

**OPPORTUNITIES FOR INVESTMENT
IN THE
COMPUTER SERVICES INDUSTRY
1977 EDITION**

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~~Opportunities For Invest-~~
~~ment in the Computer~~
~~Services Industry - 1977~~
Edition (1977)

OPPORTUNITIES FOR INVESTMENT IN THE COMPUTER SERVICES INDUSTRY

1977 EDITION

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INTRODUCTION

INTRODUCTION

A. PURPOSE OF THE REPORT

- In the course of working with both the investment community and the computer services industry, INPUT recognized the need for a better understanding of the industry by the investment community and others who are interested in high technology based businesses. More often than not, computer services have been regarded as a stepchild of the hardware industry.
- The fact is that the U.S. computer services industry is today more than a \$6 billion industry, growing about 16% a year with some subsectors growing at nearly 25% a year. By 1982, the industry will have revenues of \$14.3 billion and will account for roughly 20% of all expenditures relating to data processing, while hardware will account for 30%. (The other 50% covers utilities, supplies, and in-house salaries.) The main purpose of this report is to provide information useful to the analyst in the process of evaluating the growth and investment potential of computer services companies. Recommendations for specific investments are not given, nor is it the intention to do so.
- This report is designed to be used by:
 - Analysts, to assist in the evaluation of computer services companies.
 - Managers of publicly held computer services companies, to assist in comparing performance with competition.

- Managers of privately held companies, to assist in establishing a market value.
- Managers of companies not now participating in computer services, to assist in evaluating the prospects for diversification.
- Large users of computer services, to better understand the direction and nature of the industry.

B. REPORT ORGANIZATION

This report is organized in the following manner:

- In Chapter I, EXECUTIVE SUMMARY, a synopsis of the report is presented in abbreviated form.
- In Chapter II, INDUSTRY STRUCTURE, the composition of today's computer services industry is presented with some historical insights and future perspective provided. Historical financial data on several firms is also presented.
- In Chapter III, THE MARKET, forecasts of market growth through 1982 are presented by activity and by application. Also presented is a handy "growth model matrix" which can be used as a quick guide for the assessment of the medium term growth potential of any computer services company.
- In Chapter IV, EVALUATION CRITERIA, are composite financial ratios for two groups of successful companies; those with sales of over \$20 million and those with sales under that amount. These statistics can be used as models for comparison with those of any company under study. Also discussed are other less tangible evaluation criteria such as market share, acquisition policies, contract mix, etc. Last, a list of "success keys" useful for qualitative evaluation of a company is provided.

- In Chapter V, DRIVING FORCES, the implications of business and economic factors are discussed along with a discussion of the likely impact of other specific external forces including IBM and the Federal Government.
- In Chapter VI, MANAGEMENT VIEWS, are commentaries provided by the presidents and CEOs of several leading companies in the industry. the views expressed in these commentaries are, in all cases, those of the authors.
- In Chapter VII, INDUSTRY PARTICIPANTS, there are brief reviews of 27 specific companies drawn from the ranks of the independents, spinoffs, and hardware manufacturers. Each review gives information on the company concerning its products, markets, revenues, personnel distribution, management, and other important data.

C. RESEARCH METHODOLOGY

- Most of the information for this report was derived from some 2,000 personal and telephone interviews carried out by members of INPUT's staff during 1977. These interviews were conducted with users of computers and computer services, other knowledgeable company executives, and vendors. The conclusions and data presented in this report are a result of an analysis of this interview data coupled with the expertise and judgement of INPUT's research staff.
- The "Company Highlights" given in Chapter VII were taken directly from INPUT's Company Analysis and Monitoring Program for The Computer Services Industry, a subscription service providing information about computer services organizations.
- Inquiries and comments from clients on the information presented, suggestions for changes in the structure or contents of this report or requests for additional research are welcome.

I. EXECUTIVE SUMMARY

I EXECUTIVE SUMMARY

A. PAST CRITERIA FOR INVESTMENT ARE OUTDATED

- Investors and investment advisors should now review the computer services industry for quality investment opportunities. In the past few years, many firms in the computer services industry have lacked investor support. This was due to a variety of concerns such as:
 - Stability of companies in an industry with perceived relative ease of entry.
 - Predictability of company performance.
 - Management judgement, remembering failures or large write-offs at several companies in the late 1960s and early 1970s.
 - Dominance of computer equipment in investor thinking.
 - Risk associated with computer services companies investments in view of the 'prudent man' rule.
 - Market size for computer services company stocks and volatile stock prices.

- Based on recent INPUT studies of the industry and its participants, many of these concerns can now be addressed and answered in a positive manner.
- The industry has demonstrated growth of 15%-20% per year, 2 to 3 times faster than the GNP. No saturation of end user demand is in sight at this writing.
- The leading companies have achieved a record of solid growth in revenue and profits, even during the 1974-75 recession. The industry appears today to be "recession resistant".
- As shown in Exhibit I-1, this growth performance has been generally experienced across different sizes of companies within the industry. Results reported thus far in 1977 continue to support the trend. For example, three industry leaders recently reported fiscal 1977 results as follows:

COMPANY	FISCAL 1977		GROWTH '76-'77	
	REVENUE	PROFIT	REVENUE	PROFIT
AUTOMATIC DATA PROCESSING	\$145M	\$23M	23%	25%
COMPUTER SCIENCES CORP.	\$235M	\$11.6M	7%	61%
ELECTRONIC DATA SYSTEMS	\$164M	\$16.4M	23%	21%

EXHIBIT I-1
REVENUE PERFORMANCE
OF SELECTED PUBLIC COMPUTER SERVICES COMPANIES
1974-1976

COMPANY * SIZE (ANNUAL REVENUE)	NUMBER OF COMPANIES IN SAMPLE	AGGREGATE REVENUES			GROWTH RATE 1974-1975	GROWTH RATE 1975-1976	GROWTH RATE 1974-1976
		1974	1975	1976			
OVER \$100M	3	\$335M	\$448M	\$541M	15%	21%	39%
\$20 - 100M	4	160	178	216	11	22	35
UNDER \$20M	7	68	84	100	25	18	47
TOTAL	14	\$616M	\$710M	\$856M	15%	21%	39%

(M = MILLION)
* THE INDIVIDUAL COMPANIES ARE IDENTIFIED IN SECTION II OF THIS REPORT.

- For 14 companies analyzed in this report, profits increased from a total of \$77.7 million in 1974 to \$116.6 million in 1976, an increase of 50% (See Exhibits I-1 and I-2 on a total revenue increase of 39% in that two year period.
- Established companies have progressed to the point where it is very difficult for new market entries to have major impact on them.
- Computer services industry growth will continue at a 16% average annual growth rate through 1982. The number of users of all types and sizes is increasing.
- There are several multi-hundred million dollar independent public companies such as Automatic Data Processing, Computer Sciences, Electronic Data Systems, and shortly, Tymshare. Additionally, several much larger companies such as Control Data and Intel have made computer services a major corporate growth target. Control Data is a \$1.2 billion company with services revenues over \$500 million, the largest computer services company in the U.S.

B. A NEW INDUSTRY PERSPECTIVE

- The computer services industry is comprised of a large number (2,000 processing and 3,000 software suppliers) of diverse businesses built on the premise of leveraging professional skills, software, networks and computer hardware. Early in the industry's development, hardware was the principal lever. Today it is software. In the future it will be the abilities of applications specialists, as the cost of both hardware and software decrease dramatically in the years to come.

EXHIBIT I-2
PROFIT PERFORMANCE
OF SELECTED PUBLIC COMPUTER SERVICES COMPANIES
1974-1976

COMPANY SIZE (ANNUAL REVENUE)	NUMBER OF COMPANIES IN SAMPLE	AGGREGATE PROFITS			GROWTH RATE 1974-1975	GROWTH RATE 1975-1976	GROWTH RATE 1974-1976
		1974	1975	1976			
OVER \$100M	3	\$54.4M	\$61.5M	\$76.0M	13%	24%	40%
\$20-100M	4	16.3M	24.7M	26.4M	51%	7	62
UNDER \$20M	7	7.0M	9.1M	9.2M	30%	1	31
TOTAL	14	\$77.7M	\$95.3M	\$116.6M	23%	23%	50%

(M=MILLION)

- Labels such as "time-sharing", "facilities management", "turnkey systems", are starting to disappear as companies increasingly sell solutions at a "fixed" price. The end user does not see the mechanism—only the results. One result will be that the proportion of total user expenditures for computer services will increase as users learn that specialized skills will be cheaper to buy than to develop internally.
- In addition to the independent companies, the industry is attracting notice and participation from many quarters:
 - Large Companies in the aerospace, petroleum, communications, insurance and banking industries who see an opportunity to capitalize on an existing investment or are desirous of getting into businesses with higher growth rates than their own.
 - Universities seeking to increase funding for research.
 - Accountants and other professionals attempting to support their clients with a broader range of services.
 - Mainframe Manufacturers to expand market opportunities.
- As services firms become more intimately tied into the industries they serve, they are beginning to provide services extending beyond their traditional scope. Electronic Data Systems, for example, is in the insurance business as a result of its medical claims processing activity; Bradford operates a bank as an outgrowth of its bank processing expertise; TRW operates credit bureaus as an outgrowth of its credit validation systems.
- The future of the industry is limited only by the imagination and the resources of its participants. It offers, today, a number of attractive investment alternatives.

C. COMPANY AND MARKET CHARACTERISTICS

In addition to growth in revenues and profits, there are other less quantifiable factors which should be considered in analyzing computer services companies:

- In-house minicomputers and microcomputers are taking some revenue from services companies. However, many services vendors are leading the way in integrating new hardware developments into their services by offering minicomputers, terminals, turnkey systems, distributed processing, and advanced software. As a result, the net impact of minicomputers on revenues of services companies will be positive.
- In 1979, IBM will be freed from the constraints of its agreement with Control Data prohibiting its participation in U.S. computer processing services markets and may re-enter the market. As with IBM's entry into the small business computer market, the effect of IBM's full entry into computer services will expand the total market by placing its 'imprimatur' on services as a viable alternative to in-house data processing, and by furthering the education of many prospective new users.
- Under pressure from Congress, the GAO and OMB with help from GSA, the Federal Government is rapidly increasing procurement of computer services from the private sector rather than buying equipment or hiring internally.
- Many computer services firms are generating cash at an extremely rapid rate. As a result they are:
 - Meeting operating, expansion, and new product development needs with internally generated funds.
 - Avoiding the acquisition of new outside capital with attendant dilution.
 - Able to make acquisitions with cash as well as stock.

- Computer services vendors are rapidly building assets, some of which do not appear on balance sheets. These are, nonetheless, valid for consideration in investment analysis.
 - Longer term customer contracts minimize exposure and permit better planning for operations and capital equipment investment.
 - Companies have invested in proprietary software which provides competitive advantages in maintaining user loyalty, and in avoiding price competition.
 - Companies have built experienced staffs with substantial marketable skills. These staffs enable vendors to be responsive to market demand. Services companies can usually be more flexible and solution-oriented than most hardware companies.
 - Some companies have large customer bases (often exceeding 5,000) who add stability, provide a ready market for introduction of new products, enable the company to leverage its marketing investment dollar, and provide potential for expansion into other services and product areas.
 - Investments already made and written off will contribute substantially to the profitability of many computer services companies over the next 3-5 years.

- Some computer services companies have not participated fully in the growth of the industry. This has invariably been due to internal problems, such as the loss of a single large customer, weak marketing, or poorly advised ventures. Analysts must evaluate the potential exposure of each company to factors which could exclude them from participation in the industry's growth.

- Investments in computer services companies at any level are enhanced and, possibly, protected by the heavy acquisition trend of companies in the business.

- Put in perspective, the industry will grow at more than twice the rate of growth of the GNP, and significantly above the overall rate of growth of the computer equipment industry as shown in Exhibit III-2.

D. MANAGEMENT VIEWS

- As a part of the study, the comments of top executives in leading companies were requested. These are included in full in Chapter VI; excerpts from their statements serve to reinforce these conclusions:

GROWTH: "The services sector of our industry has also grown more rapidly than the hardware sector for a number of years, and industry analysts expect this trend to continue. This is not surprising in view of the corollary fact that the critical, limiting factor in the use of computers is software and its associated technology, not in the hardware itself."

William R. Hoover,
Chairman and President, Computer Sciences Corp.

CASH GENERATION: "Computer services companies should be good cash generating companies because capital startup costs compared to manufacturing are relatively low and the equipment can be leased to avoid a large front-end investment."

Thomas J. Marquez,
Vice President and Director, Electronic Data Systems

INTERNATIONAL: "With the ever-lasting information explosion we view the international computer services market as an opportunity second to none."

Robert M. Price,
President, Computer Group, Control Data Corporation

EVALUATION INDICATORS: "We at UCC try to evaluate computer service and software companies on several indicators: products markets people competition growth rate."

F. L. Harvey,
President, University Computing Company

ACQUISITIONS: "Acquisitions are an important means by which we add competent staff and widen product breadth..."

Richard L. Crandall,
President, Comshare, Inc.

"The reason we feel it (acquisitions) is important is that it is expedient and if done well avoids what otherwise would be a high failure rate for new entries in new industries."

William H. Bird,
President, Intel Corporation/Data Services Division

MARKET SEGMENTATION: "The need to share, have immediate access to, and update information is paramount to many market segments having common characteristics."

J. T. Sullivan,
President, Planning Research/Information Sciences

SIZE: "The parameters of a growing corporation in the computer services industry to be considered successful in the year 1980 must appear as follows:

Sales	\$50,000,000
Pretax Income	\$5-6,000,000
Price/Earnings Ratio	Greater than 10
Dividend Yield	2%-4%
Compound Growth Rate	
Sales	25%
Earnings	35%

Ronald D. Palamara, Ph.D.
President and Chairman of the Board, Anacomp

SPIN-OFFS: "Sun Information Services was created as part of the Sun Company strategy to expand into promising new business areas outside its traditional business."

J. M. Ryan,
President, Sun Information Services (Subs. of Sun Oil Company)

SOFTWARE: "The notion that software can be developed by a group of experts, "productized" in the sense of making it easily useable by many users, and then made available to a multiplicity of users makes economic sense because it provides economic leverage; it raises the productivity level of those charged with producing processed information. That simple but powerful economic fact alone will provide impetus for continued development of software products as an enterprise."

Walter F. Bauer,
President, Informatics

II. INDUSTRY STRUCTURE

II INDUSTRY STRUCTURE

A. BACKGROUND

- The computer services industry emerged shortly after the introduction of the first computer to provide services to users who were either too small to afford their own computers or to provide services which computer manufacturers were either unwilling or unable to perform; or, in the case of manufacturers such as IBM, to acquaint users with computers in order to influence them to buy in-house machines.
- Today the computer services industry generates revenues of over five and one half billion dollars per year, is comprised of over 5,000 firms and is growing at 16% compounded annually.
- The leading companies in the industry today are \$200-\$500 million firms. The spectrum of computer services offered by these companies ranges from programmers-for-hire to the provision of complete systems including hardware, software, lease financing and maintenance. Many companies are expanding the scope of their operations to include new services in such diverse fields as credit verification, stock transfer, payroll, economic forecasting and portfolio management programs.

- The industry is extraordinarily diversified, consisting of the independent companies such as Automatic Data Processing, National CSS and Tymshare; large corporation "spin-offs" such as Boeing Computer Services, McDonnell Automation and Sun Information Services; banks such as Bank of America and Citibank; and computer manufacturers such as Control Data, IBM and NCR. Some companies specialize in very narrow market segments such as Bradford (banks) and Reynolds and Reynolds (automobiles), while others such as Computer Sciences and ITEL/Data Services provide a broad spectrum of services to a number of different markets. As shown in Exhibit II-1, independent companies will retain the largest market share throughout the forecast period.

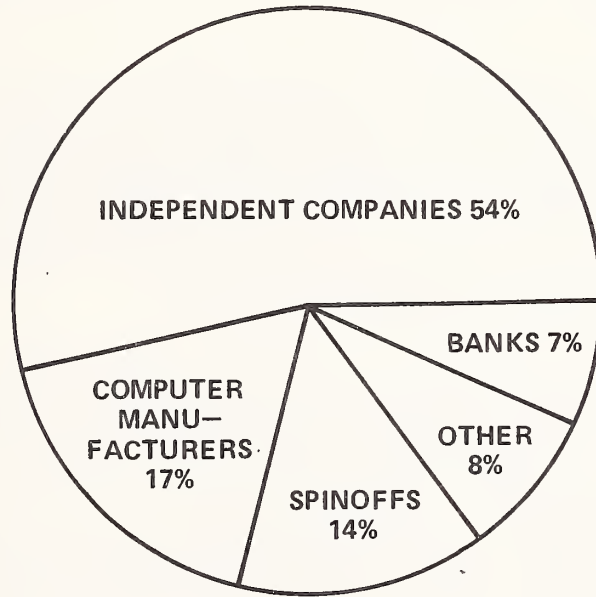
- The character of the computer services industry has changed dramatically since its inception more than 20 years ago. The nature of the industry will continue to change as a result of new technologies, new competitive forces and the world's seemingly insatiable demand for computer power of all kinds.

- When the computer services industry began to evolve and the companies in the industry were small, the activities of each company were homogeneous, easy to understand and easy to classify. For example:
 - A local company would often physically pick up its customer's punch cards or source documents, keypunch the data, process it and deliver finished reports to the client. This kind of company was called a batch service bureau.

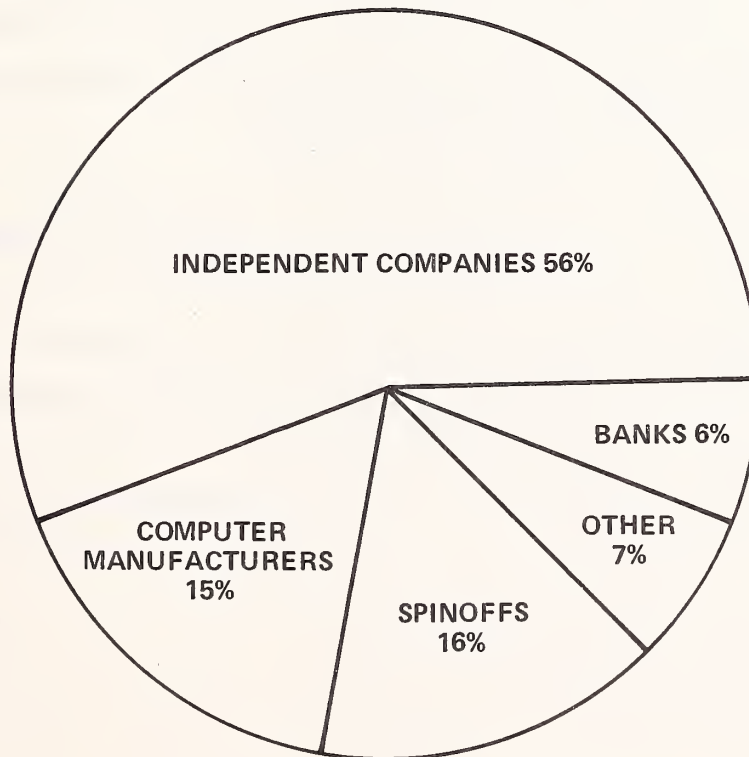
 - When the government needed large numbers of programmers to staff newly authorized projects and could not hire or manage them, it turned to a company that provided contract programming services.

EXHIBIT II-1

MARKET SHARE BY TYPE OF VENDOR



1976 \$5.9 BILLION



1982 \$14.3 BILLION

- When a hardware manufacturer discovered that an outside vendor could write, document and deliver a COBOL compiler (for its about-to-be-announced new computer) faster and cheaper than its in-house development group, it went to a company providing software development services.
- When the software development companies found out that some computer users had similar applications that could be processed with a single program or set of programs, the software products business was born in which "software packages" were sold or leased to many users. (The leverage potential is obvious).
- When data communications systems and software were developed, central computers were able to communicate with many teletypewriters simultaneously. Thus, the time-sharing company 'boom' of the late sixties began. (Some excesses of that period still linger, making many investors wary of investing in the computer services industry.)
- Some computer users had problems managing EDP operations, particularly when they were outside the mainstream of their business. New companies, quick to recognize this problem, offered to take over the management of the user's data processing function and became known as facilities management companies.
- High speed terminals became available and communications more reliable. Both batch service bureaus and time-sharing firms found they could offer better service and faster turnaround to large customers by installing a high speed terminal at the customer's site. In addition, they could extend their geographic range and improve the utilization of their hardware and personnel. Thus evolved "remote batch services".

