems/VARs that have demonstrated a variety of successful product/ services strategies.

1. The Reynolds and Reynolds Company (Dayton, OH)

The Reynolds and Reynolds Company's principal turnkey system products are sold to the automotive dealership market, where it provides in-house minicomputer- and PC-based integrated applications software products based on hardware from NCR and Texas Instruments.

Applications include accounting, payroll, vehicle and parts inventory control and billing, service merchandizing, scheduling and billing, leasing, finance and insurance, and manufacturer communications. Products are also sold to automobile manufacturers, particularly for the company's

electronic information exchange program, Dealer Communications Systems, which automates the dealer/manufacturer ordering processing.

Revenue growth in its turnkey systems division—which principally includes its automotive dealership products as well as its hospital-based billing systems from its December 1986 acquisition of National Medical Computer Services—has continued to show strong growth in recent years, with revenues expanding 10% in the first nine months of fiscal 1988, compared with a compound annual growth rate in the computer systems division of 10% from 1983 to 1987. The Reynolds and Reynolds Company is the largest factor in the automotive dealership information services market, with ADP as the second largest. There are also a number of other, much-smaller turnkey competitors. Company revenues in fiscal 1987 totaled $573 million, with approximately 40% from the company's turnkey computer system division and the remaining 60% from its business forms division, which also sells products into the automotive dealership market.

A decline in corporate operating margins in fiscal 1987 and 1988 related primarily to acquisition and divestiture costs as the company restructured its product offerings in areas not related to core business lines.

However, development costs related to its new relational data base ERA (TM) computer systems product for the larger automotive dealership market also was a relatively significant factor contributing to the decline in profitability during the past two years. With the recent consolidation into the automotive dealership market and the trend to much larger, "mega-dealers," such a product was necessary to capture the growth trends in its market. However, it also indicates how turnkey systems vendors' operating results tend to be more volatile than in many other delivery modes, with the need to frequently expand product offerings when addressing a limited number of vertical markets.

Future strong market growth is expected to come from dealership upgrades to second- and third- generation computerized systems that emphasize integrated applications solutions.

The company has also historically also emphasized related professional services sales and recently substantially increased its investments in international operations.

2. Interleaf, Inc. (Cambridge, MA)

Interleaf, a leading factor in computer-aided publishing (CAP)—one of the most dynamic markets addressed by turnkey/VAR suppliers—recorded revenue growth of 57% in fiscal 1988, up from $37.2 million in fiscal 1987 to $58.4 million in fiscal 1988. In addition, in 1988 the company turned profitable for the first time since its founding in the early

1980s. The gross margin in fiscal 1988 on systems and software sales was 30%, and the operating margin was 13%.

Approximately 76% of fiscal 1988 revenue was derived from turnkey system sales, 12% from software license fees, and the remaining 11% was derived from maintenance services and other sources. Over the past two years, Interleaf's product mix been shifting toward a higher percentage of software license revenue, with the increase in unbundled hardware/software sales and the signing of a number of software licensing/ royalty agreements with major OEMs in 1986 and 1987.

Competitive strengths of the company's product line in the turnkey/VAR channel include a high level of software product integration, combining text processing and raster and vector format graphics; a major emphasis on corporatewide electronic publishing systems; color display capability on its new high-end version 4.0 of Interleaf's Technical Publishing System (TPS) and software support for most of the major hardware companies, including Apollo, Apple, DEC, IBM, and Sun Microsystems. With more recent support for IBM mainframe systems, PC XTs, ATs, and PS/2 products, corporatewide networking implementation can include the full range of processing capability with Interleaf's Corporate-Wide Document Management product.

Interleaf has also stressed a full-service capability, with service revenues increasing from $2.6 million in fiscal 1987 to $6.2 million in fiscal 1988, reflecting an annual growth rate of 142%. A more-recent service emphasis of the company is in systems integration.

Interleaf has also established a strong market share position in the federal government market. In March 1987, the company entered into an arrangement with ML Technology Ventures, LP for the funding of ongoing product development in the personal computer and international electronic publishing markets. Interleaf has also established strategic alliances with IBM for the sale by IBM of Interleaf's software on IBM's RT and PS/2 70 models.

Its principal competitors in the two areas of the CAP market are as follows:

- Technical documentation

  - Xyvision
  - Eastman Kodak Company
  - Frame Technology Corporation
  - Texet Corporation.

- Office publishing

  - Kodak
  - Xerox Corporation

3. Alliance Data (San Carlos, CA)

Alliance Data is a smaller, profitable, two-year old VAR, with an estimated revenue base in the $2 to $3 million range that provides a systems integration, custom programming program to small- and medium-sized companies. Its core product is a data base-oriented accounting system, written in Informix, which allows for the combining of various business systems applications, such as telemarketing and financial reporting. The company also provides local and wide area network integration, including vendor relationships with a number of the leading independent network companies such as 3Com, NEC, AT&T, Bridge, and Excelan. A particular networking emphasis is on Apple- and DOS-to-UNIX connections.

The company also provides premises management (MIS) services to smaller companies.

Alliance Data has sales offices in San Carlos, CA, and Chicago, and also has 22 sales agents that provide a national marketing presence.

4. Mentor Graphics (Beaverton, OR)

Mentor Graphics, with turnkey workstation-based systems, is the leading participant in this market. Some industry sources estimate it has 25% of the electronic design automation (EDA) systems market.