- As computer technology has changed and evolved, the computer services industry has continued to change and evolve by responding to the challenge--utilizing new technology, pioneering new applications, developing a growing list of computer related services, and consolidating into large companies able to provide a growing array of diversified services.
- Strong companies have acquired weak ones. The survivors have learned how to run a business, how to select and develop new products, what new markets to enter, and, most important, how much to charge to make a reasonable profit.

B. PAST PERFORMANCE OF COMPUTER SERVICES COMPANIES

- The revenues and profits of 14 publicly traded computer services firms are given in the following exhibits:

Exhibit II-2: Companies With Annual Sales Over \$100 Million

Exhibit II-3: Companies With Annual Sales of \$20-\$100 Million

Exhibit II-4: Companies With Annual Sales Of \$20 Million Or Less

- For the three year period 1974-75-76, revenues of 14 key companies analyzed increased 15% from 1974 to 1975, and 21% from 1975 to 1976. For the three year period the revenue increase was 39%; profits increased even more rapidly, up 50% from the 1974 level.
- For ease of comparing the performance between these three groups, a summary of results is provided in Exhibit II-5.
- The solid growth in revenues, profits and equity throughout this period indicates a continuing underlying strength in the computer services industry. It is significant that this growth took place under varied economic conditions and was shared by a range of company types and sizes. The achievement of continued growth depends on a number of factors, discussed in detail in Chapter V.

**PROFITABILITY PERFORMANCE OF COMPUTER SERVICES COMPANIES
WITH SALES OVER \$100 MILLION
FISCAL YEARS 1974, 1975 AND 1976**

COMPANY	FISCAL YEAR ENDING	TOTAL REVENUE	INCOME BEFORE TAXES AND EXTRAORDINARY ITEMS	STOCKHOLDER'S EQUITY	RETURN ON REVENUES %*	RETURN ON EQUITY %**	EQUITY AS A % OF REVENUES
1974 FISCAL YEAR							
COMPUTER SCIENCES CORPORATION	MARCH 28, 1974	\$147.0	\$2.4	\$11.6	1.6%	20.7%	7.9%
AUTOMATIC DATA PROCESSING	JUNE 30, 1974	122.8	22.8	68.4	18.6%	33.3%	55.7%
ELECTRONIC DATA SYSTEMS	JUNE 30, 1974	118.7	29.2	82.9	24.6%	35.2%	69.8%
TOTAL		\$388.5	\$154.4	\$162.9	14.0%	33.4%	41.9%
1975 FISCAL YEAR							
COMPUTER SCIENCES CORPORATION	MARCH 28, 1975	\$177.4	\$7.2	\$15.2	4.1%	47.4%	8.6%
AUTOMATIC DATA PROCESSING	JUNE 30, 1975	154.7	27.2	80.2	17.6%	33.9%	51.8%
ELECTRONIC DATA SYSTEMS	JUNE 30, 1975	123.9	27.1	66.9	21.9%	40.5%	54.0%
TOTAL		\$448.3	\$61.5	\$162.3	13.7%	37.9%	36.2%
1976 FISCAL YEAR							
COMPUTER SCIENCES CORPORATION	MARCH 28, 1976 (MARCH 28, 1977)	\$219.9 (234.7)	\$14.5 (21.2)	\$22.3 (37.0)	6.6% (9.0%)	65.0% (57.3%)	10.1% (15.8%)
AUTOMATIC DATA PROCESSING	JUNE 30, 1976	187.9	34.9	98.5	18.6%	35.4%	52.4%
ELECTRONIC DATA SYSTEMS	JUNE 30, 1976	133.0	26.6	76.1	20.0%	35.0%	57.2%
TOTAL		\$540.8	\$76.0	\$196.9	14.1%	38.6%	36.4%

* RETURN ON REVENUE (GROSS MARGIN = INCOME BEFORE TAXES & EXTRAORDINARY ITEMS / REVENUES)
(\$ MILLIONS)

**PROFITABILITY PERFORMANCE OF COMPUTER SERVICES COMPANIES
WITH SALES FROM \$20 MILLION TO \$100 MILLION
FISCAL YEARS 1974, 1975 AND 1976**

COMPANY	FISCAL YEAR ENDING	TOTAL REVENUE	INCOME BEFORE TAXES AND EXTRAORDINARY ITEMS	STOCKHOLDER'S EQUITY	RETURN ON REVENUE %*	RETURN ON EQUITY %**	EQUITY AS A % OF REVENUES
1974 FISCAL YEAR							
BRADFORD NAT'L TYMSHARE, INC.	DECEMBER 31, 1974	\$59.0	\$4.6	\$40.0	7.8%	11.5%	67.8%
NATIONAL CSS, INC.	DECEMBER 31, 1974	46.5	6.1	15.3	13.1%	39.9%	32.9%
NATIONAL DATA CORPORATION	FEBRUARY 28, 1974	23.7	2.8	6.1	11.8%	45.9%	25.7%
TOTAL	MAY 31, 1974	30.6	2.8	19.4	14.4%	14.4%	63.4%
1975 FISCAL YEAR							
BRADFORD NAT'L TYMSHARE, INC.	DECEMBER 31, 1975	\$57.3	\$8.5	\$43.5	14.8%	19.5%	75.9%
NATIONAL CSS, INC.	DECEMBER 31, 1975	56.4	9.2	20.9	16.3%	44.0%	37.1%
NATIONAL DATA CORPORATION	FEBRUARY 28, 1975 (FEBRUARY 28, 1976)	32.6 (35.6)	3.5 (4.4)	8.0 (10.2)	10.7% (12.4%)	43.8% (43.1%)	24.5% (28.7%)
TOTAL	MAY 31, 1975	31.3	3.5	21.1	11.2%	16.6%	67.4%
1976 FISCAL YEAR							
BRADFORD NAT'L TYMSHARE, INC.	DECEMBER 31, 1976	\$65.8	\$5.5	\$45.9	8.4%	12.0%	69.8%
NATIONAL CSS, INC.	DECEMBER 31, 1976	81.8	13.2	30.5	16.1%	43.3%	37.3%
NATIONAL DATA CORPORATION	FEBRUARY 28, 1976 (FEBRUARY 28, 1977)	35.6 (41.7)	4.4 (5.5)	10.2 (13.4)	12.4% (13.1%)	43.1% (42.1%)	28.7% (32.1%)
TOTAL	MAY 31, 1976	32.9	3.3	10.0	15.9%	15.9%	62.9%
TOTAL		\$21.61	\$26.4	\$107.3	12.2%	24.6%	49.7%

(\$ MILLIONS)

* RETURN ON REVENUE (GROSS MARGIN) = $\frac{\text{INCOME BEFORE TAXES \& EXTRAORDINARY ITEMS}}{\text{REVENUE}}$

** RETURN ON EQUITY = $\frac{\text{INCOME BEFORE TAXES \& EXTRAORDINARY ITEMS}}{\text{TOTAL STOCKHOLDER'S EQUITY}}$

*** BRADFORD RESTATED ITS REVENUES BY EXCLUDING REIMBURSEMENTS FROM CUSTOMERS.

PROFITABILITY PERFORMANCE OF COMPUTER SERVICES COMPANIES
SALES \$20 MILLION OR LESS
FISCAL YEARS 1974, 1975 AND 1976

COMPANY	FISCAL YEAR ENDING	TOTAL REVENUE	INCOME BEFORE TAXES AND EXTRAORDINARY ITEMS	STOCKHOLDER'S EQUITY	RETURN ON REVENUES %*	RETURN ON EQUITY %**	EQUITY AS A % OF REVENUES
1974 FISCAL YEAR							
MATHEMATICA	JUNE 30, 1974	\$11.8	\$1.1	\$3.4	9.3%	32.4%	28.8%
RAPIDATA, INC.	DECEMBER 31, 1974	11.5	.9	3.1	7.8%	29.0%	27.0%
KEYDATA CORP.	JULY 31, 1974	11.7	(.6)	2.7	(5.1%)	(22.2%)	23.1%
COMSHARE INC.	JUNE 30, 1974	9.5	1.4	2.9	14.7%	48.3%	30.5%
ON-LINE SYSTEMS	APRIL 30, 1974	9.9	2.9	5.1	29.3%	56.9%	51.5%
ANACOMP INC.	JUNE 30, 1974	6.0	.5	1.5	8.3%	33.3%	25.0%
COMPUSERVE	DECEMBER 31, 1974	7.2	.8	3.9	11.1%	20.5%	54.2%
TOTAL		\$67.6	\$7.0	\$22.6	10.4%	31.0%	33.4%
1975 FISCAL YEAR							
MATHEMATICA	JUNE 30, 1975	\$14.8	\$1.0	\$3.8	6.8%	26.3%	25.7%
RAPIDATA, INC.	DECEMBER 31, 1975	14.8	2.4	4.4	16.2%	54.5%	29.7%
KEYDATA CORP.	JULY 31, 1975	13.5	.3	3.1	2.2%	9.7%	23.0%
COMSHARE INC.	JUNE 30, 1975	12.3	1.5	4.4	12.2%	34.1%	35.8%
ON-LINE SYSTEMS	APRIL 30, 1975	11.4	2.4	6.3	21.1%	38.1%	55.3%
ANACOMP INC.	JUNE 30, 1975	8.9	1.1	3.1	4.7%	35.5%	34.8%
COMPUSERVE	DECEMBER 31, 1975	8.5	.4	4.4	4.7%	9.1%	51.8%
TOTAL		\$84.2	\$9.1	\$29.5	10.8%	30.8%	35.0%
1976 FISCAL YEAR							
MATHEMATICA	JUNE 30, 1976	\$18.9	\$1.3	\$4.3	6.8%	30.2%	22.8%
RAPIDATA	DECEMBER 31, 1976	15.6	.8	4.9	5.1%	16.3%	31.4%
KEYDATA CORP.	JULY 31, 1976	14.9	1.2	4.3	8.0%	27.9%	28.9%
COMSHARE INC.	JUNE 30, 1976	13.8	1.3	5.6	9.4%	23.2%	40.6%
ON-LINE SYSTEMS	APRIL 30, 1976	12.0	1.4	7.2	11.7%	19.4%	60.0%
ANACOMP INC.	JUNE 30, 1976	12.9	1.6	4.5	12.4%	35.6%	34.9%
COMPUSERVE	DECEMBER 31, 1976	11.4	1.6	5.6	14.0%	28.6%	49.1%
TOTAL		\$99.5	\$9.2	\$36.4	9.2%	25.2%	36.6%

(\$ MILLIONS)

* RETURN ON REVENUE (GROSS MARGIN) = INCOME BEFORE TAXES AND EXTRAORDINARY ITEMS / REVENUES

** RETURN ON EQUITY = INCOME BEFORE TAXES AND EXTRAORDINARY ITEMS / TOTAL STOCKHOLDER'S EQUITY

EXHIBIT II-5

COMPOSITE PERFORMANCE OF SELECTED GROUPS OF
COMPUTER SERVICES COMPANIES

FISCAL YEARS 1974, 1975 AND 1976

COMPANY SIZE (ANNUAL REVENUES)	FISCAL YEAR	TOTAL REVENUE	INCOME BEFORE TAXES AND EXTRAORDINARY ITEMS	STOCKHOLDER'S EQUITY	RETURN ON REVENUES	RETURN ON EQUITY	EQUITY AS A % OF REVENUES
SALES OVER \$100 MILLION	1974	\$ 447.5M	\$ 59.0M	\$202.9M	13%	29%	42%
	1975	513.6M	70.0M	205.8M	14%	34%	39%
	1976	540.8M	81.5M	242.8M	13%	33%	40%
TOTAL		\$1501.9M	\$210.5M	\$651.5M	14%	32%	43%
SALES FROM \$20— \$100 MILLION	1974	\$ 159.8M	\$ 16.3M	\$ 80.8M	10%	20%	51%
	1975	177.6M	24.7M	95.3M	14%	26%	53%
	1976	216.1M	26.4M	107.3M	12%	25%	50%
TOTAL		\$ 553.5M	\$ 67.4M	\$283.4M	12.2%	24%	51%
SALES LESS THAN \$20 MILLION	1974	\$ 67.6M	\$ 7.0M	\$ 22.6M	10%	31%	33%
	1975	84.2M	9.1M	29.5M	11%	31%	35%
	1976	99.5M	9.2M	36.4M	9%	25%	37%
TOTAL		\$ 251.3M	\$ 25.3M	\$ 88.5M	10%	29%	35%

III. MARKET ANALYSIS
AND FORECAST

III MARKET ANALYSIS AND FORECAST

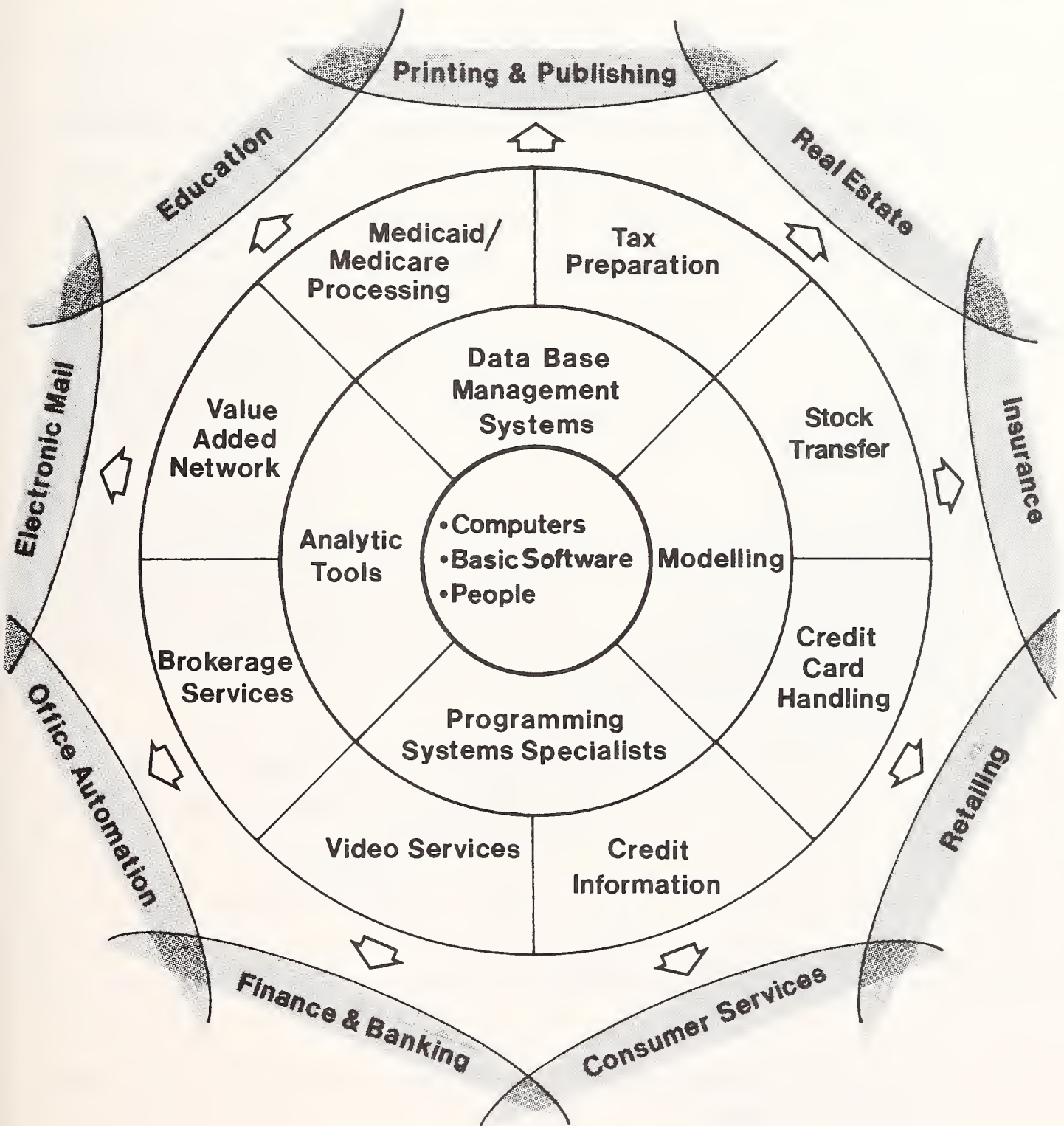
A. COMPARISON WITH GNP AND EQUIPMENT GROWTH

- With 1976 revenues of almost \$6 billion, the computer services industry has emerged from a 'startup' to an established industry in 10 years.
- Quality opportunities for investment and participation derive, in part, from the high comparative growth rate of industry revenues. This growth stems from a variety of factors:
 - Breadth of products and services available from computer services organizations. Virtually every company of any size in the U.S. is a target for computer services companies. AT&T is a large user of remote computing services (estimated at \$70 million per year) as are many one-person CPA firms which use computerized tax and financial statement preparation services.
 - Computer services are bought by companies with and without their own computers. Internal data processing departments tend to concentrate on 'mainline' applications providing numerous secondary processing opportunities. Thus, the increasing backlog of work at most EDP installations provides an opportunity to use services alternatives.

- The proliferation of minicomputers is creating a rapidly growing market for software packages and professional services; hardware by itself accomplishes nothing; software is needed to make it work, and it is not available from the manufacturers to the extent needed.
 - Services companies can often provide solutions to problems that might take years to develop in-house.
 - Whole areas of EDP use have been virtually created by computer services companies; for example, the stock market data base services used in the investment community and the econometric services available to economists and planners.
 - While computer services vendors will continue to provide specialized computer tools and skills which many organizations cannot afford individually, they will also expand into areas which, although computer dependent, are not normally considered computer services. Early examples include Bradford National's involvement in banking, Electronic Data System's acquisition of an insurance company, and Control Data's strong thrust into education. This broader growth is shown graphically in Exhibit III-1.
- As a result, INPUT forecasts U.S. computer services revenues will grow at a 16% average annual growth rate from 1976 to 1982. Although the forecast includes an assumed rate of inflation of 5%-7% over this period, the fact that many computer services companies are able to take advantage of price/performance changes in equipment, software, and communications means that the actual impact of inflation on them is less than this figure. Hence, INPUT forecasts real growth of over 10% per year.
 - Forecasts by various sources put the combination of real GNP and inflation growth in the 7%-10% range over the next 5 years. The computer services industry growth rate, then, is at least double the rate of growth of GNP (in current dollars).

EXHIBIT III-1

COMPUTER SERVICES EXPANSION INTO RELATED SERVICE INDUSTRIES



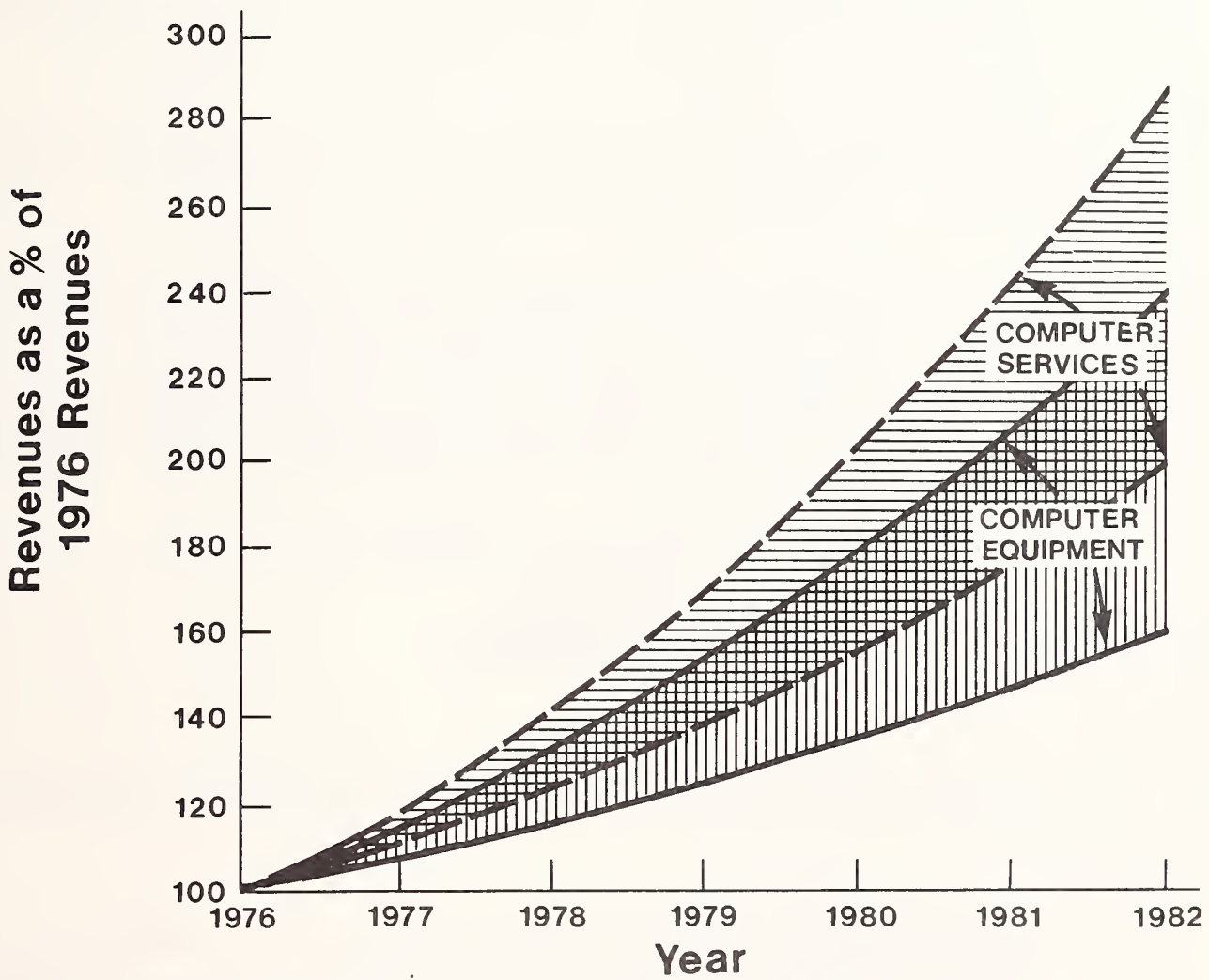
- Forecasts of computer equipment expenditures are often wrongly compared to those for computer services. For example, the U.S. Department of Commerce projects an 8% compounded growth rate from 1976 to 1985 for computer equipment including an allowance for inflation.
- The continuing improvement in the price/performance of all types of computer equipment is a major factor in this forecast. Overall performance of computer mainframes has been improving at a compound rate of 1.47 per year (INPUT study "Plug Compatible Mainframes: New Hardware Economics", June 1977). This performance improvement is offset by inflationary pressures on labor, material and other costs but still results in a net price/performance improvement. While this trend means current work can be processed less expensively, it also means that many cost/benefit thresholds will be crossed, encouraging more applications to be computerized. INPUT's projections of computer equipment growth range from 8% to 12% depending largely on the state of the general economy.
- INPUT's analysis of future spending patterns of large organizations in the U.S. (INPUT report "EDP Plans and Budgets", February 1977) showed that their expenditures for computer services increased by 16% from 1976 to 1977 within an overall EDP budget expenditure increase of only 10.2%. During this same period, equipment expenditures increased 11.6%.
- The relative growth of both hardware and services is shown in Exhibit III-2 which shows that services growth will lead that of computer equipment by a substantial margin over the next five years.

B. MARKET FORECAST BY ACTIVITY

- The principal components of the computer services market break down into three activity sectors:

EXHIBIT III-2

COMPARATIVE GROWTH RATES
COMPUTER HARDWARE AND SERVICES
1976-1982



- Processing Services where vendors' computers (or computers controlled by vendors) process work for clients; this includes interactive remote computing services (timesharing), remote batch services, conventional batch services, and facilities management.
 - Professional Services includes software development for clients' own computers and EDP related consulting services.
 - Software Products includes both applications and systems software packages sold (substantially unchanged) to multiple users.
- The market for all three taken together will grow from \$5.9 billion in 1976 to \$14.3 billion by 1982 as shown in Exhibit III-3.
 - The growth potential of a computer services firm is dependent to a degree on the type of service it offers. However, INPUT considers that it will be increasingly meaningless to categorize companies in this way. More important is the use to which services are put by the user, rather than how they are offered.

C. MARKET FORECAST BY TYPE OF SERVICE

- The processing services market is segmented by the types of applications provided:
 - General Business: Services done for users in many industries using common application packages to solve common business oriented problems such as taxes or perform standard transactions such as payroll.
 - Scientific and Engineering: Services relating to the solution of mathematically oriented problems, generally used by many industries.

EXHIBIT III-3

COMPUTER SERVICES INDUSTRY GROWTH
BY TYPE OF SERVICE
1976-1982

TYPE OF SERVICE	1976	1982	AVG ANNUAL GROWTH
REMOTE COMPUTING	\$1.8B	\$5.7B	21%
BATCH PROCESSING	1.6	2.4	7
FACILITIES MANAGEMENT	<u>.8</u>	<u>2.1</u>	<u>17</u>
TOTAL PROCESSING	4.2	10.2	16
PROFESSIONAL SERVICES	1.1	2.2	13
SOFTWARE PRODUCTS	<u>.6</u>	<u>1.9</u>	<u>21</u>
TOTAL MARKET	\$5.4B	\$14.3B	16%

(B=BILLION)

- Specialty Applications: Processing of applications (or functions) unique to an industry such as credit verification, trust-department accounting, and numerical control of machine tools.
 - Utility Services: Providing access to a computer and/or communication network with or without standard software "tools" enabling users to run their own programs. Included within Utility Services are data base management related services which are becoming increasingly important-growing at 36% per year and totaling nearly \$1 billion annually by 1981. (See INPUT study "Data Base Management System Services", August 1977).
- Exhibit III-4 shows the market growth for these classes of applications.

D. MARKET FORECAST INDUSTRY SECTOR

- Computer services companies must also be evaluated by considering the industry sector markets in which they operate. Industry-oriented marketing has long been one of IBM's major reasons for success. Recently, IBM has introduced industry specialized products such as point-of-sale and banking terminals. Many services companies are increasingly using this approach to provide specialty applications. In many cases, computer services companies have adopted marketing and product strategies somewhat akin to General Foods in their product management approach. Examples are:
 - Numerical control of machine tools and computer aided design for manufacturing companies (University Computing Company).
 - Travel agency services (Tymshare).
 - Driver and vehicle scheduling for motor freight companies (Itel).

EXHIBIT III-4

PROCESSING SERVICES MARKET FORECAST
BY APPLICATION
1976-1982

TYPE OF APPLICATION	1976	1982	AVERAGE ANNUAL GROWTH 1976-1982
GENERAL BUSINESS	\$.6B	\$ 1.4B	14%
SCIENTIFIC & ENGINEERING	.4	.8	12
SPECIALITY APPLICATIONS	2.2	5.7	17
UTILITY	1.0	2.3	15
TOTAL	<u>\$4.2B</u>	<u>\$10.2B</u>	<u>16%</u>

(B=BILLION)

- Trust accounting services for banks (Bradford National and Sun Information Services).
 - Patient record-keeping and billing for hospitals and clinics (Shared Medical Systems and McDonnell Automation).
 - Credit handling for retail stores (TRW).
- A major opportunity for services in the health insurance sector will derive from National Health Insurance (NHI), which should pass Congress in some form by late 1978. INPUT estimates that NHI will result in EDP expenditures in 1980 of between \$667 million and \$1.2 billion depending on which NHI program is implemented. (INPUT study, "Computer Services Markets in the Government Funded Health Insurance Industry", January 1977).
 - The relative size and growth rates of computer services markets by industry sector is presented in Exhibit III-5. These are particularly relevant when analyzing companies with strong industry specialization such as EDS (insurance), Martin-Marietta Data Services (manufacturing), TRW Data Systems (retail), and Reynolds & Reynolds (automotive dealers).

E. INDUSTRY GROWTH MODEL MATRIX

- Given the projected growth rates of each segment of the industry, a simple but useful "growth model" can be developed for an individual company. This can be done by cataloging the types of business in which the company is engaged, projecting the growth of each type, then aggregating the results. This composite model will approximate the potential growth rate of the markets in which the company participates. The model can then, of course, be further refined by including factors relating to the size of the company, profitability history, and management's track record.

EXHIBIT III-5

COMPUTER SERVICES MARKETS SIZE AND GROWTH RATE
BY INDUSTRY SECTOR

INDUSTRY	PORTION OF TOTAL 1976 MARKET	AVERAGE ANNUAL GROWTH 1976-1982
MANUFACTURING	22%	15%
TRANSPORTATION	2	16
UTILITIES	4	14
DISTRIBUTION	12	14 WHLS. 17 RET.
BANKING AND FINANCE	19	17
INSURANCE	7	12
MEDICAL	6	18
EDUCATION	2	14
GOVERNMENT	16	17 FED. 17 S & L.
OTHER	10	18
TOTAL MARKET	100%	16%

1976 TOTAL REVENUES \$5.9 BILLION

- The model matrix is given in Exhibit III-6, which gives the growth rate of each industry segment by type of application served. From this chart it can be seen that the highest growth potential would reside in a company doing remote processing of general business applications, whereas the lowest growth can be expected from a batch company specializing in scientific and engineering applications.
- In the computer services industry, few large companies devote all their resources to a single market or a single product. Although there are large companies in the computer services business that emphasize a single business such as Electronic Data Systems (in facilities management), the majority derive their revenues from a combination of businesses, usually unique to each company. Most companies provide a blend of products and services directed to one or more horizontal or vertical markets, addressing those segments where that very uniqueness provides a high profit margin potential.

F. MARKET AND COMPETITIVE TRENDS

I. BATCH PROCESSING

- The oldest and most fragmented sector of the processing business, batch processing, accounted for 38% of the 1976 user expenditures for processing services. Included in this sector are keypunch services, computer output microfilm (COM) services and payroll services.
- Traditionally, batch services were bought by small companies who could not afford their own in-house computer or by small geographically dispersed facilities of larger corporations.
- The continuing decline of the price of small business computers is increasing the competitive pressure on the small batch service bureau. These firms, often small and undercapitalized, are losing many accounts to this new competitive threat.

EXHIBIT III-6

COMPUTER SERVICES INDUSTRY GROWTH MODEL MATRIX

1976-1982

AVERAGE ANNUAL GROWTH RATES

APPLICATION	TYPE OF SERVICE						
	REMOTE COMPUTING	FACILITIES MGMT.	BATCH PROCESSING	TOTAL PROCESSING	SOFTWARE PRODUCTS	PROFESSIONAL SVCS.	TOTAL
GENERAL BUSINESS	23%	19%	8%	14%			
SCIENTIFIC & ENGINEERING	16	9	0	12			
SPECIALTY	21	19	9	17			
UTILITY	21	16	2	15			
TOTAL	21%	17%	7%	16%	21%	13%	16%

- INPUT's report, "Small Business Computers: Their Impact on Processing Services," shows some of the common methods used to compete with the small business computer:
 - Offering remote batch services.
 - Becoming a distributor of small business computers.
 - Providing turnkey services.

Since many small service bureaus are undercapitalized, often the only alternative is to become acquired by a larger and stronger company. Thus, the trend towards consolidation has been accelerated in the service industry. The most desirable acquisition candidates possess (generally) a solid customer base and/or some unique software products which the acquiror can market through a nationwide (or international) sales network or through multiple batch service centers.

- Despite competitive pressures, the dollars spent on batch services have been growing, partly as a result of the marketing efforts of large efficient companies who have acquired the customer bases of many of the smaller less efficient service bureaus. Companies such as Itel, Tymshare, Comshare and Automatic Data Processing who offer full, competitively priced services are outstanding examples.
- Vendors are now offering their customers a spectrum of services, including low-priced processing performed on fully amortized equipment, on-line services, and on-site computers. Confronted with the economics, the user frequently decides he doesn't need to have all his data processed instantaneously and may stay with the batch service.

2. REMOTE COMPUTING SERVICES (RCS)

- This is the fastest growing segment of the industry, and the one undergoing the most significant changes and pressures.
- RCS is comprised primarily of companies who emerged in the late '60s when simultaneous access to a computer became technically feasible. In less than 10 years, these companies have grown from offering local scientific and engineering problem solving using the 'Basic' programming language on slow teletype terminals, to multi-national firms capable of solving highly complex problems using programmable high speed terminals, satellite computers, and multi-computer networks.
- The modes of delivering a service, which used to be quite distinct, such as interactive problem solving, remote batch and data base inquiry are merging and becoming less distinguishable as users solve large and more complex problems requiring more than a single processing mode. Thus a user may enter data remotely, merge it with data from an existing data base, manipulate it, change and test parameters interactively, and finally run it on a remote batch basis.
- As large users incorporate more programmable terminals and minicomputers into their in-house systems, the role and the function of remote processing will continue to change and evolve.
- Some important factors affecting the market will be:
 - How IBM and other manufacturers support their systems, particularly in the data base area.
 - The capability and cost of value added network services. (See INPUT study "Value-Added Network Services", January, 1978).

- The quality and quantity of system and applications software available on minicomputers.
- The roles of AT&T and IBM in network and remote computing services.
- The aggressiveness and imagination of the current RCS vendors.
- The willingness and ability of the RCS vendors to provide processing services on a transaction-priced basis using the network and computers as tools.

3. FACILITIES MANAGEMENT (FM)

- The concept of facilities management is evolving from the total responsibility of managing a customer's computer on-site to total responsibility for performing parts or all of a customer's EDP function, on-site or off-site.
- The work is often entered through a remote batch terminal, processed and returned the same way. The major difference between remote batch and off-site FM is the duration of the contract (FM contracts are usually for 3 or more years) and the ultimate responsibility to insure that the processing will produce the results contracted for.
- Industries which have most heavily utilized FM are government, health insurance and banking. The three strongest motivating forces have been: 1) The fact that because of the uniformity of processing requirements, an experienced EDP vendor could perform the work more efficiently and at a lower cost; 2) The low salary structure and geographic dispersion of certain industries makes it difficult for them to attract or retain competent computer-skilled personnel; and 3) The importance of EDP to the success of the enterprise such that the factor of accomplishment overrides a predisposition to do it in-house (e.g., NASA's Apollo Program, check processing for banks).

- There will be a continuation of this trend as new technology requirements are imposed on certain industries. As an example, the large savings and loan institutions are now almost fully on-line. Another concerns small and medium size banks who must implement on-line services to remain competitive. Some of these who don't have the internal technical resources are using FM vendors with off-site facilities to implement their network.

4. PROFESSIONAL SERVICES

- The major market influence on this sector is the government. As long as government policy dictates the need for outside help, this sector will prosper.
- A second important factor is that it is easier for computer services firms to attract and retain competent people than it is for an organization for whom EDP is simply a functional area. Computer companies promote computer professionals while banks promote bankers.

5. SOFTWARE PRODUCTS

- A major reason for the flourishing of the software products sector is IBM's inability to be all things to all people. For example, weaknesses and inefficiencies in IBM's IMS data base management system have opened the door to a wide array of competitive products such as MRI's System 2000 and Mathematica's RAMIS.
- As technology improves and the influence of EDP extends into new nooks and crannies within the business establishment, new markets for new applications packages open up.
- The major inhibiting factor to growth in applications packages is a perceived user belief in the singularity of his problem.

- With more efficient software development tools (such as data base management systems) becoming available, it is becoming easier for the applications package vendor to "tailor" the package to individual need. With this particular problem dealt with, the biggest problem the application specialist has is marketing. Today, most packages are provided by small companies who do not have the distribution and service facilities they need to adequately leverage their products. A continuing trend in the industry is toward absorption of these small firms into the bigger ones who have the necessary marketing strength.

IV. EVALUATION CRITERIA

IV EVALUATION CRITERIA

A. FINANCIAL STATEMENTS

- In this section, composite "norms" for several different financial evaluation parameters are established. These can be used to roughly estimate how a company under study compares to other successful companies in the industry. In applying these figures, the analyst must consider that the business mix of a given company may be unlike that of others and the norms may not be directly applicable.
- To establish these norms, INPUT chose five companies in each of two size categories:
 - Category I, companies with from \$10 to \$20 million annual revenues in 1977.
 - Category II, companies with more than \$20 million annual revenues in 1977.

All of the selected companies derive most of their revenues from processing services. This was done for three reasons: First, because processing services dominate the industry; second, because there are too few large public companies operating in either the professional services or software product areas to develop meaningful statistics; and third, because most of the public companies of interest to the analyst have at least a major portion of their business in processing services.

- The companies selected are all successful firms who have compiled good growth and profit records in recent years. They are:

Category I

Anacomp
CompuServe
Comshare
On-Line Systems
Rapidata

Category II

Automatic Data Processing
Electronic Data Systems
National Data
National CSS
Tymshare

- Exhibits IV-1 and IV-2 give composite financial statistics for Category I and Category II companies respectively. These figures were compiled from information available in 10K reports and in each case the fiscal year figures were used. Thus, a company whose fiscal year ended in February 1977, had its data added to that of another company whose fiscal year ended in June 1976. Therefore, the data could be skewed from one firm to another by as much as nine calendar months.
- Definitions of some of the terms used in Exhibits IV-1 and IV-2 are as follows:

$$\text{Return On Revenues} = 100 \times \frac{\text{Income from operations}^*}{\text{Revenues}} \%$$

$$\text{Operating Return On Equity} = 100 \times \frac{\text{Income from operations}}{\text{Stockholder's equity}} \%$$

$$\text{Revenue To Equity Ratio} = \frac{\text{Revenues}}{\text{Stockholder's equity}}$$

* Does not include interest

EXHIBIT IV-1
 COMPOSITE FINANCIAL DATA
 CATEGORY I COMPANIES
 (\$10-\$20M REVENUES)

PARAMETER	FISCAL 1975	FISCAL 1976	CHANGE 1975 - 1976
REVENUES	\$55.9M	\$65.7M	+18%
INCOME FROM OPERATIONS	\$ 8.8M	\$ 7.4M	-16%
RETURN ON REVENUES	16%	11%	
STOCKHOLDERS EQUITY	\$22.6M	\$32.5M	+44%
OP. RETURN ON EQUITY	39%	23%	
REVENUE TO EQUITY RATIO	2.5	2.0	-20%
TOTAL ASSETS	\$51.9M	\$54.9M	+6%
OPERATING RETURN ON ASSETS	17%	13%	
CURRENT RATIO	1.2	1.3	+8%
CASH FLOW ON OPERATIONS	\$10.4M	\$10.9M	+5%
CASH FLOW RETURN ON REVENUES	19%	17%	
NET EARNINGS	\$ 5.4M	\$ 4.5M	-17%
STOCKHOLDER RETURN ON EQUITY	24%	14%	
NUMBER OF EMPLOYEES	N/A	1,456	
REVENUES PER EMPLOYEE	-	\$45,124	

(M = MILLION)

EXHIBIT IV-2
 COMPOSITE FINANCIAL DATA
 CATEGORY II COMPANIES
 (OVER \$20M REVENUES)

PARAMETER	FISCAL 1975	FISCAL 1976	CHANGE 1975 - 1976
REVENUES	\$409.9M	\$477.3M	16%
INCOME ON OPERATIONS	\$ 71.0M	\$ 83.9M	18%
RETURN ON REVENUES	17%	18%	
STOCKHOLDERS EQUITY	\$205.5M	\$243.1M	18%
OP. RETURN ON EQUITY	35%	35%	
REVENUE TO EQUITY RATIO	2.0	2.0	
TOTAL ASSETS	\$284.6M	\$334.7M	18%
OPERATING RETURN ON ASSETS	25%	25%	
CURRENT RATIO	2.5	2.7	8%
CASH FLOW FROM OPERATIONS	\$ 59.0M	\$ 68.3M	16%
CASH FLOW RETURN ON REVENUES	14%	14%	
NET EARNINGS	\$ 37.6M	\$ 43.1M	15%
STOCKHOLDER RETURN ON EQUITY	18%	18%	
NUMBER OF EMPLOYEES	12,150	13,920	15%
REVENUES PER EMPLOYEE	\$33,736	\$34,289	2%

(M = MILLION)

$$\text{Operating Return On Assets} = 100 \times \frac{\text{Income from operations}}{\text{Total assets}} \%$$

$$\text{Cash Flow On Operations} = \text{Cash flow before extraordinary items}$$

$$\text{Cash Flow Return On Revenues} = 100 \times \frac{\text{Cash flow on operations}}{\text{Revenues}}$$

- Revenues per employee are an important indicator in most services companies. The average shown in the Category II data, however, can be misleading. Automatic Data Processing, which has an outstanding record, averages only about \$30,000 per employee because its business mix has a heavy data entry content which means they have a large number of low-salary employees. National CSS and Tymshare, whose business is almost exclusively remote computing services, average nearly \$55,000 per employee.
- Exhibit IV-3 contains a listing of quarter-by-quarter revenues and earnings for seventeen public firms.

B. OTHER PARAMETERS

- In addition to determining if a company is participating in rapidly growing market sectors, (See Chapter III), and analyzing the company's financial statement, other items to be considered are:
 - Market share.
 - Product uniqueness.
 - Number of customers.
 - The network (for processing services companies).
 - Acquisition policies and programs.
 - Contract mix.
 - Business strategies.