Following a shakeout in that market over the past several years, two broad-based competitors remain: Daisy Systems and Valid Logic. However, Mentor Graphics' growth rate in sales and profit margins also dominates the industry. Approximately 48% of the company's current sales are from the international market; Mentor also has dominant positions in the Japanese and European markets.

Key to Mentor Graphics' competitive success is its emphasis on software development versus the dual concentration emphasized early on by major competitors in proprietary hardware and software development.

In the most recent June quarter of fiscal 1988, revenue totaled $72.1 million, compared with $53.9 million in the year-earlier quarter, an increase of 34%. The gross margin was 54.8% compared to a gross margin of 50.8% in 1987 and 44.4% in 1986. Although systems pricing continues to decline—related to continuing reductions in hardware prices—systems sales include a much higher percentage of software content, where gross profit margins are close to 100%. Related to this,

the company has continued to broaden its software product offerings. Mentor has offered new products in back-end (CAD) printed circuit board layout tools, integrated design and testing programs. And, its purchase of Tektronix's CAE program has given it an initial thrust into the CASE market.

The market growth over the near term in CAE product is estimated by industry sources at 25%. However, with broadened product offerings, continued market share improvement, and a strong presence in the international markets, the company is maximizing opportunities in the EDA market.

5. Intergraph Corporation (Huntsville, AL)

Intergraph is a leading turnkey supplier of micro-, workstation- and minicomputer-based computer graphics applications that can provide for the automation of a broad base of a company's operations, such as 2-D and 3-D engineering and design (mechanical, electrical and electronic); drafting tools; computer-aided manufacturing (CAM); document design and technical documentation; factory management tools; and plant design tools.

Principal competitors are IBM and Prime/Computervision.

Revenue in the June quarter of fiscal 1988 totaled $203.5 million compared with $160.2 million in the comparable year-earlier quarter, an increase of 27%. Earnings per share at $0.41 in 1988 compared to $0.29 expanded at 41% quarterly rate.

Intergraph's turnkey systems revenue and earnings performance has shown a steady progression for the past several years, with the exception of 1986 and 1987. Those years showed some flattening, particularly in earnings performance, related primarily to the introduction of a new proprietary workstation hardware product line and new object-oriented application software.

The uniqueness in Intergraph's approach to turnkey systems marketing and to the computer-aided design/computer-aided manufacturing (CAD/CAM) interactive graphics systems markets is now concentrated on developing its own workstation hardware platforms. These platforms are based on a standard operating system (UNIX System V) and standard graphics and networking interfaces. Intergraph also features a breadth of product solution options.

The company, however, continues to support the DEC VAX product line, which it originally sold on a minicomputer /terminal turnkey system. Intergraph has developed internally more than 300 applications, many of which are VAX-based. Networking capability is also provided between the company's workstations and the VAX computers.

The advantage to Intergraph's RISC Clipper chip-based workstation line is that by adopting industry workstation standards, the company provides connectivity to other industry platforms. At the same time, Intergraph achieves higher overall gross margins on the hardware portion of the turnkey system sale. Approximately 10% of the company's R&D effort is in hardware development and 90% is in software development. The profitability in hardware helps fund the major development effort in software required to maintain a competitive market position as well to to maximize market potential in its vertical market channels.

The company also has a relatively new PC CAD product line, called Micro Station PC and Micro Station 32, which run on DOS-based IBM PCS and its low-end UNIX-based workstation product line.

Integraph also recently signed its first major OEM contract for its workstation product with DuPont's Imaging Division, which could lead to purchase of up to 50,000 of its Clipper chip-based workstation product.

6. HBO & Co. (Atlanta, GA)

HBO is a leading supplier of hospital and health care-related information services. Its product run on mainframe, minicomputer and microcomputer platforms.

HBO re-examined its turnkey business and refocused its business strategies following a decline in one-time sales revenue beginning in 1986. In addition, earnings were negatively affected in 1986 following the acquisitions of Mediflex Systems Corporation and Amherst Associates, Inc., which effectively doubled the size of the company.

In 1986 HBO shifted its turnkey system pricing strategy from stressing all-inclusive, long-term service agreements (where the customer pays a monthly fee for the use of software and related hardware) to an unbundled pricing strategy allowing customers to purchase hardware and software outright.

In addition, the company has established a service organization of more than 100 account managers, which provides additional products and services to the company's existing customer base. New sales are handled by a different group of account managers.

The major longer-term product and marketing trends of HBO include becoming more of a software and services company and expanding its software products and services to reach clinical and other health related fields. As a result of the acquisition of Mediflex Systems Corporation and Amherst Associates, HBO now provides application software products, processing services, facilities management, and custom programming professional services. The company also provides hardware sup-

port services through Systems Support, Inc., its hardware maintenance subsidiary and system support services through its network of regional service support centers.

Company revenues in 1987 totaled $175.2 million, a 13% increase over revenues of $154.8 million in 1986. The company also returned to profitability in 1987 with $13.3 million in net income compared to a net loss of $3.6 million in 1986. HBO is one of four companies in the health care-related information services market with more than $100 million in revenues. This competitive structure has not changed in recent years. Industry sources indicate the markets HBO serves will grow at an 11 to 15% annual rate over the next several years.

7. Delphi Information Systems, Inc. (Westlake Village, CA)

Delphi Information Systems is a 12-year-old company that went public in 1987. As a turnkey/VAR, it provides an integrated agency automation system for agents/brokers in the property and casualty insurance field.