EXHIBIT IV-3

REVENUES AND EARNINGS GROWTH FOR PUBLICLY HELD COMPUTER SERVICES COMPANIES

COMPANY	FISCAL YEAR END	1975 REVENUES#	CALENDAR YEAR 1976				TOTAL#	GROWTH RATE '75 - '76	CALENDAR YEAR 1977		GROWTH RATE 1ST Q '76 - '77	GROWTH RATE 2ND Q '76 - '77
			1Q	2Q	3Q	4Q			1Q	2Q		
ANACOMP	R 6/30	\$ 11,517	3,475	3,463	2,929	3,285	13,152	14%	4,729	5,240	36%	51%
APPLIED DATA RESEARCH	E 12/31	12,738	232	267	233	295	1,027		351	320	20%	20%
AUTOMATIC DATA PROCESSING	R 6/30	169,038	3,331	3,901	3,934	4,596	15,762	24%	4,489	5,136	35%	32%
BRADFORD NATIONAL	E 12/31	58,144	333	423	381	303	1,440		338	407	0	(4%)
BRANDON APPLIED SYSTEMS	R 2/28	6,181	50,438	52,359**	53,020	57,920	213,737	26%	61,934	64,554	23%	23%
COMPUERVE	E 12/31	8,462	4,700	5,146	4,608	5,605	20,059		5,918	6,650	26%	29%
COMPUTER NETWORK	R 3/31	6,496	15,473**	15,837**	15,478**	19,016**	65,804	13%	20,779	21,729	34%	37%
COMPUTER SCIENCES CORP	E 3/31	207,275	1,055	1,030	398	721	3,204		833	944	(21%)	(8%)
COMSHARE	R 6/30	13,241	938	1,929	1,640	1,660	6,167	0	2,550	2,389	172%	24%
ELECTRONIC DATA SYSTEMS	E 12/31	8,462	(309)	190	113	283	277		237	191	(23%)	0
KEYDATA	R 7/31	14,412	2,267	2,393	2,828	3,909	11,397	35%	3,199	3,469	41%	45%
NATIONAL CSS	E 2/28	34,194	223	218	301	453	1,195		342	301	53%	38%
NATIONAL DATA CORP	R 5/31	32,590	1,616	1,498	1,417	1,595	6,126	6%	2,839	3,377	76%	125%
ON-LINE SYSTEMS	R 4/30	10,694	231	184	82	126	623		198	319	(14%)	73%
RAPIDATA	E 12/31	14,772	61,910	55,541	57,943	58,093	233,487	13%	63,168	64,134	2%	15%
SYSTEM DEVELOPMENT	R 6/27	108,521	2,128	3,288	3,668	3,809	12,893		3,870	3,150	82%	(4%)
TYMSHARE	E 12/31	64,534	3,540	3,542	3,726	3,885	14,693	11%	5,365	5,237	52%	48%
TOTAL	E	899,747	573	185	346	473	1,577		653	418	14%	126%
			34,168	34,967	35,706	36,444	141,285	11%	43,352	48,686	27%	39%
			3,199	3,532	3,297	4,039	14,067		4,436	4,656	39%	32%
			3,801	3,731	3,542	3,621	14,695	2%	3,667	3,728	(4%)	-
			313	308	97	124	842		127	*	(59%)	-
			9,314	10,154	10,340	10,546	40,354	18%	10,663	11,547	14%	14%
			620	754	805	819	2,998		844	879	36%	17%
			8,110	8,245	8,447	8,291	33,093	2%	8,908	9,340	10%	13%
			577	579	505	547	2,208		615	673	7%	16%
			3,662	3,633	3,984	4,096	15,375	44%	4,288	4,318	17%	19%
			356	258	308	365	1,287		415	312	17%	21%
			3,844	3,714	3,925	4,141	15,624	6%	4,415	4,656	15%	25%
			278	5	47	181	511		167	298	(40%)	5,860%
			27,687	30,655	28,540	32,430	119,312	10%	33,248	36,000	20%	17%
			498	523	536	579	2,136		760	836	53%	60%
			23,375**	19,894**	19,002**	19,566**	81,837	27%	26,235	23,747	12%	19%
			2,474	1,598	1,180	1,460	6,712		2,621	2,227	6%	39%
			256,949	255,546	256,401	273,094	1,041,900	16%	303,828	317,287	18%	24%
			17,272	18,488	16,905	20,182	73,056		22,752	22,582	32%	22%

BASED ON CALENDAR YEAR NOT FISCAL YEAR ** RESTATED FIGURES (R (REVENUES)) = TOTAL REVENUES IN THOUSANDS
 * INFORMATION NOT AVAILABLE AT TIME OF ! EXTRAORDINARY ITEM REPORTED (E (EARNINGS)) = NET INCOME AFTER TAXES IN THOUSANDS



Summary information on the position of several companies is included in the final section of this report by industry/product area.

- Market share is an important long term parameter in the computer services industry. A substantial market share by product or industry provides a high degree of built-in protection from external forces and a solid base for expansion of services. For example, Shared Medical Services and McDonnell Automation dominate the market for administrative hospital computer services. Both companies are rapidly expanding their services and revenues into clinical areas with their existing clients while their existing administrative services are growing rapidly.
- Product uniqueness is the item that allows a company to charge a premium for a product or service. Some companies have been created on the strength of a single unique product; for example, Applied Data Research with its "Autoflow" program.
- A large number of customers means, of course, that a company can afford to lose a customer more easily than a company with its business concentrated in a few large customers. More than that, however, a large number of customers implies high marketing leverage. For example, Itel/Data Services has, according to a recent statement, over 13,000 customers. This large base provides a leveling influence, as well as an outlet for additional Itel services such as equipment leasing.
- The network is the distribution system for remote computing services. In order to take advantage of the benefits of new technology, to have the ability to buy whatever hardware is most advantageous, and to extend services into new geographic areas, the network must be flexible and capable of interconnecting varied devices.

- As noted earlier in this report, acquisitions will be a key to continued growth in many successful companies. While many successful intermediate-sized processing companies have already been acquired, such as Cyphernetics (ADP), Computer Dimensions (Itel), and United Data Centers (Tymshare), there are others available, particularly specialist companies. In addition to stock valuation, cash availability is important for acquisitions. Exhibit IV-2 shows that the ability to generate cash is characteristic of successful services firms.
- The mix of contracts is another key parameter. Companies that have a large percentage of their business derived from multiple-year long-term contracts are obviously less exposed to competition than those that have the majority of their business in 30-day cancelable contracts. Long term contracts also permit better personnel, facilities and profit planning.
- Lastly, a company's business strategies should be considered. Listed below is a useful check list of ten "keys" which have proven to be successful strategies for many of the industry's leaders. INPUT does not imply that all of these are necessary for success. However, good investment prospects are likely to employ at least half of these strategies:

INPUT has observed, then, that high-growth, profitable companies...

1. Remain at the forefront of technology by working closely with equipment and software vendors.
2. Provide integrated service capability not tied to a single manufacturer, or type of hardware; this maximum flexibility approach enables a company to choose and use the hardware and software most appropriate for the job.
3. Concentrate on specific industries, applications and functions so that expertise is foremost in those areas.

4. Carefully select areas of specialization; the costs of specialization are high and thinly spread resources are an invitation to failure.
5. Emphasize services to industries where efficient information management is an essential part of the competitive posture of the companies in those industries.
6. Concentrate primarily on rapidly growing domestic markets, but use overseas markets to leverage successful products developed for the domestic market.
7. Obtain a larger segment of the "EDP pie" by deeper penetration of customer's mainstream business activities.
8. Provide distribution of services through networks and use of computer and terminal hardware which is appropriate to user needs.
9. Put top priority on recruiting, training, and motivating skilled personnel; computer services is a 'people dependent' business.
10. Have an active acquisition program that can successfully attract quality companies, retain talent, and tap new markets.

V. DRIVING FORCES AFFECTING
COMPUTER SERVICES

V DRIVING FORCES AFFECTING COMPUTER SERVICES

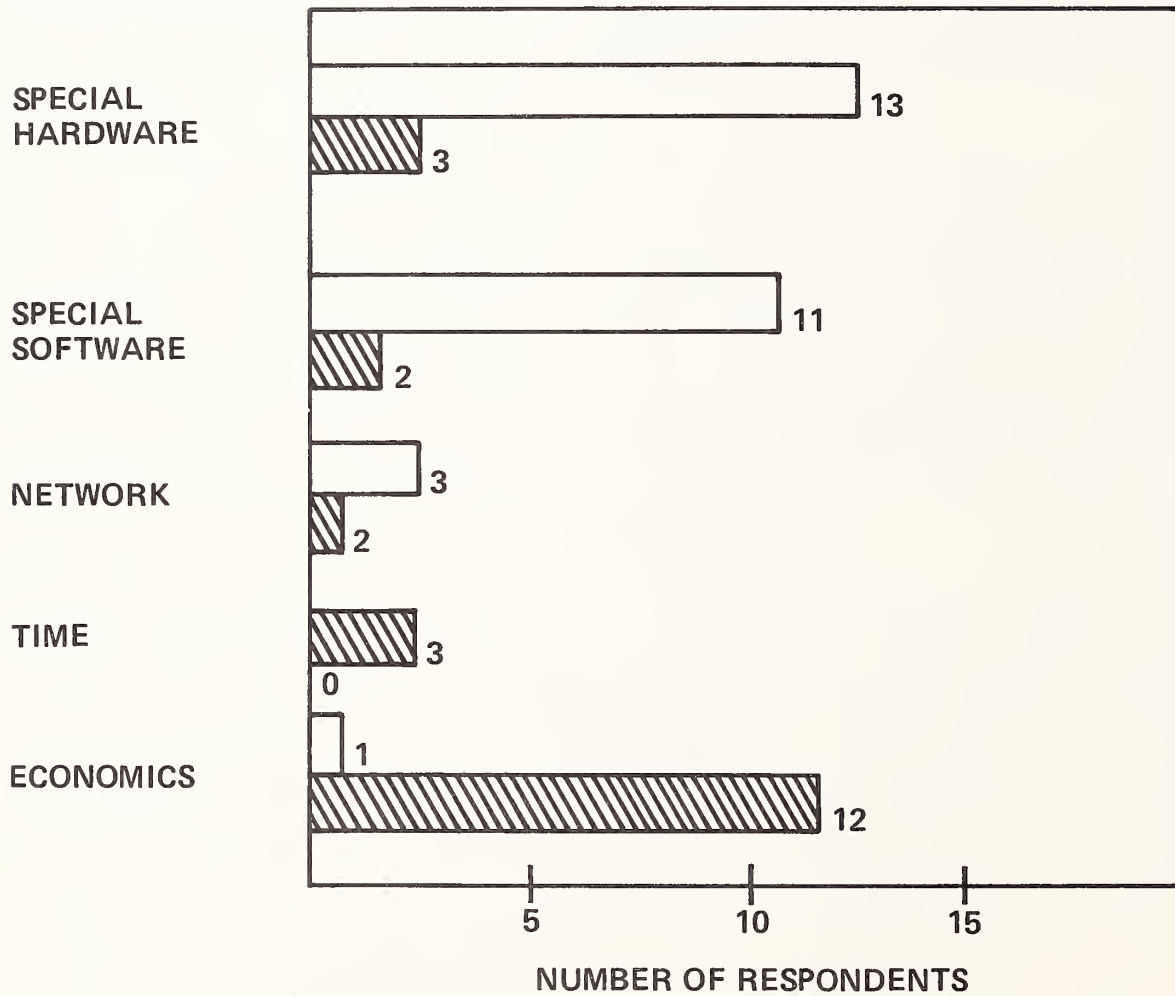
A. WHY PEOPLE BUY COMPUTER SERVICES

- Reasons for the purchase of even the same type of service vary considerably by the size and type of the organization. For example, the results of a survey INPUT carried out on the purchase of a remote computing service are shown in Exhibit V-1. Directly or indirectly, economics is the primary reason for choosing services. An organization often cannot justify the acquisition of the necessary hardware, software, people and network capability to do a particular job itself.
- As the hardware and software available from computer manufacturers have advanced, some of the justification trade-offs have changed. Hence, the establishment of in-house timesharing in some large companies, which has inhibited some of the market for remote computing services. On the other hand, services vendors have expanded their product line from simple access to a timesharing computer to the provision of a broad range of value-added services. Proprietary software such as PROPHIT from Control Data, powerful data base management languages such as ALADDIN from Computer Sciences and MAGNUM from Tymshare, and proprietary data bases such as those available from Intel's AUTEX, have resulted in services which are much more difficult to emulate or replace in-house.

EXHIBIT V-1

SURVEY OF REASONS FOR USING A
REMOTE COMPUTING SERVICE

REASON FOR USE



□ RESPONDENTS WITH LARGE IN-HOUSE COMPUTER INSTALLATIONS

▨ RESPONDENTS WITH SMALL OR NO IN-HOUSE COMPUTER INSTALLATIONS

- As far as software or a specialized processing service is concerned, in-house EDP departments may lack the necessary expertise to develop and operate an equivalent system. One purchaser of systems development capability said recently "the services company's people have implemented the type of system I want in a dozen companies." As computer services vendors increase their range and experience, this 'expertise' factor becomes more important.
- A second major factor is 'time'; often a computer services vendor can save years over an in-house development.
- In every aspect of contemporary American society, people (especially those who run businesses) are constantly faced with decisions on whether or not to 'do it for oneself' or 'have someone else do it'. The fact is that both types of people exist and are likely to continue to exist. In the computer industry, the services company is the non-do-it-yourselfer's best friend. As long as these people exist, there will be a built-in demand for computer services that no amount of hardware sophistication will remove.
- Two key questions facing the industry are: 1) are the do-it-yourselfers gaining?, and 2) if so, how fast? Much of the current body of available information appears to support the following statements:
 - There are stable groups on either side.
 - Emotion frequently triumphs over logic.
- Computer services vendors will continue to provide, therefore, equipment facilities, software, and skilled personnel which individual organizations cannot acquire now because of time, cost and availability factors. INPUT concludes that the future demand for services will continue to exist at least in the same ratio as it does today.

B. INCREASING DEMAND FACTORS

- The value of having information available when and where it is needed for decisions is increasing throughout business and government. Often the precise nature of the information alters with time. These changes in the 'time-value' of information will increase the demand for both internal systems and computer services.
- Secondly, information processing is becoming more complex. The number of choices facing the data processing user as to suppliers of terminals, computer mainframes, software, communications, etc. is increasing. Also, the user must decide how to piece together the various options in such terms as 'dumb' or 'intelligent' terminals, minicomputers, maxicomputers, or both, centralized or decentralized operation, etc. In this environment, few organizations have the resources to put the pieces together in the most economical manner. Among those that do are the computer services companies.
- There are several management trends within organizations which INPUT foresees will benefit computer services. Perhaps most importantly, trained managers are taking over data processing rather than data processing people moving into management. As a consequence, decisions which favor the expansion of in-house data processing empires regardless of alternatives will decrease. The data processing department within an organization will increasingly be regarded and managed as a production facility with all the 'make/buy' analyses that are customarily carried out in other parts of an organization.
- Furthermore, INPUT expects that many of the present monolithic in-house data processing organizations will begin to break up in the early 1980s. As the number of decision points for the acquisition of information processing products and services expands so will the opportunities for services companies, not only for data processing, but for word processing and communications-the total information processing spectrum.

- Also, users now know what can be obtained from computers and how to get it. EDP departments are thus faced with users who are knowledgeable and demand that their needs be met, or they will look elsewhere. Computer services will in many cases, be used to fill the gap between supply and demand.
- Finally, computer services companies often 'create' new EDP dollars by satisfying new requirements. An example of this is the development of the market for financial and economic forecasting data bases (See INPUT report "Remote Computing Services Markets for Economic and Financial Data Bases", January 1977).

C. CHANGES IN COMPUTER HARDWARE COSTS

- The 'New Hardware Economics' described by INPUT in a 1977 report will provide computer services companies with both opportunities and challenges. Some forecasts contained in the report are:
 - 10 times price/performance improvement over an IBM System 370/168 by 1985.
 - On-line disk storage to cost less than .0005 cents per bit by 1985 (one billion bytes for \$40,000).
 - Storage and retrieval of information will be cheaper to handle electronically than on paper by 1985.
 - More rapid improvements in large system price/performance ratios in throughput, storage and processing power than in small and medium systems.

- For computer services companies, the performance characteristics of the new computers such as the IBM 3033 and Amdahl 470/V7 provide a large increase in capacity for less cost than earlier machines.
- The utility processing market will become increasingly price competitive because of these price/performance changes. Also, the increased capacity that many users will have with these computers will be beyond their immediate needs. Thus, in 1979 and the early 1980s 'raw time' will be sold by many of them at 'cost recovery' rates. It is the specialized services, the software and data base dependent services, and the people dependent packaging of computer/communications facilities, which will provide the continuing revenue and profit growth for the processing services companies.
- Today the major expense item for computer users is application program development. IBM and others will increasingly attempt to replace costs in this area with hardware and software tools. This provides a major opportunity for major computer services companies who are able to provide better program development tools and sophisticated applications packages.
- As hardware becomes less expensive, terminals will be available everywhere. Users outside data processing will have their own application development requirements and will satisfy them through easy-to-use languages and tools. Price, flexibility, and reliability will be their major concerns -not the system they are plugged into.

D. IMPACT OF SMALL COMPUTER SYSTEMS

- Frequent statements are made concerning the 'battle' between minicomputers and services. There are losses of computer services clients to in-house small computers, but there are also counter-balancing business increases through their use. As INPUT analyzed in a 1977 research project "Small Business Computers: Their Impact on Services".

- 35% of new small business computer users previously used batch services, primarily general business applications such as payroll.
 - Users spending from \$1,000 to \$2,000 per month are prime targets.
 - Detailed cost comparisons are rarely performed.
 - 'Poor service' is often the initial reason for users considering switching.
 - Processing services vendors generally report less than 10% of lost business is lost to small business computers.
- On the other hand, computer services companies are now obtaining significant revenues (in some cases far greater than losses) by:
 - Providing software packages and consulting services.
 - Distributing small computers to customers as turnkey systems.
 - Using small computers as intelligent terminals which can do stand-alone processing and also be connected to networks for special applications.
- New minicomputer based systems will drive the threshold at which processing services users will consider their own computer from \$1,000 per month to \$500 per month or less. (In this context Heathkit in association with DEC is now making available a small system for about \$3,000). Processing services users with the following characteristics are susceptible to a small computer:
 - Primarily perform standard accounting applications and/or a single specialized application.
 - Single location.
 - Stable in size and nature of products and/or markets.

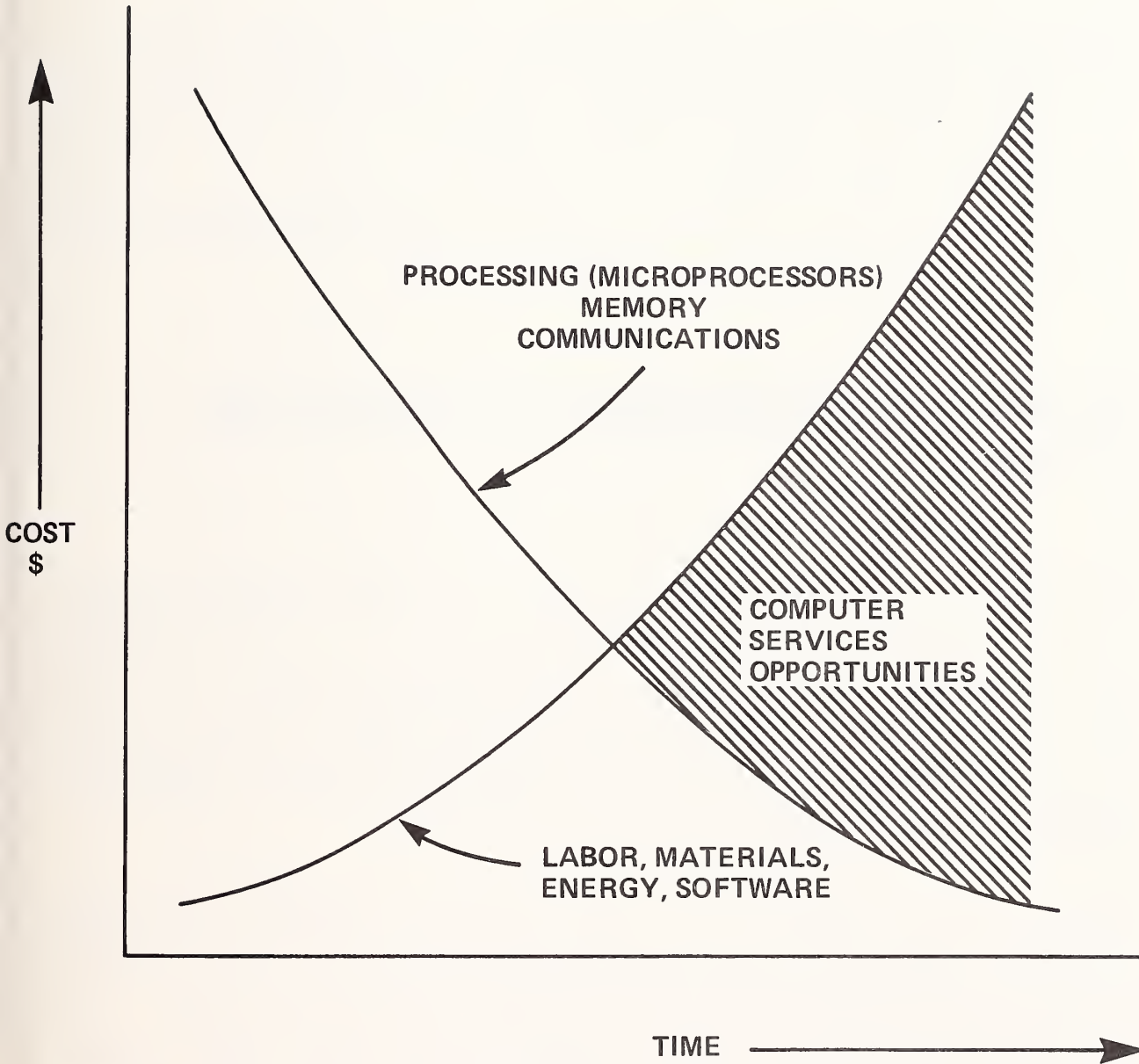
- In other environments, particularly where there is a great deal of change, larger processing and storage requirements, or network requirements, processing services companies will prosper because they can offer software and support through networks.
- Terminal development will benefit services companies:
 - Very cheap, simple terminals (\$20 per month) will be available, thereby, lowering entry thresholds.
 - Intelligent terminals and minicomputers will be indistinguishable.
 - Conversion of typewriters to text processors and general-purpose terminals will remove a cost barrier and increase the number of services buyers for text processing and other applications.
- "Distributed processing" is not here yet; only 5% of small computer installations are operated in a communications environment of any kind. By providing the communications networks and software support for distributed small computers, computer services companies will be able to compete on more favorable terms with in-house EDP installations in larger companies.
- INPUT forecasts that the reduction of hardware cost and proliferation of computers will have a net positive impact on computer services markets. In the long term, the solution is the "value added", which will produce growth in revenues and profits in the computer industry. The net positive effect of changing cost relationships is shown graphically in Exhibit V-2.

E. COMMUNICATIONS

- The establishment of value added networks (VANS) such as those now operated by Tymnet and Telenet, will provide computer services vendors with a way of

EXHIBIT V-2

CHANGING COST RELATIONSHIPS



expanding their geographic coverage without the costs and delays of network expansion. These networks will act as a delivery mechanism for the vendors' products. Major users of VANS are computer services companies such as Data Resources, Inc. and Scientific Timesharing.

- Over the next 5 years data communications costs will decrease. Thus, it will become increasingly economical to collect and disseminate information through networks. Computer services companies with the ability to package the communications, software, and equipment will benefit from this trend. Communications-related systems development will provide a large market for professional services and software products.

F. INFORMATION PROCESSING SERVICES: THE MERGER OF TEXT AND DATA

- The number of potential computer terminals will increase rapidly in the next 5 years. Text processing devices installed in offices, such as the IBM System 6 and Xerox 800, may be easily and inexpensively extended to be used as terminals. This provides a major opportunity for computer services companies to sell new products and services in the text area, as well as to expand their base for current services.
- There is also a proliferation of new equipment addressing input/output problems. 20,000 line per minute printers such as the IBM 3800 and Xerox 9100 are too expensive and powerful for all but very large companies. On the input side, voice input will become feasible during the early 1980s. Computer services vendors will be able, in the classic 'sharing' mode, to provide smaller companies with their benefits at acceptable costs.
- Other new equipment such as IBM's 46/40 ink jet printers can provide the means for electronic mail. With the cost of a first class letter projected at 38¢ by 1985, information transfer using such systems will be a new opportunity.

- The eventual installation of programmable PABX systems in offices, such as the system IBM has in Europe, should also provide opportunities for computer services companies to 'connect' with new users.
- A result of the developments in the office area will be the emergence of a large, new set of potential buyers of products and services. These are the people that computer services companies are much more used to dealing with than are the hardware vendors who are tied to EDP departments.

G. TREND TO CONSOLIDATION

- The investment required to fully develop new business opportunities in computer services will, in the future, be more substantial than it is today as the industry reaches out to solve increasingly complex problems. Thus, the current industry trend toward consolidation through acquisition and merger will continue. It is through this pooling of resources that companies will have the capital, personnel, and market distribution needed to deal with tomorrow's problems.
- Therefore, in 1982 there will be fewer companies than there are today. This does not, however, portend the end of the independent company. INPUT forecasts that independent companies, larger through internal growth and acquisition, will actually increase their market share to 56% in 1981 from their 54% share in 1976.
- While it is true that it will take more resources to fully develop and market a new product or service, it will still require less time and capital to establish a software consulting or development business than almost any other. Thus, there will continue to be new entrants into the market, ensuring a continuing supply of new ideas and products. In summary, the market will still be easy to enter, but success will be difficult to achieve without size.

H. IBM's ROLE

- Because of its dominance of the hardware segment of the computer industry and its strength in the computer services industry outside the U.S., IBM's actions in the U.S. market are particularly important. It is already a large software vendor in the U.S. but does not offer processing services here.
- The two events which have curtailed IBM's activities in the computer processing services business in the U.S. were: 1) the 1956 consent decree, when it agreed to a complete separation of the business of IBM and the Service Bureau Corporation (SBC); and 2) the settlement of the suit with Control Data Corporation in 1973 when IBM sold SBC to Control Data and agreed not to re-enter the computer processing services business in the U.S. until 1979.
- In the meantime, IBM's processing services in Europe, Canada and elsewhere have continued to grow and prosper.
- IBM has the resources and the capability to re-enter the computer processing services market in the U.S. with another separate entity like SBC. In re-entering the market, the company would have the advantage of being able to install its most up-to-date and best price/performance computing equipment. There would be no need to immediately develop a separate network. IBM could use existing value added networks and add Satellite Business Systems (SBS), IBM's joint venture with Aetna & Comsat, when it is ready to go into full service. The software developed in Europe and Canada could, in some cases, be adapted to the U.S. market.
- The initial effect on the market of IBM's entry would be (as it has in the past) to expand the market for the other computer services companies, for three reasons:
 - IBM's ability to effectively market and sell processing services to a broad customer base, thereby 'educating' a new population of users.

- The creation of 'plug compatible' processing services markets.
 - The admission that processing services are a viable alternative to 'doing it yourself'.
- In the meantime, IBM is becoming increasingly active in the software product marketplace. As the pressure increases on the profitability of the company from the plug compatible mainframe vendors, software will increasingly be considered as a separate business rather than an afterthought to the sale of hardware.
 - How strong IBM's competitive stance will be in this market may depend somewhat on the outcome of the current litigation against IBM. For example, if a consent decree is negotiated with the provision that IBM must provide complete software interface specifications on a timely basis, many software vendors could develop applications software products and the user would have a wider selection of software to choose from..
 - If, on the other hand, IBM wins its litigation and there is no consent decree, the impact on some parts of the industry could be severe. IBM could effectively build an electronic "security" fence around its hardware and software making it difficult for competitors to interface without IBM's consent.
 - The behavior of IBM in the Series/I market is atypical. Having announced a "bare bones" product, IBM has seemingly left the door open to systems houses, peripheral vendors, and software firms. However, IBM will only agree to maintain its own CPU and peripherals, leaving the user who has selected non-IBM peripherals to arrange for his own maintenance.
 - IBM will continue to innovate both through new hardware and new software. There will likely be a move to provide integrated hardware/firmware/software functional solutions dependent on the hosts' operating system software. This will be supported through remote and resident diagnostic routines as well as remote application system installation and development services.

I. THE FEDERAL GOVERNMENT

- The federal government is one of the most important external factors influencing the industry. The quoted budget for "commercial ADP" (Automatic Data Processing) is about \$4 billion annually. Its actual expenditures including DOD, NASA, and other specialized work is closer to \$14 billion annually.
- In 1976, INPUT estimated that federal spending for outside "commercial" computer services reached \$700 million. In 1977 this is expected to grow to \$840 million, a 20% increase over the prior year. This trend will continue because services are perceived as easier to control and budget for than in-house systems and easier to manage than in-house personnel. The cost of a government employee is so high today that outside programming personnel, for example, can be bought for less money than the burdened (salary + fringes) rates of government people.
- In today's political climate especially, services are a highly desirable alternative for federal procurement. They are strongly opposed, however, by federal employee organizations which are more concerned with building employment stability and new opportunities for their members than performance.
- Circular A76 encourages Federal government departments and agencies to go to the services industry to get their non-recurring computer needs met rather than purchasing computer systems and building internal EDP "empires". Therefore, it is now much easier for an agency of the government to obtain approval of a smaller expenditure to procure computer services than to go for a capital equipment budget to lease or purchase a computer system. With A76 in mind, GSA recently negotiated some 40 TPS (Teleprocessing Services) contracts with remote computing services companies. These contracts make it relatively easy for an agency to buy diverse services from a wide spectrum of companies.

- The government's effect on the computer services industry will also be major because of regulation and legislation.
 - Remote computing services could be partially regulated by the FCC (INPUT does not consider this probable).
 - Privacy and security legislation and regulation could create new markets and/or close others.
 - Rulings on software copyright, patentability and tangibility will all be pertinent for software sales and use.
 - Regulation on such matters as electronic mail and electronic funds transfer (EFTS) will also have a direct impact.

J. OVERSEAS MARKETS

- Because of the leveraged nature of the computer services industry, expansion into other countries is a natural avenue for obtaining additional revenues with minimal investment.
- American services companies are, with few exceptions, the only ones with the technological and marketing strengths needed to effectively exploit foreign markets. Firms such as Control Data Corporation, University Computing Company, Informatics, Tymshare, Comshare, General Electric, and Computer Sciences have made substantial inroads overseas (especially in Europe) and can be expected to continue growth in those markets.

K. PERSPECTIVE ON THE FUTURE

- With its 200,000 employees, the U.S. computer services industry has one of the largest pools of talented and creative people in the world. This group has

shown it has the ability to perceive opportunities for the application of technology in services and the skills to develop successful businesses. INPUT considers it likely that this collective creative force will continue to expand into new areas, many of which are not even envisioned today.

- As the industry is influenced by creative thought and competitive pressure, it is developing new business opportunities at a rapid rate. If one envisions the computer services industry as a series of concentric waves created by a stone thrown into still water, then one sees the following:
 - In the center are companies providing "raw time" only. Sometimes, these are EDP centers selling surplus time during off hours. Little or no software or support is provided.
 - The first wave contains a network, enabling users to communicate remotely with the computer through a terminal. The user does all of his own programming using only "utility" software.
 - The next wave contains the general purpose problem solving software and applications packages that cross industry lines.
 - As we approach the perimeter, the wave starts breaking up...industry and specialty applications are now being provided and an increasing amount of value is added to the service. The user becomes more and more dependent on the service which ultimately becomes an integral part of his business.
 - As the waves flatten out, the computer becomes an incidental tool to help provide the customer with new services. These services are often removed from the computer itself. For example: stock transfer services offered by Bradford; tickets to sporting events, concerts and the theater provided through Ticketron (a Control Data subsidiary); Computax, competing against H.R. Block; and others such as credit services (TRW), stock quotation services (Quotron), education services (Control Data), and health insurance (Optimum Systems).

- The present differentiation between services such as 'remote batch', and 'timesharing', will disappear in the 1980s, and be replaced by industry and functional specialization differentiation. Vendors will be viewed as specialists such as financial systems specialists or human resources specialists. It will not at all be surprising to see the word "computer" dropped from industry descriptions in ten years or less.

VI. MANAGEMENT COMMENTS

VI MANAGEMENT COMMENTS

- In order to provide an outside perspective in this report, INPUT asked the heads of several computer services companies to contribute their ideas. Ten organizations replied and their comments are displayed in this section.

SIGNIFICANT GROWTH FACTORS NECESSARY FOR A COMPANY COMPETING IN THE COMPUTER SERVICES INDUSTRY

Anacomp management believes that by the end of this decade, an effective competitor in the computer services industry must have at least \$50 million in sales annually.

The computer services industry is highly fragmented and currently supports in excess of 2,000 suppliers. Ten years ago there were nearly 4,000 companies competing in the industry. This 50% fatality rate is increasing as consolidations continue to more than offset the entries of new companies into the market place. The industry survivors have prospered and benefited from both their own experience and from the failures of their competitors. Certain parameters for building a sound computer service business have become axiomatic. They are: specialize by industry, remain technologically current, expand judiciously but expand, maintain a strong balance sheet, and most importantly, place profit as a primary and continuing objective. These axioms have formed the basis of Anacomp's business philosophy and were instrumental in achievement of Anacomp's 58% annual compound growth rate.

Specialization can either be by industry or by product category. A key element to success via specialization in the computer services market place is the careful targeting of a specific industry, and then strategic planning to acquire the expertise to provide improved services to that industry. Computer service suppliers must keep in mind that regardless of the service offered, it must solve a problem in a specific industry more economically than the industry is able to solve the problem itself. Survivors owe their existence in part to sophisticated sales and marketing efforts, and the ability to adapt their products to hundreds or thousands of customers.

Growth rate is an important factor to success in the market place. Traditionally, the computer services industry has achieved a compound growth rate of 20% per year, although during the recessionary period this slowed to a rate of 16%. Due to the consolidation in the industry, it is obvious that in order to be successful, a service company must achieve a growth rate equal to or greater than that of the industry as a whole. The industry growth rate of 20% positions it as one of the fastest growing sectors within the total data processing industry. Management of the leading companies within the industry have matured from venture risk takers to practical businessmen. This management has sustained a record of revenue and earnings growth over a period of years that is confirming the legitimacy of the industry. Anacomp's growth rate of 58% places it as one of the fastest growing companies in the industry.

The future of the computer services industry and the individual companies within the industry lies within the expectation that its companies will be more adaptable and responsive to the specific needs of target markets. The parameters of a growing corporation in the computer services industry to be considered successful in the year 1980 must appear as follows:

Sales	\$50,000,000
Pretax Income	\$5-6,000,000
Price/Earnings Ratio	Greater than 10
Dividend Yield	2-4%
Compound Growth Rate	
Sales	25%
Earnings	35%

-Ronald D. Palamara, Ph.D.
President and Chairman of the Board
Anacomp

KEYS FOR SUCCESS IN THE COMPUTER SERVICES INDUSTRY

Over the last decades, the services sector of the United States economy has grown at the rate of 9% compounded annually. During the same period, CSC's revenues have grown 18% annually, from \$53 million to \$235 million, while net income has increased 19% annually, to \$11.6 million. CSC's growth is indicative of the rapid expansion of the software and services sector of the computer industry. The services sector of our industry has also grown more rapidly than the hardware sector for a number of years, and industry analysts expect this trend to continue. This is not surprising in view of the corollary fact that the critical, limiting factor in the use of computers is software and its associated technology, and not in the hardware itself.

As hardware continues to decrease in cost and increase in capacity, the application of the intellectual process of problem-solving affords services companies virtually unlimited opportunities for growth. The changes occurring in hardware technology and those yet to come will have a major impact on the way we address problems and the way we apply our technology to their solution.

Rapid technological change has marked this industry from the outset. Continued change is the one thing we can predict with certainty. Consequently, a company's success in this evolving environment will depend to large degree on its ability to anticipate and respond to changes in the technology and in the marketplace. The major requirements for this success include:

- The technical resources to understand the changes taking place and the capability to apply the new technology in efficient solutions to the client's problems.
- A management staff that thoroughly understands its field, and is capable of both generating and capitalizing on market opportunities that arise. Part and parcel of this is a flexible organizational structure that allows the company to respond quickly and focus its resources on emerging opportunities.
- A wide breadth of services, enabling the company to offer the client a range of alternative solutions to his problem. We shall probably see a blurring of the distinctions between facilities management, network time-sharing, system development and other aspects of the services industry. A network service like INFONET, for example, can provide all of the services of a facilities management contractor; the only difference is the computer is off-site. Consequently, the scope of an organization's services will be a factor in the degree of its participation in tomorrow's market opportunities.
- An aggressive marketing philosophy. A company must continue looking for new opportunities and not expect to prosper on the strength of past successes.

The computer services industry has matured rapidly. As recently as 1967, not one independent company was listed on the Big Board. Today there are five. A decade ago there wasn't a single company in this industry doing \$100 million of revenue a year. Today there are a half a dozen, and a couple have joined CSC in the \$200 million ranks. That growth, and the favorable outlook projected for the future, make me confident of the prospects of both the industry and Computer Sciences.

Computer Sciences has shaped its growth toward the goal of becoming pre-eminent in the problem-solving business. Specifically, solving the problems associated with the application of computers and communications to client's needs for the collection, transmittal, processing and presentation of data.

Since its founding in 1959, CSC has evolved from a software house specializing in the development of systems software for computer manufacturers into a systems contractor undertaking some of the most complex computer-communications projects yet conceived. This evolution was systematically executed. Our objective was to establish a resource capable of solving the full range of problems to be faced in the use of the computer.

To accomplish this, we diversified our technical base. One of our first steps was to address the Federal Government market. The requirements of the Government's scientific, civilian and military agencies for computer and communications technology has been, and continues to be, the principal force advancing these technologies. Thus, through our activities in this market we were able to expand our technical resources to a breadth and depth that would not have been possible in the commercial marketplace at that time. These problem-solving activities are designated as "contract services" in our financial reports.

Another major step in CSC's evolution was our investment in INFONET, our network time-sharing service. We entered this field for several reasons: The market was projected to grow very rapidly. We saw an opportunity to augment our problem-solving capability with a network service on an international scale, utilizing strengths in communication engineering and system software. The validity of this decision is seen in INFONET's growth, which has been one of the fastest in the industry.

-William R. Hoover
Chairman and President
Computer Sciences Corporation

BENEFITS OF AN ACQUISITION STRATEGY

Surprisingly few firms in the computer services industry have adopted an acquisition strategy as a means to attain long-range corporate objectives. Those that have chosen this approach, however, are very actively acquiring other computer services firms, thereby contributing to the trend towards fewer, but larger, firms in the industry.

Acquisitions can be dangerously dilutive, both financially and from a management productivity standpoint. The direct costs of seeking acquisition candidates and completing a purchase are high and the time commitment required of top management is significant. Clearly, it is important to weigh from the outset whether the benefits to be received warrant the investment.

In order to see the role of acquisition in any company's plan, it is essential to understand the long-range objectives and strategies governing a company's actions. COMSHARE, for example, has chosen to pursue specialized markets with comprehensive, full-service product lines in order to achieve our profitability and growth goals.

At COMSHARE the benefits of acquisition are clear. Acquisitions are an important means by which we add competent staff and widen product breadth, both of which are critical to our long-range plan for industry and product-line specialization.

The key people that make up a successful computer services company are that firm's greatest single asset. But rarely are these people available on the open job market. **Staff additions, therefore, are the primary benefit of an acquisition strategy, particularly when the staff expertise is compatible with the long-term direction of the parent firm.**

The second most valuable asset of a computer service firm is its products. These are typically computer programs designed to solve some specific problem for a defined marketplace of existing and potential users. Because the risks of new product development are high, there is substantial value in a product which has a proven track record in the marketplace. **Therefore, the second most important benefit to be derived through acquisitions is in additions to product capability, particularly when such additions augment the pursuit of a full-service offering to some selected market.**

An acquisition strategy can also play an important role in enabling a computer services company to develop significant market shares in targeted markets. Market share is a meaningless concept in the overall \$5 billion computer services industry because no single firm is ever likely to be dominant when competing in such a large arena. But it is possible to achieve a dominant market share within specialty submarkets and to reap the classical benefits (brand name identification, leadership, reduced cost of sales) that such dominance affords. Market share is an achievable goal for computer services firms pursuing a specialization strategy. Acquisitions which contribute to growing a firm's market share position are highly desirable for that reason.

Other benefits may arise depending upon the specific company to be acquired, but the principle values are those that make major contributions to the pursuit of long-range goals.

-Richard L. Crandall
President
COMSHARE, Inc.

COMPUTER SERVICES AS A SPRINGBOARD INTO OTHER BUSINESSES

The topic is more appropriately put the other way around. The issue addressed by computer and information processing technology is that of productivity. And productivity improvement comes only when computers are actually supplied. Computer services offer a higher value-added product than any other segment of the data processing industry. Depending on the degree of vertical integration of the computer services supplier there are opportunities to supply separately the software, networking, computer service. Since the application of computers is still in its infancy, the computer services supplier is much more apt, however, to expand horizontally into new service markets and applications areas.