The company is the leading vendor in the independent agency automation industry. Its major competition in the independent property casualty insurance agent/broker market is from McCracken Corporation, which is 25% owned by Chubb Corporation.

The other principal competitors in the property casualty insurance agency market include captive suppliers to parent companies such as Travelers, and Aetna, etc., which supply systems to their affiliated agents.

Fiscal 1988 revenues were approximately $19 million.

The potential market for the combined independent and captive suppliers totals approximately $500 million. Current market penetration is an estimated $200 million.

Delphi provides UNIX-based systems, which enhance hardware portability. The two principal hardware platforms supported by the company include the IBM RT PC (with IBM's Advanced Interactive Executive (AIX) UNIX operating system) and a UNIX-based Concurrent Computer system.

The open architecture design of the RT allows users to expand the system's hardware and software capabilities with existing and future technologies, which reflects the company's philosophy "customer growth without replacement."

Delphi also offers a full range of support services, such as installation, training, documentation, custom development, and software and hard-

ware maintenance, and is also described as a systems integrator. Hardware maintenance is also provided by IBM.

The chairman and CEO of Delphi, Walter Bauer, also founded Informatics, one of the pioneering companies in the software/VAR industry.

The operational philosophy of Delphi, much of which reflects Dr. Bauer's approach to the VAR industry, is to remain focused on a particular market, impose strong internal management controls, and to raise capital through the use of the public markets.

The company recently announced a five-year, $40 million contract with CIGNA Property & Casualty Agency for a full-function agency automation system, which is thought to be one of the larger contracts of its kind in the history of the insurance and agency automation industries. This contract is also a major breakthrough in establishing a customer base with insurance carriers and the captive/affiliated agent/broker market, in addition to its traditional independent agency/broker customer base. As part of the agreement, CIGNA also purchased stock warrants, which if exercised could represent the purchase of up to 11% of Delphi's outstanding stock at $7.50 per share.

Future product development programs include electronic data interface (EDI) systems that link insurance carriers' mainframe systems to those of agents and brokers. Delphi is a leading developer of EDI interfaces between the carriers and the agent/brokers, a service that is helping to reduce policy information interchange costs, improve overall service to the insured, and provide a closer relationship between the agent and carrier.

Two trends in the property casualty insurance industry benefiting Delphi include the trend to outside purchasing of information services by insurance carriers and the trend of sponsorship programs between carriers and their affiliated agents that allow the agents to obtain low-cost financial arrangements to improve their automation systems.

8. ASK Computer Systems (Mountain View, CA)

ASK Computer Systems, with $142 million sales in fiscal 1988 (June), is a leading factor in the development and marketing of turnkey solutions based on minicomputer hardware from DEC and Hewlett-Packard for manufacturing companies . With the acquisition of NCA Corporation, a leading competitor, in fiscal 1988 (on a purchase method of accounting), ASK has become the dominant supplier of manufacturing informations systems products based on DEC hardware platforms. In 1987, the company also developed cooperative marketing relationships with both DEC and HP.

Unlike several other turnkey systems/VAR vendors, gross margins have actually shown a gradual improvement over the past five years, from 48.9% in fiscal 1984 to 52.4% in fiscal 1988. Operating margins, however, have declined from a high of 15.4% in fiscal 1985 to 9% in fiscal 1988. This primarily reflects increases in sales expenses as the company expanded to an international marketing focus.

The original focus of the company was on the discrete manufacturing environment, particularly electronics companies, but has since expanded into the process manufacturing environment.

Including fiscal 1988,which reflected revenue contribution from the NCA acquisition in 1987, sales grew at an annual rate of 17%.

Principal benefits of the NCA acquisition include gaining access to NCA's customer base (NCA had been ASK's major competitor in the DEC VMS/VX environment) and improving accessibility to DEC.

ASK Computer is one of the original major turnkey systems companies that has never used a proprietary (self-developed) hardware strategy. Originally porting the software to HP computers (which now includes HP's RISC-based Spectrum family), the product was subsequently ported to DEC minicomputers. These two company's hardware represent today a substantial portion of the total manufacturing information systems market in the discrete manufacturing environment.

The acquisition of NCA and its MAXCIN (TM) CIM product increased the market potential of the company's product line.

Overall, ASK Computer Systems represents a model for successful, long-term survival of a turnkey systems company. The company significantly expanded its software product offerings in its targeted market (manufacturing), both through internal development and careful acquisition in its market speciality. It also expanded from a manufacturing shop planning product emphasis (MRP) to a total integrated (data base) information management system for manufacturing companies. In addition, ASK Computer continued to upgrade its MRP product with additional modules in emerging, high-growth markets, such as EDI and just-in-time (JIT) inventory management.

Also, the company has significantly expanded its services business, with increased emphasis on consulting and systems integration.

Another key to the company's success was its targeting of a major market early in a new product development cycle and its developing a leading market share position in that market.

9. Eastman Kodak (Billerica, MA)

Kodak's Legal Systems, which is part of Kodak's Electronic Prepress Systems, has recently begun marketing a turnkey legal office automation solution. The Legal Systems unit offers standard office applications such as financial management, text retrieval, and electronic mail in addition to software modules specifically for lawyers, such as conflict searching.

The software applications operate under UNIX, which runs on hardware from DEC, IBM and Computer Consoles. Also included is Legal Desktop, an X-Windows-like user interface developed by Cognition, Inc. Kodak Legal Systems has exclusive rights to the interface in the legal industry.