FINANCIAL EVALUATION FOR COMPUTER SERVICES COMPANIES

In our view at CDC one of the attributes of the data services business which is an indicator of promising financial performance is the modest requirement for assets. This means that our network for delivering services to our customers, once established, can be enlarged and improved, on a continuing basis with only moderate incremental investment. At the same time the network can be expected to handle substantial increases in load.

Computer services share one characteristic of service industries in general. A new service requires a long time to build up a critical number of users. Profitability in these early stages is less than that for product suppliers. Once critical mass is attained above average return on investment is achievable.

COMPETITION FROM MINICOMPUTER COMPETITORS

Minicomputers are another of many information processing delivery vehicles. Today they are used primarily as stand-alone systems. In the long run they offer a powerful adjunct to data service. We will blend them into our offering when it makes sense and offer the users choices spanning the data processing spectrum from large, centralized computer power to small remote minis.

POTENTIAL FOR INTERNATIONAL COMPUTER SERVICES

With the ever-lasting information explosion we view the international computer services market as an opportunity second to none.

Information is one of the few resources not in danger of exhaustion. We have not begun to exploit our technical capacity on a worldwide bases for dealing with it rapidly and effectively. Perhaps just as important is the phrase "International Presence". International businesses view our services as tools to aid them in selling their products or services. It is important they team up with a company that understands and offers worldwide accessibility and expertise.

The solutions to the problems of the so-called 3rd and 4th worlds will inevitably involve computer services, particularly for education.

BARRIERS TO GROWTH IN COMPUTER SERVICES

The barriers to growth are few. The world's need for productivity increases through better information availability and exchange - such as in technology for example - are enormous. Another example is computer aided education. Again effective application of computers is still in its infancy. It also requires great skill and patience. The services companies are in the best position to do this effectively because of skill scarcity and economics. Inappropriate legislative and regulatory approaches to the problem of information processing and communication are the single greatest barrier to having effective computer services in the world.

-Robert M. Price
President, Computer Groups
Control Data Corporation

HOW TO EVALUATE COMPUTER SERVICE COMPANIES

Computer services companies should be good cash generating companies because the capital startup costs compared to manufacturing are relatively low and the equipment can be leased to avoid a large front-end investment. Consequently, a computer services company should be able to generate the cash necessary to expand the company and still be in a comfortable position to pay a reasonable return to its stockholders in the form of dividends.

Important elements to look for when evaluating computer services companies are:

- 1) What kind of leverage can the company get on its people, software and hardware.
- 2) Is the company in a position to take advantage of future price performance and improvements in hardware.
- 3) Does the company have the kind of proprietary software which makes it difficult for its customers to switch suppliers.
- 4) Does the company have an aggressive, on-going proprietary software development program.
- 5) Is the company able to market its product to some extent on a value-added basis as opposed to a commodity type basis.
- 6) Does the company have a history of being able to hire and train good marketing, software development and operations people.

The parameters mentioned above are not necessarily financial. However, if the company has the characteristics mentioned above, it should enjoy an earnings per share growth long term between 10% and 20%; it should have a current ratio of between two and three to one; it should not have too much long term debt unless it has decided to buy most of its computers; and the company should build up its cash position and pay a dividend equivalent to between 20% to 50% of its profit.

-Thomas J. Marquez
Vice President and Director
Electronic Data Systems

MAJOR TRENDS IN SOFTWARE PRODUCTS

The future of the software product seems assured simply because it is based on a sound fundamental economic idea. The notion that software can be developed by a group of experts, "productized" in the sense of making it easily usable by many users, and then made available to a multiplicity of users makes economic sense because it provides economic leverage -- it raises the productivity level of those charged with producing processed information. That simple but powerful economic fact alone will provide impetus for continued development of software products as an enterprise. The economic fact is probably even more important today than it was 5 years ago because of the growing tendency to look at data processing in a hard-nosed way by continuing to challenge and test its cost effectiveness. But in so agreeing as to this economic fact, we have only scratched the surface of many interesting business and technical aspects of software products.

The canned soup market is mature since all sellers together probably supply over 95% of the available market while the usual case in software is that the aggregate penetration of the available market is closer to 10%. In other words, it is a rarity to see a type of product being used by more than 10% of the users who could conceivably cost effectively use the type of product.

Marketing costs for software products are high. In nearly all cases marketing costs account for 40%-70% of the total costs for selling the product. If the product is unusually profitable, marketing costs may be as low as 40%. If the product is less profitable, or has a narrow marketplace or is unduly complex, marketing costs may run as high as 70%. Marketing costs are high because software products are complex and require bright people to understand them and explain them to potential buyers.

The most significant new trend in software products is the rapid increase in application products. System or utility products were the first such products to be marketed. These are products which do not produce an end user result, but are only tools to allow the end result to be accomplished. Application product on the other hand is a software product used to produce an end user result. Application products are in the minority now -- the distinct minority. In the next ten years, however, it appears likely that application products will grow to become at least half the volume by dollar sale and will probably continue to grow faster than system product, becoming the preponderant type product in the latter part of the next decade.

The next major business step in the software products area will be that operating systems will become unbundled. IBM is apparently already taking the first step toward making operating system software separately purchasable. Theoretically, at least, this will aid those software companies whose primary business is the development and sale of operating system type software.

There is no question that eventually "firmware" will come into the picture. Future generations of computers will undoubtedly take advantage of the increasing cost efficiency and flexibility of semiconductor technology to develop plug-in modules which will accomplish much of what the software product is accomplishing today. Because this will require a totally new architecture for computers and because of the normal inertia of the marketplace, the industry is probably 10-15 years away from meaningful offering in "firmware". It would seem reasonable that the first such firmware to be offered would be operating system type software which is closest to the hardware. Next in likely order would be replacement of other system software such as utility software. Finally, applications become candidates for implementation in firmware.

What will be the role of software companies in this future regime of firmware? There is no reason why software companies cannot purchase the semiconductor hardware and offer it as a hardware/software add-on. In other words, the product would have to be hardware compatible as well as program compatible. With IBM the dominant figure in this industry, this could only happen, of course, if IBM either allowed it to happen or it were required by law to allow it to happen.

One thing seems certain: the number of computer program steps being executed today out of software products will greatly increase in the next ten years. If today 10%-15% of the executed instructions represent those from purchased software, in the next 10 years that figure will undoubtedly rise to 75%-80%. That revolution is providing challenges and opportunities for users and suppliers alike.

-Walter F. Bauer
President
Informatics

ACQUISITION STRATEGIES IN COMPUTER SERVICES

We in ITEL feel that an acquisition strategy is required in our particular business as our primary method of external growth. The reason we feel it is very important is that it is expedient and, if done well, avoids what otherwise would be a high failure rate for new entries in new industries. We use an acquisition strategy in four areas.

- 1) Expansion into new **geographic markets**—We have found that the optimum method of entering a new market is through acquisition. The main values in this type of acquisition are local management and people, local presence, and a client base from which to build by adding ITEL's product line and marketing approaches.
- 2) **New product** entries with special emphasis on on-line products—While we do develop many of our new products, we have found advantages to acquiring new product lines. After deciding on a new product entry there are advantages to acquiring companies who have the personnel, experience and clients in the new product areas. This approach saves time, ensures marketplace acceptance and enhances the chance of success.
- 3) When we enter **new industries** we like to acquire into those industries for the reasons given above.
- 4) We always look for **high growth** and profit opportunities through acquisitions.

The key financial factors are:

- 1) Sales productively expressed as new monthly revenue sold for each man-month in a territory.
- 2) Number of qualified salesmen.
- 3) Attrition rate of account leaving.

—William H. Bird
Intel Corporation

FINANCIAL EVALUATION PARAMETERS FOR COMPUTER SERVICES COMPANIES

The prudent investor in high-technology computer service corporations such as PRC seeks information other than annual report performance or typical D&B key ratio indicators. Factors other than discrete financial statistics should be considered. These include:

- Staff profile analysis, i.e., training, age level and industry experience of both management and staff.
- Mix of products and services, i.e., what new services are under development as dying fields diminish, including considerations such as operational product life.
- Analysis of the business backlog as well as the nature of current business and new-business development directions.
- Ranking among peer companies.
- Depth and breadth of current client base.

These parameters are obviously not all inclusive, but provide additional assistance to the investor who has already analyzed previous sales, profit, use of capital and conducted a thorough financial analysis for each specific company being considered.

PRC IN THE COMPUTER SERVICES MARKETPLACE

PRC has found that the keys to profitability are no different than they were ten years ago. What has changed is the marketplace and the new applications that technological evolution such as mini- and microcomputers have not only made feasible but economically justifiable. Systems engineering now assumes a "specialized" role in the mainstream of general data processing, and it is this specialized custom service and product area that PRC has gained dominance and recognition.

INFORMATION UTILITY

The need to share, have immediate access to, and update information, is paramount to many market segments having common characteristics. PRC has already responded to the needs of one such industry -- real estate. For this specific market segment, PRC has developed a sophisticated multiple listing computer complex with a telephone inquiry capability in which computer-generated voice responses are given to touch tone inquiries. In essence, a realtor from any phone booth can obtain basic real estate information on demand. Individual terminals located in the real estate offices supply comprehensive data on each property including complete financial alternatives.

PRC has similar information utility systems under development for other cohesive market sectors where updatable information is prerequisite to success. They include such diverse areas as education, library science, medical, agricultural and regulatory utilities.

FACILITIES MANAGEMENT

Facilities management has proven to be an appropriate way to handle relatively standardized types of work, i.e., insurance, banking and government accounting. PRC has been successful in the Federal Government sector and its marketing posture within this environment shows two faces: (1) in the operation and design of individual facilities management bases and cooperatives and (2) in the actual manning, applications, programming and maintenance of a total facility. Both sides of the facilities management spectrum have unique commonality to PRC. Since the initial underlying contracts were selected for maximum impact, PRC's "learning curve" has risen asymptotically. Government contracts now can be bid at relatively low labor rates while sustaining quality performance.

In summary, as the computer services industry observer has watched the evolution of computer technology, the investor has watched the reflex actions of computer service corporations catering to the same clientele. Unequivocally, the marketplace has changed for both. The technological metamorphosis has provided a fertile marketplace for software services organizations who have learned to customize services and slot their products to high demand areas.

-J. T. Sullivan
President
PRC Information Sciences Co.

ROLE OF SPIN-OFFS IN THE COMPUTER SERVICES INDUSTRY

Sun Information Services Company was created as part of the Sun Company strategy to expand into promising new business areas outside its traditional businesses. SIS' expansion will take place through internal growth and through acquisitions in selected markets.

Sun Information Services currently is a \$40 million network information services vendor that provides complete data processing services using its own systems and communications network and specialized telecommunications services.

Divisions and spin-offs play a major role in the computer services industry, e.g. CDC, McAuto, Boeing.

These companies bring financial strength and stability to an industry that is too new to have developed many solidly financed competitors, given the capital markets of the past ten years. They can provide a source of capital to enable owners of smaller companies to convert their success into cash, and to expand their operations with growing market opportunities.

SIS is a significant new entry. It brings:

- "Critical mass," the necessary ingredients required in order to not only be successful but develop a position of leadership in the industry.
- A base of large repeat customers.
- Significant profit potential and cash flow.
- Adequate financial resources and capital availability to develop and carry out its plans—staying power.
- The Sun Company reputation.
- Excellent technical resources in systems support, telecommunications and project planning.
- High quality management skills in key areas.

It must take the steps to attain the specialized knowledge and skills to enable it to successfully enter computer services markets outside the petroleum industry.

INDUSTRY/MARKET SEGMENTS

Our approach is to identify high growth target industry/market segments; find an entry niche where specialized knowledge or Sun Company strength can give us a competitive edge; acquire or develop that competitive position; enter the market segment, penetrate, expand and extend it into a major market position. Our selection of market segments is influenced by our strengths. We look for markets where our financial strength, professionalism, reliability, telecommunications, and nationwide scope can be important in securing customers and acquisitions. Services to banks and financial institutions is obviously one such market, in which we have made one small acquisition in 1977.

We will also continue to specialize in large systems management and processing including accounting systems and data bases for Sun and others. Currently we provide IBM data processing services and remote processing from our Dallas computer Center via our computer network operations, to over 400 terminals from San Francisco to Bermuda. We are also extending Cyber based processing capabilities.

FINANCIAL EVALUATION PARAMETERS FOR COMPUTER SERVICES COMPANIES

The industry offers little security for a company which develops a good idea and a market position. Evaluation of larger companies should look for growing resources and large market share in several important market segments; significant annual investment in market and products development; and growing cash flows available for development and building a financial base.

—J.M. Ryan
President
Sun Information Services

CRITERIA FOR EVALUATING COMPUTER SERVICES COMPANIES

The subject you are addressing in your report "Opportunities for Investment in the Computer Services Industry" is one that we feel our industry desperately needs to address. Many third parties (investment analysts, bankers, and accountants) use models or criteria developed by other industries in trying to evaluate our industry. We believe the two most commonly used evaluators, the balance sheet and profitability, are not the best indicators:

- 1) **Balance Sheet** -- Most of the companies within our industry carry a low book value. The primary assets of the computer service or software company are our products and people. Neither of these assets meets the accountant's definition of an asset and, therefore, they are not carried on our balance sheet. This forces our business to show a low net worth. An ideal company could have only cash and accounts receivable for assets, a small accounts payable balance and, consequently, a low net worth. That same company could have the best products in the industry.
- 2) **Profitability** -- Short-term profitability is also not a true indicator of a company's value. Most of the products developed by a software company and new ventures started by a service company in a development stage or expansion stage will usually be very low. These expanding companies are usually far better investments than a company that is letting its developed mature products bring a high margin without reinvestment.

Now that we have made the case for the two major indicators of the value of a company not applying to our industry, we should have an answer as to what are the best indicators. Unfortunately, we do not know of an easy answer. We at UCC try to evaluate computer service and software companies on several indicators:

- 1) **Products** -- What type of products and services does the company offer? What type of investment is the company making in enhancing existing products or developing new ones?
- 2) **Markets** -- What market is the company serving? Is the company in a growth market?
- 3) **People** -- Obviously, the most important asset, we feel, to any organization in our industry is our people. What type of people does the company employ and what is their longevity?
- 4) **Competition** -- Who is the competition and how strong are they?
- 5) **Growth Rate** -- What has the company done over the past 4-5 years in growth of revenue, products and services?

I am sure that this is not the type of criteria that most investment analysts would like to use. These indicators take a considerable amount of research and analysis in order to make an informed decision.

-F. L. Harvey
President, U.S. Group
University Computing Company



VII. INDUSTRY PARTICIPANTS

VII INDUSTRY PARTICIPANTS

- This section of the report contains twenty-eight reviews of leading industry participants. Although the securities analyst will be most interested in the independent companies, reviews of the computer services subsidiaries of large corporations are also provided for completeness.

- Each company review includes the following kinds of information:
 - Company Background and Description
 - Main Products and Services
 - Description of Facilities (computers, networks, etc.)
 - Industries Served
 - Geographic Coverage
 - Personnel Distribution
 - Major Applications
 - Name of CEO
 - Sales Data

- The market sectors of each company reviewed are summarized in Exhibits VII-1, 2 and 3.

- The companies reviewed are listed below. Reviews are arranged alphabetically by company within each group.

A. Independents

- . Anacomp
- . Applied Data Research
- . Automatic Data Processing
- . Bradford National
- . CompuServe
- . Computer Sciences
- . Comshare
- . Data Resources
- . Electronic Data Systems
- . IteI
- . Keydata
- . National CSS
- . National Data
- . On- Line Systems
- . Rapidata
- . Reynolds & Reynolds
- . Tymshare
- . University Computing (Wyly Corp.)

Exhibit VII-4 summarizes important securities market statistics for each independent company reviewed in this section.

B. Subsidiaries or Divisions of Large Companies

- . Control Data
- . General Electric Information Services
- . Informatics (Equitable Life)
- . INSCO Systems (Continental Insurance)
- . Martin-Marietta Data Systems
- . McDonnell Automation (McDonnell-Douglas)
- . Planning Research/Information Sciences Company
- . United Computing Systems (United Telecommunications)
- . Western Union Teleprocessing Services
- . Xerox Computer Services

EXHIBIT VII-I

COMPANY NAME \ TYPE OF SERVICE PROVIDED	BATCH PROCESSING	REMOTE COMPUTING	FACILITIES MANAGEMENT	SOFTWARE PRODUCTS	PROFESSIONAL SERVICES	OTHER
Anacomp		•	•	•	•	•
Applied Data Research				•	•	•
Automatic Data Processing	•	•				•
Bradford National	•	•	•	•	•	
Compu-Serv		•				
Computer Sciences		•	•		•	
Comshare		•				
Control Data	•	•		•	•	•
Data Resources		•			•	•
Electronic Data Systems			•			
General Electric	•	•	•		•	
Informatics		•		•	•	•
Insco Systems	•	•			•	
Itel	•	•				
Keydata		•				
Martin-Marietta Data Systems	•	•	•	•	•	
McDonnell Automation	•	•	•	•	•	•
National CSS		•	•		•	
National Data		•	•			
On-Line Systems		•	•		•	
PRC/Information Sciences	•	•	•	•	•	•
Rapidata		•				
Reynolds & Reynolds	•	•				•
Tymshare	•	•		•	•	•
United Computing Systems		•		•		
University Computing Company	•	•		•		
Western Union Teleprocessing	•	•	•			•
Xerox Computer Services		•				

EXHIBIT VII-2

<p>COMPANY NAME</p> <p>APPLICATIONS PROVIDED</p>	<p>GENERAL BUSINESS</p>	<p>SCIENTIFIC/ENGINEERING</p>	<p>SPECIALTY</p>	<p>UTILITY</p>
Anacomp			•	
Applied Data Research			•	•
Automatic Data Processing	•	•	•	•
Bradford National			•	
Compu-Serv	•	•	•	•
Computer Sciences	•	•	•	•
Comshare	•	•	•	•
Control Data	•	•	•	•
Data Resources			•	
Electronic Data Systems			•	
General Electric	•	•	•	•
Informatics	•	•	•	•
Insco Systems			•	•
Itel	•	•	•	•
Keydata	•			
Martin-Marietta Data Systems	•	•		
McDonnell Automation	•	•	•	•
National CSS	•	•	•	•
National Data	•		•	
On-Line Systems	•	•	•	•
PRC/Information Sciences	•		•	•
Rapidata	•		•	•
Reynolds & Reynolds	•		•	
Tymshare	•	•	•	•
United Computing Systems	•	•	•	•
University Computing Company	•	•	•	•
Western Union Teleprocessing	•		•	
Xerox Computer Services	•	•	•	

EXHIBIT VII-3

COMPANY NAME	INDUSTRY MARKETS SERVED									
	MANUFACTURING	TRANSPORTATION	UTILITIES	DISTRIBUTION	BANKING & FINANCE	INSURANCE	MEDICAL	EDUCATION	GOVERNMENT	OTHER
Anacomp	•		•	•	•	•	•	•	•	
Applied Data Research	•	•	•	•	•	•	•	•	•	•
Automatic Data Processing	•		•	•	•		•		•	•
Bradford National	•		•		•				•	•
Compu-Serv	•				•	•				
Computer Sciences	•	•	•		•	•			•	•
Comshare	•		•		•					•
Control Data	•			•	•	•	•	•	•	•
Data Resources	•				•	•		•	•	
Electronic Data Systems				•	•	•	•			
General Electric	•		•	•	•		•		•	•
Informatics	•					•	•		•	•
Insko Systems	•					•				
Itel	•			•	•					•
Keydata	•			•						
Martin-Marietta Data Systems	•			•	•				•	•
McDonnell Automation	•		•	•		•	•		•	•
National CSS	•	•	•	•	•	•				•
National Data	•	•		•	•		•			•
On-Line Systems	•	•	•	•	•	•			•	
PRC/Information Sciences					•				•	•
Rapidata	•		•		•				•	
Reynolds & Reynolds				•						
Tymshare	•		•	•	•	•	•		•	•
United Computing Systems	•	•	•	•	•			•	•	•
University Computing Company	•				•					•
Western Union Teleprocessing	•		•	•	•			•		•
Xerox Computer Services	•		•	•					•	