Kodak indicates that its basic product offering strategy in turnkey systems is not to develop its own programs but to form strategic alliances with other software developers to obtain the needed solutions.

The specific targeted niche in the legal systems turnkey systems market is attorneys rather than secretaries and other support staff.

D

Turnkey Systems/ VARs' Competitive Advantages and Disadvantages

The computer systems vendors will increasingly need to provide turnkey and/or value-added solutions for the following reasons:

- Significant market opportunities in industry-specific markets
- Increasing user requirements for applications software
- Account control, particularly for the small- to medium-sized business accounts
- The need to provide a total solution
- The need to provide customized solutions

The independent turnkey systems/VARs have certain competitive advantages in marketing value-added turnkey solutions compared with the computer system companies. Details are in Exhibit V-3.

These competitive advantages suggest that providing a total (often customized) solution for niche-oriented markets (with low overhead and flexible company operating structure, which draws upon particular application expertise), can provide a very competitive marketing approach.

EXHIBIT V-3

TURNKEY SYSTEMS/VAR COMPETITIVE MARKETING ADVANTAGES

- Knowledge of Local Markets
- In-Depth Knowledge of Individual Vertical Markets
- Easier Access and Less Overhead in Marketing to Geographic Areas and Specialized Application Niches
- Cost Competitive in Moving Lower-Priced Microcomputer-Based Product
- Rapport with Small Business Managers
- Flexibility of Response
- Current Lack of Major Internal Application Software Product at Many Computer Systems Companies to Addresss Industry-Specific Markets
- Customization Capabilities
- Account Control (at Low End of Spectrum)

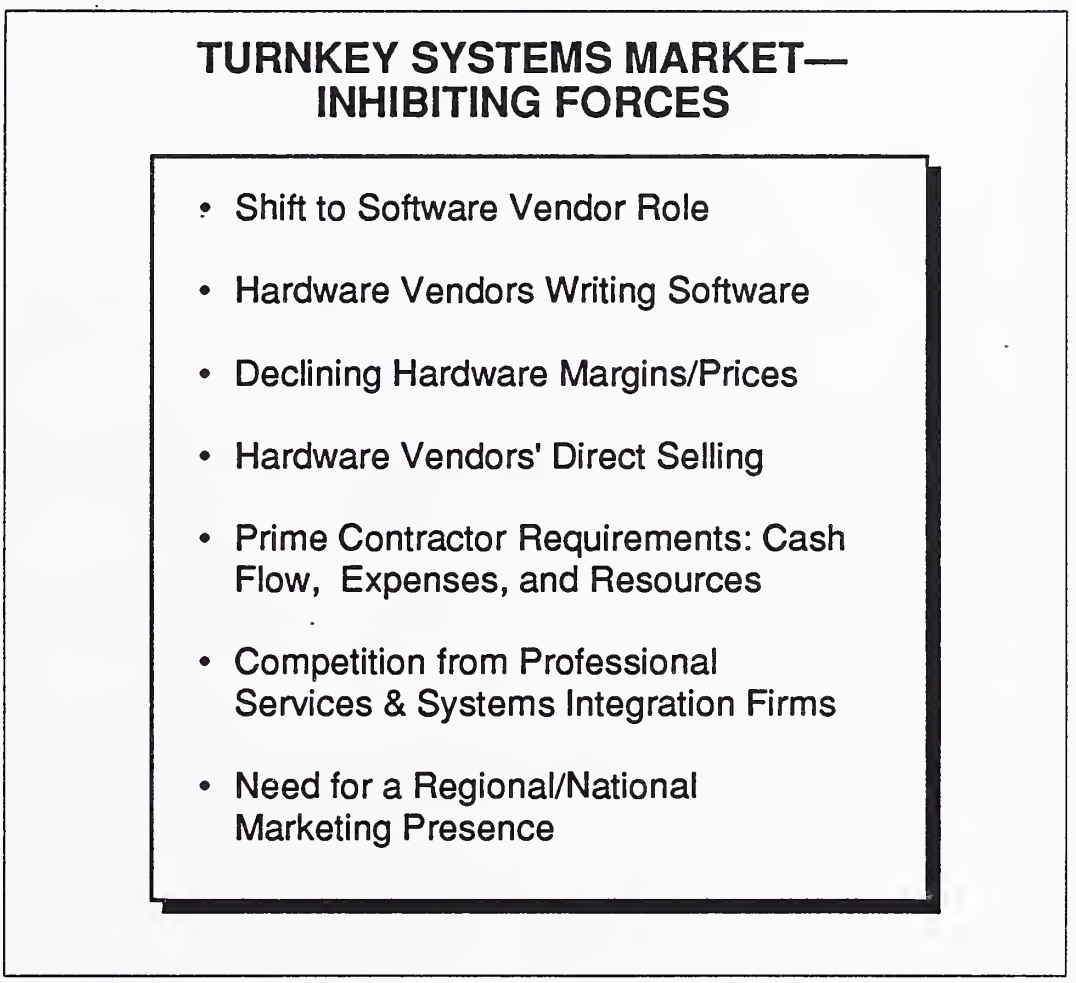
However, there are also a number of negative factors (disadvantages) that could inhibit the growth potential of the independent turnkey systems/VAR vendors over the next several years, including:

- Competitive encroachment from hardware manufacturers' direct sales organizations
- Increasing competition from professional services and systems integrators that market total systems solutions
- Declining hardware margins for the turnkey systems/VAR, related to the more commodity-related nature of standard hardware platforms
- Frequent lack of a multiregional marketing presence, which can significantly reduce potential market size
- Limited capital resources and difficulty in accessing public markets

- Trend to lower discount rates and higher quotas from hardware vendors
- Increasing number of strategic alliances between hardware and software developers to directly address the vertical, turnkey solution markets
- Lack of seasoned management for many smaller VARs

These market inhibitors are listed in Exhibit V-4.

EXHIBIT V-4



In recent years, some of the largest computer systems companies have introduced major new product lines that can be described as turnkey systems products, such as IBM's SolutionPacs and AS/400 Office, DEC's Solution Systems, and, most recently, the Unisys purchase of Convergent, with its major VAR program.

E

Future Product Opportunities

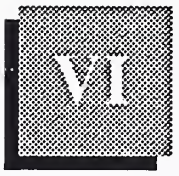
During the next five years, the product applications listed below should represent above-average growth potential:

- Telecommunications (RBOC markets)
- Desktop and electronic publishing

- Health care
- Manufacturing (particularly CIM)
- State and local governments (include college administrative software)
- Banking and finance (following a near-term slowdown in the brokerage industry)
- Genetic engineering
- Artificial intelligence—particularly the use of expert systems in decision-based modeling applications or product cost estimation systems
- Security encryption devices, particularly LAN encryptors
- Open Systems Interconnect software (Retix, an OEM VAR/systems integrator and supplier of OSI software, recently announced its intent to introduce a new turnkey end-user product)
- Multiuser software solutions based on UNIX, which can provide portability from PC to mainframe platforms (UNIX), and more-flexible networking solutions
- Network applications software, such as groupware document management and products based on LAN Servers, for network relational database system access
- Project management software programs for Computer-Aided Planning (CAP) and services (PC-to-mainframe) for improved product scheduling and financial controls
- Systems software products that should help strengthen the competitive position of turnkey systems/VAR suppliers include:
  - CASE tools to improve software development and maintenance productivity
  - Application development programs, such as IBM's SAA and similar programming environments to enhance flexibility of software usage.

VI

Conclusions and Recommendations



Conclusions and Recommendations

Survival in the turnkey systems/VAR market involves the ability to generate a strong cash flow to fund new product development and an expansion-oriented marketing effort. Increasingly, survival will require the capability to successfully compete with the new, more formidable turnkey solution marketing efforts of the computer systems vendors, large software houses, and major computer retailers.

For longer-term viability in the turnkey systems/VAR marketing channel, the following approaches are recommended:

- Investigate strategic alliances with leading computer hardware vendors to leverage marketing capability
- Seek out niche markets where the VAR can provide a unique product—with the intent of establishing a dominant market share
- Focus on services such as consulting, systems integration, education/training, and software customization that tie the customer to the VAR
- Concentrate on marketing to the current customer base to increase productivity of the marketing force. Seek to increase repeat business from a typical 20 to 25% level to 50 to 60% range, which also provides a greater sense of VAR stability
- Increase account control by stressing hardware and software add-ons
- Stress value-added components from services such as software maintenance, consulting, client education and training, which provides a steady revenue base and user feedback on new product needs
- Approach pricing of software product from a value-added perspective

- Develop a system for measuring the competitive environment and level of market penetration—possibly work with a consultant such as the Big Eight accounting firms that are expanding such services to VARs

- Provide growth through a balance of internal software development and acquisitions. Also provide an integrated, modular software product offering, which facilities purchasing additional modules

- Improve the quality of systems documentation to enhance productivity of the VAR's hotline support systems

- Develop applications around industry standards and open systems architectures to increase hardware and software flexibility—also, become familiar with conformance testing consortiums such as X/Open and COS, which help assure true vendor compatibility to emerging standards, including the various OSI protocol levels.

- Take advantage of the new, de-facto standard application development tools (SAA, Presentation Manager and other Standard Graphics Interfaces as well as object-oriented software development tools, such as CAS—Communicating Applications Specification) from Digital Communications Assoc. and Intel to speed the application development process and for hardware portability

- Emphasize network integration solutions to improve profit margins and increase account control

- Seek profitability success by multiple reselling of proprietary applications

- Become a multiregional VAR, possibly through the use of agent/brokers to avoid high market penetration issue of local market focus

- Increase the dollar amount of large-system sales by increasing content of nonindustry-specific application software

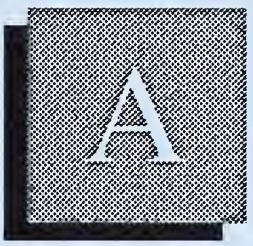
- Stress cost controls, possibly through the use project management software programs

- Manage receivables to maximize cash flow through use of COD payments, vendor-provided third-party leasing, or factoring of receivables

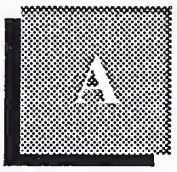
- Minimize inventory carrying costs, possibly by working with master VAR distributors

- Increase emphasis on software product development to provide follow-on products to current customers and for expansion into new, related markets

- Work with vendors that minimize channel conflict and maximize product support by providing training, cooperative advertising, etc.
- Develop user groups to promote feedback on customer product needs as well as to promote customer relations



INPUT Definitions



Appendix: Definitions

Appendix A contains the definitions used by INPUT to describe the Information Services Industry.