EXHIBIT VII-4

SUMMARY OF SECURITIES MARKET DATA* FOR SELECTED
INDEPENDENT COMPUTER SERVICES COMPANIES AS OF SEPTEMBER 30, 1977

COMPANY (MARKET SYMBOL)	SHARES TRADED	1977 PRICE RANGE		CURRENT PRICE (\$)	NO. OF SHARES OUTSTANDING	TOTAL MARKET VALUATION (\$000)	EARNINGS PER SHARE (LAST 12 MOS.) (\$)	CASH DIVIDENDS IND. RATE (\$)	P-E RATIO
		HIGH	LOW						
ANACOMP (ANCM)	OTC	9-5/8	7	8-1/4	990,319	8,167	1.14	.20	7
APPLIED DATA RESEARCH (ADR)	ASE	9-5/8	5-1/8	7-3/8	1,234,400	9,104	1.05	NIL	7
AUTOMATIC DATA PROCESSING (AUD)	NYSE	30-1/2	21-1/2	26	15,133,000	393,458	1.58	.40	16
BRADFORD NATIONAL (BDR)	ASE	10-5/8	7-1/2	9-3/8	4,044,000	37,913	0.68	.20	14
COMPU-SERV (CMPU)	OTC	14-3/4	9-3/4	11-1/2	1,107,256	12,731	1.23	NIL	9
COMSHARE (CSRE)	OTC	7	4-3/4	7	1,377,000	9,639	0.82	NIL	9
COMPUTER SCIENCES (CSC)	NYSE	9-7/8	6-3/4	8-3/8	14,342,917	120,123	0.85	NIL	9
DATA RESOURCES (DRIS)	OTC	21-1/2	14-1/8	21-1/2	1,246,483	26,789	1.52	.12	14
ELECTRONIC DATA SYSTEMS (EDS)	NYSE	20-1/4	15-1/8	15-3/8	12,930,585	198,814	1.31	.72	12
ITEL (I)	NYSE	21-7/8	12-1/2	20-3/4	8,300,000	172,225	2.54	.30	8
KEYDATA (KEYD)	OTC	3	1-3/4	1-3/4	2,716,217	4,753	0.13	NIL	13
NATIONAL CSS (NCS)	ASE	26	18-7/8	25-1/2	1,117,867	28,509	2.92	.40	8
NATIONAL DATA (NDTA)	OTC	7	4-3/8	7	4,377,000	30,639	0.52	.12	13
ON-LINE SYSTEMS (ONL)	ASE	22-3/4	15-5/8	16-1/2	860,220	14,190	1.62	.20	10
RAPIDATA (RAPD)	OTC	2-3/4	1-5/8	2-1/4	1,822,921	4,102	0.28	NIL	8
REYNOLDS & REYNOLDS (REYNA)	OTC	20	16-1/2	18-3/4	4,686,540	87,881	2.04	.60	9
TYMSHARE (TYM)	NYSE	23-1/8	18	18-5/8	4,337,189	80,776	1.72	NIL	11
WYLY (UNIVERSITY COMPUTING) (WLY)	NYSE	2-3/8	3/4	7/8	8,327,472	7,286	0.60	NIL	1

*SOURCES: ANNUAL REPORTS, STANDARD & POORS, QUOTRON

A. INDEPENDENTS

COMPANY HIGHLIGHT

ANACOMP INC.
6161 Hillside Avenue
Indianapolis, IN 46220
(317) 257-6555

Ronald D. Palamara, President
and Chairman of the Board
Public corporation, OTC (ANCM)
Total employees: 400
Total sales, fiscal year end
6/30/77: \$16,183,279

THE COMPANY

- Anacomp is a computer services company specializing in software development, online services, facilities management, and micro-graphics services to approximately 600 clients. Between 1975 and 1976 it grew 44%, from \$8.9 million to \$12.8 million. It grew to \$16.1 million in 1977, a 26% increase.
- Net earnings during the same two-year period doubled from \$516,000 to 1,192,238. Earnings per share in fiscal year 1977 were \$1.09 with 1,091,000 share outstanding.
- It was organized in Indiana in 1968 by a group of professors and consultants from Purdue University. Through March of 1970 revenues were derived from internal development and the creation of new services. Its major business was creating and selling programmed instruction tapes and cassettes. Online data processing services were also offered. From 1970 to 1975, growth came from acquisition.
- Anacomp's aggressive acquisition policy has been an asset during the recent period of computer services industry consolidation.
 - It recently announced an agreement in principle to acquire all outstanding stock of Computer Management, Inc. (CMI), Cleveland, Ohio. CMI provides software development for IBM mainframes as well as computer output microfilm services.
 - The 1975 acquisition of Electronic Data Preparation Corporation in Florida, a software company specializing in development and implementation of banking and thrift institution software (CI/RF and IRFS) has provided Anacomp with the expertise to make a further penetration into banking and finance markets. Thus, Anacomp is well positioned to take advantage of the advent of electronic funds transfer systems for banks, savings and loans, and credit unions, using advance work done on distributed data processing systems and point of sale processing.

COMPANY HIGHLIGHT/ANACOMP INC.

- Acquisition discussions with both Midwest Advanced Computer Services in 1976 and Computer Usage Corporation in 1975 have been discontinued.

KEY PRODUCTS AND SERVICES

- Anacomp has four divisions which provide services and some products to principally banking and government clients located throughout the U.S. and in Europe and the Philippines. The Divisions are: Software Services, Facilities Management, Data Services, and Micrographics.
- The Software Services Division, generated 26% of company revenues in fiscal year 1977. It has developed large-scale proprietary applications software and for 12 banks and savings and loan clients with NCR equipment. In addition, it offers consulting services to government clients. The two principal software packages are CI/RF (Customer Integrated/Reference File) and IRFS (Integrated Real-Time Financial Systems) for savings and loans.
- The Facilities Management Division generated 25% of total revenues in fiscal year 1977. It provides on-site facilities management (FM) services to 13 states and local government agencies and financial institutions. Several of the FM contracts utilize the software developed by the Software Services Division.
- The Data Services Division generated approximately 17% of revenues in 1977. It provides online, interactive processing services to 152 users, primarily banks, savings and loans, and credit unions. City and county municipalities are also clients. All services are offered through Anacomp-run Data Centers, or shared data processing facilities. They are essentially cooperatives for data processing.
- The Micrographics Division, formerly the COM division, generated 32% of total revenues in 1977 and has 425 clients. It provides computer output microfilm services to clients with in-house data processing facilities and personnel. Micrographics also offers business graphics, micropublishing and republishing, and markets micrographics film and COM duplicating equipment.

APPLICATIONS Much of the software developed by Anacomp is for industry-specialized application.

COMPANY HIGHLIGHT/ANACOMP INC.

INDUSTRY MARKETS The financial industry and government generated over 70% of Anacomp revenues in 1976:

Banking and Finance	36%
Government	35
Manufacturing	11
Utilities	5
Distribution	4
Medical/Hospital	4
Insurance	3
Education	2
	<hr/>
	100%

GEOGRAPHIC MARKETS

- Anacomp has offices in Indianapolis, IN; Cleveland, Cincinnati, Columbus, and Dayton, OH; Sarasota, Fort Pierce, and Bradenton, Florida; South San Francisco and Stockton, CA; Rizal, Phillippines; London, England; and Brussels, Belgium.
- Its clients are principally located in the North Central U.S., as shown below:

New England	0 %
Northeast	9
Southeast	27.5
North Central	49.6
Midwest	1
Mountain	0
Pacific Coast	6.3
International	6.6%

COMPUTER SOFTWARE AND HARDWARE

- Anacomp utilizes a variety of computer equipment in providing its services. NCR mainframes are used for software design and implementation and facilities management. On-line processing is principally on Burroughs equipment. Various minicomputers are currently being evaluated for use as part of Anacomp services.
- Anacomp uses the following equipment to provide its services:

NCR Century 201	2	IBM 548	1	Betacom 700L	5
NCR Century 200	2	Burroughs B27711	1	Pertec 3700	5
NCR Century 300	1	Datagraphix 4440	1	Entrex 480	5
IBM 360/30	1	Datagraphix 4360	1		

COMPANY HIGHLIGHT

APPLIED DATA RESEARCH
Route 206 Center, CN-8
Princeton, NJ 08540
(609) 921-8550

John R. Bennett, President
Public corporation, AMEX
Total employees: 270
Operating revenues, fiscal year
end 12/31/76: \$15,762,484.

THE COMPANY

- Applied Data Research (ADR) is a profitable and rapidly growing software, contract programming, and communications hardware company. In 1976, revenues increased to \$15.8 million; up 24%, from 1975 revenues of \$12,738,765. Net earnings grew 233% in the same period, from \$431,736 to \$1,440,164. Fully diluted net earnings per share of common stock grew from \$.36 to \$1.11 with 1.2 million shares outstanding.
- ADR management is concentrating on internal growth (primarily IBM-compatible software packages); there is not a strong emphasis on acquisitions. The company's growth is limited by a relatively small sales force which cannot cover IBM sites in the U.S.
- ADR is well positioned to take advantage of the growth opportunities in the software and communications tester market with products which are both unique and well received.

KEY PRODUCTS AND SERVICES

- Software products which generated 66% of ADR revenues in 1976, are expected to have the fastest growth of any ADR product, as shown below:

<u>PRODUCT</u>	<u>1976 Revenues</u>	<u>% of Total</u>	<u>Projected Growth Annual</u>
Software Products	\$ 10.4	66.2%	25%
Communication Hardware	2.8	17.8	8
Contract Programming	2.5	16.0	6%
<u>TOTAL</u>	<u>\$ 15.7</u>	<u>100.0%</u>	

COMPANY HIGHLIGHT/APPLIED DATA RESEARCH

- The software packages are all utility products designed to assist IBM 360/370 users to design, implement, test, maintain, and control their data processing requirements as well as reduce the cost of operations.
 - ADR derives 50% of its software revenues from overseas.
 - "Librarian," ADR's most successful product, accounted for one-third of total company sales in 1976.
 - Other products include MetaCOBOL, ROSCOE, LOOK, Extended Text Compositor, and Automated System Charter.
 - The following chart depicts ADR software packages.

UTILITY PACKAGES SOLD BY ADR

Name of Product	Applications	Average Price	# of Users	1976 Revs.	Competitors
Autoflow	Systems design tool	\$10K	2000	\$.7M	Unique (No Comp)
Roscoe	Interactive prog. development tool	40K	300	3.2M	IBM TSO
Librarian	Data Storage & manipulation	7K	3500	4.8M	Pansophic Systems
Meta COBOL	COBOL optimization prog.	12K	300	.8M	Unique DBMS
Look	Performance Measure. tool	\$ 6K	250	.7M	Boole & Babbage; Hardware
Miscellaneous	Misc.			\$.2	
Total number of products sold: 6,350 Total number of communications customers: 150			TOTAL \$10.4M		

COMPANY HIGHLIGHT/APPLIED DATA RESEARCH

- In addition, ADR manufactures telephone control and monitoring products including the Star Telephone Center Management System, the Automatic Call Analyzer, and the Telephone Control and Accounting System. Over 150 STAR systems are installed in the U.S. and Canada.
- ADR provides professional services and contract programming through two research subsidiaries: ADR Services, Inc. (ADRSI) Washington, D.C.; and Massachusetts Computer Associates, Inc. (COMPASS) Boston, Massachusetts.
 - ADRSI performs requirements analysis, planning, design, development, and systems management services for government and industrial mainframe and minicomputer users.
 - COMPASS performs systems engineering, software development and research, and specialized language development for government and industrial users.
- ADR employees have grown from 200 in 1976 to 270 in 1977. They are distributed through the following functions:

Total Marketing	60
- Software Sales	20
- Hardware Sales	7
- Marketing Support & Administration	33
R & D	20
Operations (includes 45 in Contract Programming)	150
Administration	<u>40</u>
TOTAL	270

COMPANY HIGHLIGHT

AUTOMATIC DATA PROCESSING INC.
405 Route 3
Clifton, NJ 07015
(201) 472-1000

Frank A. Lautenberg, Chairman & CEO
Public corporation, NYSE
Total employees: 7,500
Total revenues, fiscal year end
6/30/77: \$245,487,000

THE COMPANY

- Automatic Data Processing, Inc. (ADP) principally provides packaged general business data processing services. In the last year it has increased its industry-specialized services and is now offering turnkey small business computer systems as part of some services.
- Three acquisitions in FY 1977 led to restated revenues and earnings for 1976:
 - The CPI Group Incorporated, Newport Beach, CA, with 6/30/76 revenues of approximately \$3.3 million and net earnings of approximately \$450,000. It provides computerized administrative, trustee and custodial services for individuals, proprietorships and partnerships, and small corporations.
 - First Data Corporation, Waltham, MA with 3/31/76 revenues of \$5.8 million and net earnings of \$700,000. FDC provides DEC 10-based interactive, remote batch and local batch processing services to primarily government, manufacturing, and distribution clients.
 - Financial Computer Corporation, Clifton, NJ, with FY 1977 revenues of \$2 million. FCC provides 78 savings and loan associations and 11 mortgage bankers in New York and New Jersey with on-line financial industry accounting services. It was acquired by ADP in March 1977.
- One of the largest computer services companies in the world, ADP grew from \$163.2 million in 1975 to \$199.2 million in 1976 (restated) a growth of 22%. ADP's 1977 revenues reached \$245.5 million, a 23% increase over 1976 revenues. The company earned \$23.3 million in 1977, a growth of 25% over restated 1976 net earnings of \$18.7 million. Restated net earnings per share during the same period increased 22% from \$1.28 to 1.58 with 14,786,000 shares outstanding.
- The major management challenges are:
 - To harmoniously integrate new acquisitions into the company.
 - To further integrate the network and commercial services into a

COMPANY HIGHLIGHT/AUTOMATIC DATA PROCESSING INC.

total package competing effectively against the in-house small business computer systems.

- Integrate mini/microcomputer products into the total service package offered by ADP.
 - Maintain the growth & profitability momentum to enable the company to maintain its acquisition momentum.
- There are over 7,500 employees working at ADP. They are segmented as follows:

Marketing	15%
Administration	12
R&D	5
Operations	<u>68</u>
	100%

KEY PRODUCTS AND SERVICES

- ADP revenues are generated by the following groups:

Commercial Services	50%
Network Services	15
Special Industry Services	<u>35</u>
	100%

- Despite an acceleration of emphasis from batch processing to remote computing, the latter still constitutes 20% of revenues with batch services accounting for the balance.
- The Commercial Services group provides payroll processing, accounts payable, accounts receivable, general ledger and financial reporting services to over 40,000 accounts.
- Cyphernetics forms the core of the Network Services Division. Delos and First Data will round out the on-line processing services provided by ADP. All three of these on-line processing groups use the DEC System 10 as their mainframe processor.
- Special industry services include:
 - ADP Autonet-management information systems for over 200 liquor wholesalers
 - ADP Dealer Services-accounting and inventory services to approximately 6,000 auto, farm, and industrial dealers in 50 states.

COMPANY HIGHLIGHT/AUTOMATIC DATA PROCESSING INC.

- Banking and Thrift Services-batch and on-line accounting services to commercial banks and thrift institutions.
- Financial Data Services-computerized recordkeeping and securities management services for the investment community. ADP recently announced an agreement with the Midwest Stock Exchange Service Corporation (MSESC) whereby MSESC's approximately 50 customers will have the opportunity to convert to ADP's brokerage data processing services.
- Real Estate Management Services-full service ADP FASTRENTS, used by builders, developers, banks, and property owners and managers of more than 600,000 rental units.
- Health Information Services-on-line, batch, and remote batch processing services to more than 190 nursing homes and medical centers.

- ADP also offers retirement plan accounting and administration services for individuals and small corporations.

APPLICATIONS ADP application revenues are derived as follows:

	<u>Batch</u>	<u>On-Line</u>	<u>Total</u>
General Business	44%	4%	48%
Scientific & Engineering		1	1
Specialty Applications	35	5	40
Utility		10	10
Other	<u>1</u>		<u>1</u>
TOTAL	80%	<u>20%</u>	<u>100%</u>

INDUSTRY MARKETS

- ADP provides services to more than 45,000 firms from a variety of industries, primarily manufacturing, distribution, and banking, as shown below:

- Manufacturing: discrete and process	34%
- Banking and finance	30
- Distribution - wholesale and retail	28
- Utilities	3
- Medical/Hospital	3
- Government	<u>2</u>
	100%

- Occasionally ADP also serves the services industry: accountants, construction companies, hotels, theaters, architects, engineers, and research firms.

COMPANY HIGHLIGHT/AUTOMATIC DATA PROCESSING INC.

GEOGRAPHIC MARKETS

- ADP branch and sales offices are distributed throughout the U.S. and Europe. Recently the firm has also opened offices in Brazil. ADP's estimate of its 1977 revenue distribution by geographic region is as follows:

New England	10%
Northeast	30
North Central	20
Southeast	10
Midwest	10
Pacific States	9
South Central	5
West	2
International	4
Total	<u>100%</u>

- ADP U.S. facilities and locations are as follows:

Akron, OH	East Hanover, NJ	Morriston, NJ
Albany, NY	Florence, KY	Mountain View, CA
Ann Arbor, MI	Fremont, OH	Nashville, TN
Ashland, KY	Fort Worth, TX	Newport News, VA
Atlanta, GA	Grand Rapids, MI	New York, NY
Auburn, MA	Hartford, CN	Norfolk, VA
Baltimore, MD	Holland, MI	Orlando, FL
Bath, ME	Honolulu, HI	Philadelphia, PA
Binghamton, NY	Houston, TX	Phoenix, AZ
Birmingham, AL	Indianapolis, IN	Pittsburgh, PA
Boston, MA	Kalamazoo, MI	Portland, OR
Buffalo, NY	Kansas City, KS	Princeton, NJ
Centralia, IL	Kansas City, MO	Providence, RI
Chicago, IL	Kensington, MD	Richmond, VA
Cincinnati, OH	Lansing, MI	Rochester, NY
Cleveland, OH	Long Beach, CA	San Diego, CA
Clifton, NJ	Long Island, NY	San Francisco, CA
Coldwater, MI	Los Altos, CA	Seattle, WA
Columbus, OH	Los Angeles, CA	Stamford, CT
Dallas, TX	Louisville, KY	St. Louis, MO
Dayton, OH	Lutherville, MD	St. Paul, MN
Denver, CO	Mason, MI	Syracuse, NY
Detroit, MI	Miami, FL	Tampa, FL
District of Columbia	Milwaukee, WI	Toledo, OH
East Brunswick, NJ	Minneapolis, MN	Troy, OH

COMPANY HIGHLIGHT/AUTOMATIC DATA PROCESSING INC.

- International locations are in Sao Paulo, Brazil; Calgary, Toronto, and Vancouver, Canada; Antwerp and Brussels, Belgium; Dublin, Ireland; Milan, Italy; Amesterdam, Rotterdam, and The Hague, Netherlands; Zurich, Switzerland; Birmingham, London, and Manchester, United Kingdom; and Cologne, Dusseldorf, and Frankfurt, West Germany.

COMPUTER HARDWARE AND SOFTWARE: ADP uses a variety of computer equipment, as shown below:

55	IBM	360 and 370, approximately 15 of these are 370 series
25	DEC	PDP-10
125	DEC	PDP-8 & PDP-11
2	Burroughs	4700
3	Honeywell	2200
3	Sperry Univac	418

COMPANY HIGHLIGHT

BRADFORD NATIONAL CORPORATION
2 Broadway
New York, NY 10004
(212) 480-1600

Peter Del Col, President
Public Corporation, AMEX
Total employees: 2400*
Total revenues, fiscal year
end 12/31/76: \$65,804,000

THE COMPANY

- Bradford was founded in February 1968 by Donald K. Lourie (retired), Peter Del Col (Chairman of the Board, President, and Chief Executive Officer), Howard Waltman (Executive Vice President), and Sol Seltzer (Executive Vice President). The company initially provided software and systems development services to a few customers, principally the U.S. Government.
- The company determined early to diversify into paper and clerical-intensive services connected to financially-related record keeping. In June 1969, Bradford began the first of such services, its mutual fund services operation.
- Bradford's revenues grew from \$57.3 million in 1975 to \$65.8 million in 1976, a growth of 14.8%. Net income declined 25% during the same period from \$4.0 million to \$3.2 million.
- Net income per share declined from \$1.02 in 1975 to \$.79 in 1976 although dividends per share rose from \$.15 in 1975 to \$.20 in 1976. Outstanding shares numbered 4.0 million. The company claimed reduced earnings resulted from costs associated with both expansion of facilities and start-up and conversion for newly acquired national accounts.
- Bradford has grown through internal effort as well as external acquisitions and joint ventures.
 - By strategically-placed acquisitions and by successful joint ventures with major banks such as Bankers Trust, Mellon National Bank, and Crocker National Bank, Bradford has become the dominant computer services company in the securities-related record-keeping business.
 - It has developed methods that enable it to efficiently perform many of the banking functions without being a commercial bank and therefore subject to the Bank Company Holding Act of 1956.