Appendix B contains the turnkey systems user expenditure forecast and data base for 1987-1993.

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

- Processing of computer-based applications using vendor computers (called "processing services")
- Network-oriented services or functions such as value-added networks, electronic mail, electronic document interchange, on-line data bases, news data bases, videotex
- Products and services that assist users in performing functions on their own computers or vendor computers (called "software products" or "professional services")
- Services that utilize a combination of hardware and software, integrated into a total system (called "turnkey systems" and/or "systems integration")

A User Expenditures

All user expenditures reported 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

Captive Information Services User Expenditures—Expenditures received from users who are part of the same parent corporation as the vendor.

B

Delivery Modes

1. Processing Services

This category includes transaction processing, utility processing, other processing services, and systems operations.

- *Transaction Processing Services* - Updates client-owned data files by entry of specific business activity, such as sales order, inventory receipt, cash disbursement, etc. Transactions may be entered in one of three modes.
  - *Interactive* - Characterized by the interaction of the user with the system, primarily for problem-solving timesharing, but also for data entry and transaction processing; the user is on-line to the program/files. Computer response is usually measured in seconds or fractions of a second.
  - *Remote Batch* - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements. Computer response is measured in minutes or hours.
  - *User Site Hardware Services (USHS)* - Those offerings provided by processing services vendors that place programmable hardware at the user's site rather than at the vendor's data center. Some vendors in the federal government market provide this service under the label of distributed data services. USHS offers:
    - Access to a communications network
    - Access through the network to the RCS vendor's larger computers
    - Local management and storage of a data base subset that will service local terminal users via the connection of a data base processor to the network.
    - Significant software as part of the service
  - *Carry-in Batch* - Where users deliver work to a processing services vendor
- *Utility Processing* - Vendor provides access to basic software tools, enabling the users to develop their own problem solutions such as language compilers assemblers, DBMS, sorts scientific library routines, and other systems software.

- *"Other" Processing Services* - Include computer output microfilm, other data output services, data entry services, disaster recovery and backup services.

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

Processing services are further differentiated as follows:

- *Cross-industry* services involve the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but that cut across industry lines. Most general-ledger, accounts receivable, payroll, and personnel applications fall into this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific (see below).

- *Industry-specific* services provide processing for particular functions or problems unique to an industry or industry group. Specialty applications can be either business or scientific in orientation. Examples of industry-specialty applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

2. Network Services

Network services include a wide variety of network-based functions and operations. Their common thread is that none of these functions could be performed without network involvement. Network services is divided into two major segments: network applications and electronic information systems.

a. Network Applications

The network applications segment is composed of three subsets:

- *Value-Added Networks (VANs)* - VANs typically involve common carrier network transmission facilities that are augmented with computerized switched. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and TYMNET) employ packet-switching

techniques. However, other added data service features, such as store-and-forward message switching, terminal interfacing, error detection and correction, and host computer interfacing, are of equal importance.

- *Electronic Data Interchange (EDI)* - EDI is the application-to-application electronic communications between organizations, based on established business document standards.

- *Electronic Mail (E-Mail)* - Transmission of messages across an electronic mail network managed by a services vendor.

b. Electronic Information Services

Electronic information services are data bases that provide specific terminal-based inquiry such as stock prices, legal precedents, economic indicators, medical diagnosis, airline schedules, current news stories, automobile valuations, etc. Users typically inquire into and extract information from these data bases but do not update them.

3. Software Products

This category includes user purchases of applications and systems software packages for in-house computer systems. Included are lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites.

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

There are several subcategories of software products, as indicated below.

a. Applications Software Products

Applications software products perform functions directly related to solving user's business or organizational need. The products can be:

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

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

b. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. These products include:

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

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

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

4. Turnkey Systems

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

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

- Turnkey systems revenue is divided into two categories.

  - *Industry-Specific Systems* - Systems that serve a specific function for a given industry sector, such as automobile dealer parts inventory, medical recordkeeping, or discrete manufacturing control systems

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

- Revenue includes hardware, software, and support functions.

5. Systems Integration (SI)

Systems integration (SI) is the delivery of complex, multidisciplinary multivendor systems, incorporating some or all of these products or services: systems design, programming, integration, equipment, communication networks, installation, education and training, SI-related professional services, and system acceptance. Systems integration contracts typically include custom software, take more than a year to complete, and involve a prime contractor assuming full risk and accepting full responsibility.

6. Professional Services

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

- *Software Development* - Development of a software system on a custom basis. It includes one or more of the following: user requirements definition, system design, contract programming, documentation.
- *Education and Training* - Products and/or services related to information systems and services for the user, including computer-aided instruction (CAI), computer-based education (CBE), and vendor instruction of user personnel in operations, programming, and maintenance.
- *Consulting Services* - Information systems and/or services management consulting, project assistance (technical and/or management), feasibility analyses, and cost-effectiveness trade-off studies.
- *Systems Operations (Professional Services)* - This is a counterpart to systems operations (processing services) except the computing equipment is owned or leased by the client, not by the vendor. The vendor provides the staff to operate, maintain, and manage the client's facility.

C
Equipment/Computer Systems

1. Equipment

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

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

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

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

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

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

- *Terminals* - Three types of terminals are described below:

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

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

  - *User Nonprogrammable*

    ° Single-station
    ° Multistation shared processor
    ° Teleprinter

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

2. Computer Systems

Computer systems include all processors from microcomputers to super-computers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices.

- *Microcomputer (Price below $15,000)* - Combines all of the CPU, memory, and peripheral functions of an 8- or 16-bit computer on a chip in the form of:

  - Integrated circuit package
  - Plug-in board with more memory and peripheral circuits
  - Console including keyboard and interfacing connectors
  - Personal computer with at least one external storage device directly addressable by the CPU

- *Workstation (Price between $10,000 and $100,000)* - An integrated multifunctional workstation capable of routine higher-speed communications with mini and mainframe computers and of performing complex local processing. While similar to microcomputers, the workstation typically will have 16- or 32-bit architectures, plus greater graphics and integrated communications capabilities.

- *Minicomputer (Price between $15,000 and $350,000)* - Usually a 16- or 32-bit computer. May represent a portion of a larger system or a complete stand-alone system by itself.

  - Personal business computer
  - Small laboratory computer
  - Nodal computer in a distributed data network, remote data collection network, or connected network, or connected to remote microcomputers

- *Mainframe (Price above $350,000)* - Typically a 32- or 64-bit computer with extensive applications software and a number of peripherals in standalone or multiple-CPU configurations for business (administrative, personnel, and logistics) applications; also called a general-purpose computer.

- *Supercomputer* - High-powered processors with numerical processing throughout that is significantly greater than the fastest general-purpose computers, with capacities in the vicinity of 10-50 million floating point operations per second (MFLOPS). Supercomputers fit in one of two categories:

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

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

    - Parallel processors
    - Pipeline processor
    - Vector processor

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

D
Telecommunications

1. Networks

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

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

- *Value-Added Network (VAN)* - (See listing under Section B.2, Delivery Modes.)

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

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

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

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

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

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

2. Transmission Facilities

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

- *Mode* - may be either:
  - *Analog* - Transmission or signal with continuous-waveform representation, typified by AT&T's predominantly voice-grade DDD network and most telephone operating company distribution systems
  - *Digital* - Transmission or signal using discontinuous, discrete quantities to represent data, which may be voice, data, record, video, or text, in binary form
- *Media* - May be any of the following:
  - *Wire* - Varies from earlier single-line teletype networks, to two-wire standard telephone (twisted pair), to four-wire full- duplex balanced lines
  - *Carrier* - A wave, pulse train, or other signal suitable for modulation by an information-bearing signal to be transmitted over a communications system, used in multiplexing applications to increase network capacity
  - *Coaxial Cable* - A cable used in HF (high-frequency) and VHF (very high frequency), single-frequency, or carrier-based systems; requires frequent reamplification (repeaters) to carry the signal any distance
  - *Microwave* - UHF (ultra-high-frequency) multichannel, point-to-point, repeated radio transmission; also capable of wide frequency channels
  - *Optical Fiber* - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers and TDM for multichannel applications
  - *Communications Satellites* - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but requiring suitable groundstation facilities for up- and down-link operation
  - *Cellular Radio* - Network of fixed, low-powered two-way radios that are linked by a computer system to track mobile phone/data set units. Each radio serves a small area called a cell. The computer switches service connections to the mobile unit from cell to cell.

E

Other Considerations

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

The standard industrial classification (SIC) codes are used to define the economic activity contained in generic sectors such as process manufacturing, insurance, or transportation.

The specific industries (and their SIC codes) included under these generic industry sectors are detailed in the exhibit.

EXHIBIT A-1

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
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
Transportation	40	Railroads
	41	Local Transit
	42	Motor Freight
	43	U.S. Postal Service
	44	Water Transportation
	45	Air
	46	Pipelines
	47	Transportation Services

EXHIBIT A-1 (Cont.)

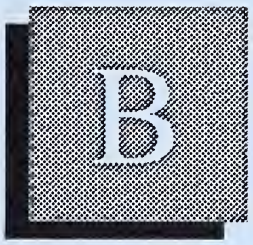
INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
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
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

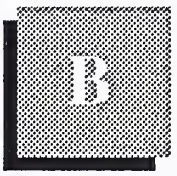
EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Services	72	Personal Services
	73	Business Services (Excluding Information Services Companies Themselves)
	89	Miscellaneous Services
	66	Combinations of Real Estate, Insurance, Loans, Law Offices
	81	Legal Services
	76	Miscellaneous Repair
Federal Government	N/A	As Appropriate
State and Local Government	N/A	As Appropriate
Other Industries	01-09	Agriculture, Forestry, and Fishing
	15-17	Construction
	70	Hotels, Rooming Houses, Camps, and Other Lodging Places
	75	Automotive Repair, Services, and Garages
	78	Motion Pictures
	79	Amusement and Recreation Services, except Motion Pictures
	83	Social Services
	84	Museums, Art Galleries, Botanical and Zoological Gardens
	86	Membership Organizations



Turnkey Systems/User Expenditures Forecast

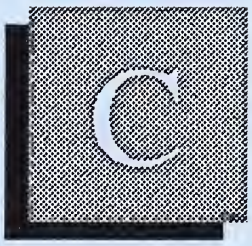


Appendix: Turnkey Systems User Expenditures Forecast

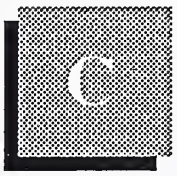
EXHIBIT B-1

TURNKEY SYSTEMS USER EXPENDITURE FORECAST BY INDUSTRY SECTOR, 1988-1993 (In Millions of Dollars)

Industry Sector	1987	87-88 Growth (Percent)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (Percent)
Total Information Services Industry	8,527	12	9,528	10,577	11,678	12,787	13,939	15,151	10
Discrete Manufacturing	1,661	20	2,001	2,197	2,397	2,592	2,788	2,990	8
Process Manufacturing	371	9	403	447	492	537	583	630	9
Transportation	144	9	157	175	195	214	235	256	10
Utilities	30	10	33	37	41	45	49	54	10
Telecommunications	239	14	272	315	362	413	469	531	14
Retail Distribution	577	10	632	700	771	842	913	988	9
Wholesale Distribution	319	14	365	412	462	514	568	625	11
Banking & Finance	712	10	781	873	970	1,068	1,170	1,277	10
Insurance	196	18	232	255	278	301	324	347	8
Medical	606	10	665	750	842	936	1,036	1,144	11
Education	168	9	183	203	224	242	266	286	9
Services	408	11	451	509	570	633	700	771	11
Federal Government	368	6	389	423	457	490	522	555	7
State & Local Government	110	12	123	140	159	178	198	220	12
Other Industry Sector	317	9	345	382	420	459	498	539	9
Total Industry Sectors	6,226	13	7,032	7,818	8,640	9,464	10,319	11,213	10
Cross-Industry Sector									
Accounting	391	3	402	421	438	452	464	475	3
Education & Training	143	4	149	157	165	172	178	184	4
Engineering & Scientific	307	7	330	369	410	451	494	540	10
Human Resources	100	9	109	115	121	126	131	136	5
Office Systems	750	13	851	986	1,135	1,295	1,470	1,662	14
Planning & Analysis	273	5	286	299	312	322	330	338	3
Other Cross-Industry Sector	337	9	369	412	457	505	553	603	10
Total Cross-Industry Sectors	2,301	8	2,496	2,759	3,038	3,323	3,620	3,938	10



Turnkey Systems/VAR Data Base Reconciliation



Appendix: Turnkey System/VAR Market Data Base Reconciliation

This appendix contains the following information:

- Exhibit C-1, which includes the changes made in this year's forecast as compared to last year's
- An explanation of any significant changes that were made to the forecasts

The growth rate projection for the overall turnkey systems/VAR market in the 1987 and 1988 INPUT forecasts remains approximately the same. The higher growth rate projection in 1988 for the Other cross-industry sector reflects the positive impact expected from "total solutions" selling into the office systems environment by the larger computer systems vendors.

The higher growth rate expectations in the academic education markets reflect the inclusion of library turnkey systems product, which have recently been showing strong market acceptance.

EXHIBIT C-1

TURNKEY SYSTEMS— DATA BASE RECONCILIATION OF MARKET FORECAST BY INDUSTRY-SPECIFIC AND CROSS-INDUSTRY MARKETS

Delivery Mode	1987 Market			1992 Market		1987-1992 CAGR Fcst. in 1987 Rpt. (%)	1988-1993 CAGR Fcst. in 1988 Rpt. (%)
	1987 Fcst. ($ M)	1988 Rpt. ($ M)	Variance as Percent of 1988 Rpt.	1987 Fcst. ($ M)	1988 Rpt. ($ M)		
Discrete Manufacturing	1,861	1,661	(12)	2,997	2,788	10	8
Process Manufacturing	367	371	+1	591	583	10	9
Transportation	150	144	(4)	264	235	12	10
Utilities	31	30	(3)	57	49	13	10
Telecommunications	249	239	(4)	479	469	14	14
Distribution	601	896	+33	1,059	1,481	12	10
Banking and Finance	741	712	(4)	1,249	1,277	11	10
Insurance	204	196	(4)	360	347	12	8
Medical	633	606	(4)	1,019	1,136	10	11
Education	107	168	+36	143	286	6	9
Services	414	408	(2)	637	771	9	11
Federal Government	388	368	(5)	590	555	9	7
State & Local Government	117	110	(6)	236	220	15	12
Other Industry-Specific	131	317	+59	221	539	11	9
Total Vertical Markets	5,994	6,228	+4	9,902	11,205	11	10

Continued

EXHIBIT C-1 (Cont.)

TURNKEY SYSTEMS— DATA BASE RECONCILIATION OF MARKET FORECAST BY INDUSTRY-SPECIFIC AND CROSS-INDUSTRY MARKETS

Delivery Mode	1987 Market			1992 Market		1987-1992 CAGR Fcst. in 1987 Rpt. (%)	1988-1993 CAGR Fcst. in 1988 Rpt. (%)
	1987 Fcst. ($ M)	1988 Rpt. ($ M)	Variance as Percent of 1988 Rpt.	1987 Fcst. ($ M)	1988 Rpt. ($ M)		
Cross-Industry Sector:							
Planning and Analysis	284	337	-16	370	603	5	10
Accounting	414	391	+6	514	475	4	3
Education and Training	149	143	+4	189	184	5	4
Engineering and Scientific	354	307	15	508	540	7	10
Human Resources	235	232	+1	300	313	5	4
*Other Cross-Industry-Specific	1,208	1,087	+11	1,542	2,265	5	10
Total Cross-Industry Markets	2,476	2,433	+2	3,423	4,115	5	9
Total Turnkey Systems/ VAR IS Industry	7,799	8,660	-10	13,325	15,320	9	10

*Includes office systems, cross-industry distribution, sales and marketing, and electronic publishing.