* Estimate by Bradford

COMPANY HIGHLIGHT/BRADFORD NATIONAL CORPORATION

- Bradford has a base of technical expertise and experience in electronic transaction processing. As the financial industry moves away from paper-based and toward electronic transactions and record keeping, this expertise will place Bradford in a strong position to move into new business areas aligned with this migration.
- Potential problem areas are loss of large management contracts and discontinuance after 1977 of the contract with National Clearing Corporation.
- On the other hand, Bradford was successful in signing a contract with Chase Manhattan Bank in 1976. This contract was fully operational in January 1977 and should provide for annual revenues in excess of \$10 million for Bradford. In addition, Bradford has signed up other business which is expected to provide for at least a \$5 million growth in 1977. With additional business yet to be sold and the Chase contract, Bradford should have a healthy growth this year.

KEY PRODUCTS AND SERVICES

- Bradford is one of the leading financial services organizations in the U.S. specializing in providing integrated services involving computer operations and machine-based clerical systems.
- Corporate shareholder services are provided to banks and corporations. They include transfer agent and registrar services, including record keeping for securities transactions, a clearing corporation (TAD) for certificateless transfers, proxy material mailings, and correspondence. Labor intensive services, they have been declining as a proportion of Bradford's total business.
- Mutual fund services are similar in nature to corporate shareholder services but include total funds custody services, subscription processing, dealer orders, confirmation, redemptions and dividends.

COMPANY HIGHLIGHT/BRADFORD NATIONAL CORPORATION

- Trust Services have a custodial function for Bradford Customers total portfolio. Employee benefit services include accounting and record-keeping for pensions, profit-sharing funds, securities safekeeping, delivery, receipt and clearing of securities, and collection and disbursement of all income. Bradford also provides loans to brokers and dealers to facilitate securities clearance activities. Bradford provides banks with a system for calculating principal and income transactions as well as many other options. This profitable segment has been increasing at a considerably faster rate than the rest of the company's business.
- Securities clearance and draft collection services are accomplished by Bradford Securities Processing Services, Inc. (BSPS) through a network of facilities for commercial banks, municipal bond dealers, and brokers. BSPS advances or arranges bank advances of draft collection funds to customers. Interest is charged on the daily balance of such receivables. Other services include receipt and payment for securities, nationwide movement and delivery of securities, and the collection of funds.

This group includes BSPS, SPS Options Services, Inc., a registered broker dealer, and TAD Depository Corporation, a "clearing corporation" which makes "certificateless transfers" of securities (Bradford has a 20% interest). Bradford also has a facilities management contract with the National Clearing Corporation.

- Systems and Facilities Services are generating a declining proportion of corporate revenues. These Services include: consulting, system design, and training to help government and commercial clients perform more efficiently. Government agencies are the principal clients for this service.
- Banking Services are correspondent banking, personal trust systems, and standard banking packages for commercial banks as well as systems consulting and facilities management services to banks and trust companies.

APPLICATIONS MARKETS Bradford applications are as follows:

Specialty Applications & Services	76%
Facilities Management	5
Professional Services	<u>19</u>
	100%

COMPANY HIGHLIGHT/BRADFORD NATIONAL CORPORATION

INDUSTRY MARKETS At year end 1976, Bradford was serving more than 2,000 corporations and 6,000,000 shareholders with its shareholder services. Through its other services, its customers include 50 mutual funds, 250 corporations and financial institutions, and the Federal Government.

GEOGRAPHIC MARKETS

- Bradford is concentrated heavily in the New York/Boston/Washington corridor which provides well over half of its revenues. The other area of significant market penetration is Los Angeles/San Francisco where Bradford has significant operations with Crocker National Bank among others.
- Bradford has not penetrated the Midwest or South of the U.S. to any extent and does not have significant revenues from any activities outside the U.S.
- The corporation has offices in: New York, Boston, Chicago, Cleveland, Kansas City (MO), Miami, Sarasota (FLA), Dallas, Los Angeles, Minneapolis, Teaneck (NJ), Pittsburgh, San Diego, San Francisco, and Rockville (MD).

COMPUTER HARDWARE AND SOFTWARE

- Bradford operates some 25 processing facilities throughout the U.S. However, many of these are simply remote processing locations connected to one of Bradford's major centers.
- Bradford has major operating centers in Boston, New York, Teaneck, San Francisco, and Los Angeles. In the last several years, Bradford has made a major effort to coordinate its centers on a network. This development is not completed.
- The equipment operated by Bradford is primarily IBM System 360/370s. It still has many DOS systems but is operating in VS1 and VS2 in the major centers.

COMPANY HIGHLIGHT

COMPUSERVE INCORPORATED
5000 Arlington Center Blvd.
Columbus, OH 43200
(614) 457-8600

Jeffrey M. Wilkins, President
Public corporation, OTC
Total employees: 247
Total revenues, fiscal year end
12/31/77: \$11,397,000

THE COMPANY

- CompuServe Incorporated was incorporated as Compu-Serv Network, Inc., a wholly owned subsidiary of Ilex Corp., in Ohio in June 1969. It provided contract programming and interactive data processing services through its computer facility in Columbus, Ohio. In 1975, Compu-Serv Network, Inc. went public and stock was issued to Ilex shareholders. In May 1977, the name was changed to CompuServe Incorporated.
- The company currently provides remote batch and interactive processing to more than 750 customers in 25 states. Revenues grew from \$8.5 million in 1975 to \$11.4 million in 1976, a 34% growth. New earnings during the same period, grew from \$355,000 to \$1.2 million, an increase of 240%.
- With a very active and aggressive marketing program, CompuServe has sales offices serving 35 U.S. cities.
- More than 50% of the company's employees concentrate on marketing, 30% on operations, 12% on administration, and 3% on research and development.

KEY PRODUCTS AND SERVICES

- Fifty percent of CompuServe revenues are derived from utility processing; the rest are product related. The company's software library has more than 75 software programs.
- Successful products include:
 - Rapid Response data base system. The most successful Compu-Serve product, Rapid Response incorporates message switching functions.
 - RSM-3 (Response Surface Methodology), an R&D tool to help companies expedite the experimental design, data analysis, and optimization of product characteristics.

COMPANY HIGHLIGHT/COMPUSERVE INCORPORATED

- BPMS (Bond Portfolio Management System). This is designed to perform financial analysis to aid banks in increasing their yields on municipal, government, and agency bonds.
- CUFFS and FACTS These are cross-industry financial display and analysis programs.
- LIDIS This is a life insurance data information system.
- Other CompuServe programs include: System 1022, a data base manager; STATS, statistical subroutines; FILAGE, file generator and text editor; IRS, an information retrieval system; ICS, an integrated editor and system command language.
- CompuServe concentrates on selling its data base, financial and utility services to large corporations with over \$100 million in annual revenues.

APPLICATIONS CompuServe's product-related revenues are derived from the following applications:

- 80% business-related processing (e.g., data base and financial forecasting)
- 15% speciality applications (e.g., bond portfolio analysis)
- 5% engineering and scientific applications.

INDUSTRY MARKETS Although CompuServe currently serves 20 industries, nearly 50% of its annual revenues are derived from five industries, as shown below:

<u>Industry Served</u>	<u>Percentage of Total Revenue</u>
Services	11.4%
Government	10.6
Insurance	8.4
Chemical	7.9
Mining	7.5
Other 20 industries	<u>54.2%</u>
	100.0%

GEOGRAPHIC MARKETS

- CompuServe currently has 24 sales offices serving 35 metropolitan areas in the U.S. The offices are located in: Akron, Atlanta, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Detroit,

COMPANY HIGHLIGHT/COMPUSERVE INCORPORATED

Houston, Indianapolis, Los Angeles, Louisville, Memphis, New Jersey, New York City, Palo Alto, Philadelphia, Pittsburgh, San Francisco, Stamford, St. Louis, Tucson, and Washington D.C.

- The CompuServe client base is nationwide with concentrations in the North Central and North Eastern regions.

COMPUTER HARDWARE AND SOFTWARE The company operates 11 DEC PDP/10s in Columbus, Ohio.

COMPANY HIGHLIGHT

COMPUTER SCIENCES CORPORATION
650 North Sepulveda Blvd.
El Segundo, CA 90245
(213) 678-0311

William R. Hoover, President
Public corporation, NYSE
Total employees: 7,800 worldwide
Total revenues, fiscal year end
4/1/77: \$234,745,000

THE COMPANY

- Computer Sciences Corporation (CSC), founded in 1959 in Nevada, was one of the first companies to provide systems software and consulting. It has since expanded its professional (contract) services to include systems engineering and development, communications engineering, and facilities management, and offers remote data processing services through its INFONET network.
- The company's revenues increased from \$177.3 million in fiscal 1975 to \$219.9 million in 1976, a 24% growth while net earnings grew from \$3.6 million to \$7.2 million, a leap of 98%.
- Fiscal 1977 revenue growth was not as dramatic: revenues increased \$15 million to \$235 million, a 7% growth. However, net income continued to improve as the positive impact of Infonet's operations and improved margins in the contract service business became amplified. Earnings from operations grew from \$7.2 million in 1976 to \$11.6 million in 1977, a 61% increase. In addition, \$3 million was added as an extraordinary item, increasing 1977 net profit to \$14.6 million.
- A financially leveraged company, CSC has a debt to equity ratio of 1.4:1. As the company improves this ratio and strengthens its financial posture, management can start a meaningful acquisition program. This will accelerate the company's diversification efforts and reduce the proportion of revenues derived from the government market.
- CSC's INFONET is among the leading companies in the remote computing industry, based on revenues and profitability. This is a reflection both of the competitiveness of the product and the productivity of the INFONET organization.
- CSC's greatest strengths are the technical system design and programming skill of its professional staff and the experience of its management personnel.

KEY PRODUCTS AND SERVICES

- CSC's business can be segmented into two broad groups: INFONET (the international remote computing service) and Contract Services.

- CONTRACT SERVICES

- Contract Services represented 75% of CSC's business in fiscal 1977. Of this, systems development generated more than half as shown below:

	<u>Contract Services</u>	<u>Total Corporate</u>
Systems Development	67%	50%
Network	--	25
FM	25	19
Comm. Engr.	<u>8</u>	<u>6</u>
	100%	100%

- During 1977, Contract Services operating income (before taxes and corporate charges) grew 34% while revenues grew only 3%. This 3% revenue growth is 11% below Contract Services' 10-year average rate. According to management, most of this decline resulted from a slower growth rate of revenues from the Federal Government, a leveling off of European and Mideast revenues, and the completion of a Canadian contract. New orders in the last quarter of FY 1977 point to an upturn in Federal Government business in FY 1978 and beyond. A return to historical growth levels overall is forecast for FY 1978. The majority of contract services' annual revenues stem from multi-year contracts which provide a stable revenue base.
- Specific projects include facilities management for Federal, county, and local government agencies as well as commercial enterprises; development and integration of computer communications systems for the armed forces; and software design and development for NASA's space program.

- INFONET

- INFONET is the most rapidly growing and most profitable part of CSC. It offers remote computing and interactive services with a broad range of software. It is used by government and commercial clients for business planning and control, engineering and statistical analysis, and data management.
- Infonet revenues grew from \$37.9 million in 1975 to \$48.4 million in 1976, a 28% growth. FY 1977 INFONET revenues were \$57.7 million, a 19% growth over 1976. FY 1977 operating income was \$13.7 million, up 25% over \$11 million in 1976.

COMPANY HIGHLIGHT/COMPUTER SCIENCES CORPORATION

- Distribution of INFONET personnel is estimated as follows:

Marketing	37%
Administration	17
Research & Development	4
Operations	<u>42</u>
	100%

INDUSTRY MARKETS

● Contract Services

- CSC's 1977 Contract Services business was derived from the following industries:

Total Federal		65%
NASA	25	
Navy	22	
Air Force	6	
Defense Comm. Agency	4	
Other Federal	8	
State & Local		8
Commercial		7
International		<u>20</u>
TOTAL CONTRACT SERVICES		100%

● INFONET

- INFONET's 1977 revenues can be split as follows: Federal Government 61%, commercial 39%. Because of greater emphasis on the commercial sector and a change in the Federal Government procurement practices for remote data processing services, the proportion of commercial services will grow.
- Infonet's 1977 revenues are divided as follows:

Government:	61%
GSA	22%
Army	9
Navy	6
Agriculture	4
HUD	3
Postal Service	2
Other	15

COMPANY HIGHLIGHT/COMPUTER SCIENCES CORPORATION

Commercial:	39%
Services	13%
Manufacturing	12
Utilities/Trans.	5
Insurance/Fin.	4
Other	5
	<hr/>
	100%

GEOGRAPHIC MARKETS: CSC has more than 80 locations throughout the world. Principal offices are in Falls Church, VA; El Segundo, CA; Montreal, Canada; and Brussels, Belgium.

COMPUTER HARDWARE AND SOFTWARE INFONET service is based on CSC's proprietary software, Computer Sciences Teleprocessing System (CSTS), which operates on Univac equipment. In 1977, CSC utilized 11 Univac 1108 computers in its U.S. network. In FY 1978, CSC plans to offer service on IBM 370 equipment as a supplemental capability to CSTS.

COMPANY HIGHLIGHT

COMSHARE INC.
3001 So. State Street
Ann Arbor, MI 48106
(313) 994-4800

Richard L. Crandall, President
Public corporation, OTC
Total employees: 450 (U.S.)
Total revenues, fiscal year-end
6/30/76: \$13.8 million
6/30/77: \$18.2 million

THE COMPANY

- COMSHARE, primarily a remote computing services vendor, increased its revenues from \$12.3 million to \$13.7 million between 1975 and 1976, a growth of 11.4%. The 1977 U.S. sales reached \$18.2 million a growth between 1976 and 1977 of 32%.
 - Eleven percent, or \$2.0 million, of the 1977 revenue increase resulted from two acquisitions:
 1. Trilog, specializing in computer-based employee benefit administration and reporting services.
 2. Systematic Computer Systems, Inc., specializing in tax return processing.
 - After-tax earnings rose to \$1,475,000 in 1977, a 105% growth over the \$720,000 in 1976. Earnings per share during the same period rose 83% from \$.52 to \$.95 with average outstanding shares of 1,548,000.
- Unconsolidated 1977 overseas revenue from affiliated companies brought total revenues for the entire COMSHARE group to \$30.7 million. Equity in earnings of affiliated companies was \$66,000 in 1977 compared with the 1976 loss of \$129,000.
- COMSHARE is making a major effort:
 - To focus its resources on specialized markets and applications.
 - To expand overseas by developing local operations in each country.
 - To maximize the value-added in each of the services it provides.

KEY PRODUCTS AND SERVICES

- COMSHARE specialty products include:
 - COMPASS, generating \$2.7 million in revenues. It provides professional accounting services to accounting firms. It is used by over 1600 accounting firms, including 28 of the 30

COMPANY HIGHLIGHT/COMSHARE INC.

largest CPA firms in the country. COMSHARE has been selected by the American Institute of CPA's as the source of professional national program library services. Functions performed include general ledger, project accounting, internal time and billing, staff scheduling, auditing, and tax processing.

- 4.1.1 Systems, for Telephone Equipment Inventory and Number Assignment, generating \$2.2 million. Designed for telephone companies, it balances central switching office traffic and manages, assigns, and forecasts central office equipment. It is used by six of the 19 Bell Telephone operating companies and by two of the 10 major independent telephone companies.
- Human Resource Management software, PRO/FILES and EBS, generating \$2.3 million revenues. PRO/FILES is a human resource management system designed for personnel managers to create inventories of employee skills, perform statistical analysis, forecast manpower requirements, and prepare reporting information required by the EEO and Affirmative Action. EBS is a product for employee benefit record keeping and administration and is sold primarily to corporate clients and banking institutions.
- COMSHARE's financial products and services, including its replacement cost accounting software, VSCOM-190, generate \$1.6 million in revenues.

APPLICATIONS Specialty applications are COMSHARE's primary source of domestic revenues in 1977, as shown below:

	<u>1977 \$U.S.</u>	<u>% Total U.S.\$</u>
Specialty	\$ 8.8m	48%
Data base management	5.8	32
Utility	<u>3.6</u>	<u>20</u>
	\$18.2	100%

INDUSTRY MARKETS COMSHARE markets to a wide variety of industries. Its industry-specific accounting and telephone company product lines along with two industry-independent personnel and financial product lines generated approximately 50% of 1977 revenues. Remaining revenues are derived from generalized and data management services.

GEOGRAPHIC MARKETS Fifty-four cities across the U.S., Canada, Europe and Japan. U.S. revenues are spread throughout the country with some concentration in Washington and Montana.

COMPANY HIGHLIGHT/COMSHARE INC.

COMPUTER HARDWARE AND SOFTWARE

- COMSHARE's network of 78 Interdata minicomputers and Xerox Sigma 9's provide remote computing services utilizing proprietary software called Commander II. The Commander I service is supported by 10 Xerox 940's. The company also has an IBM 360/65 in Philadelphia. A cable link to the company's European affiliate's data center in London, England enables international customers to access Commander II services on either side of the Atlantic.
- The company and its international affiliates operate four data centers: Ann Arbor, London, Tokyo, and Toronto.
- COMSHARE will be required to upgrade the 940s and the Sigma 9's in the long-term future. Although Xerox is no longer in the computer business, Sigma 9 systems are still available and the company foresees no problems in acquiring additional systems for capacity needs. The company will make future decisions with regard to procuring new or additional equipment types based on product-line need. This will necessitate upgrading its current IBM equipment. procuring minicomputer systems where economically feasible and purchasing additional Sigma 9's or other mainframe and peripheral equipment that can be made compatible with Sigma 9 systems.

COMPANY HIGHLIGHT

DATA RESOURCES, INC.
29 Hartwell Avenue
Lexington, MA 02173
(617) 861-0165

Otto Eckstein, President
Public corporation
Total employees: 360
Total revenues, fiscal year
end 12/31/76: \$17.1 million

THE COMPANY

- Data Resources, Inc. (DRI) was founded in 1968 by Otto Eckstein and Donald B. Marron as an econometrics consulting and services organization. In 1976, it became a publicly-held corporation with the sale of 300,000 shares of common stock.
- DRI's revenues increased 35% between 1975 and 1976, from \$12.7 million to \$17.1 million. Net income during the same period increased 70% from \$884,000 to \$1.5 million.
- The company employs over 300 people; more than 200 have advanced or bachelor's degrees. They are segmented as follows:
 - Forecasting and model building 33%
 - Service consulting 28%
 - DP and internal computational activity 17%
 - Administrative and clerical 16%
 - Marketing 6%
- Competing in narrow segments with DRI are companies such as Chase Econometric Associates, Inc. and Wharton E.F.A., Inc. DRI management claims DRI has 75% of the market shared by DRI, Wharton, and Chase.

KEY PRODUCTS AND SERVICES

- DRI 1976 revenues were derived principally from subscriptions and associated data processing, as shown below:

	<u>1976 \$</u>	<u>% of Total \$</u>
- Subscription fees	6.2M	36%
- Associated data processing service	9.6M	56%
- Consulting	1.3M	8%

- DRI offers three basic subscription programs. All include interactive access to DRI's data base, written reports, and consulting services. The three basic programs are:

COMPANY HIGHLIGHT/DATA RESOURCES, INC.

- Macro-economic models and forecasting for the U.S., Canada, Europe (EEC countries) and Japan. Price: \$5,000 to \$19,000 per year.
 - Micro-economic models and forecasting for particular U.S. industries, U.S. geographic regions, inflation rates, and exchange rates. Price: \$6,000 to \$40,000 per year.
 - Custom models where DRI combines relevant parts of existing macro- and micro-economic models with information tailored to the needs of a specific corporation or industry. (For example, the custom model for an individual electric utility combines data from the U.S. macro-economic model, micro-economic models of U.S. regions and the energy industry, and specific utility company data not available through the standard models.) Price: \$50,000 to \$150,000 per year.
- The macro-economic service is the basic service to which all clients subscribe. These models are used to forecast such things as household flow of funds and money sources for the corporate financial sector. Other programs are add-ons to this service.
 - Typical micro-economic models include: energy, cost forecasting, agriculture, steel, and consumer product and industry financial information. These models are frequently combined. The most common pairs are: petrochemical/agriculture; steel/energy; cost forecasting/insurance; and energy/regional U.S.
 - The fastest growth areas for the company are special data base and forecasting services in areas such as agriculture, consumer products, and steel. The newest data bases and models are for the pulp and paper industry, fertilizer, and sugar.
 - DRI is developing several new products, including additional micro-economic models and international extensions of current micro-and macro-services.

APPLICATIONS All DRI services are econometric models and forecasting services which have specialty applications.

COMPANY HIGHLIGHT/DATA RESOURCES, INC.

INDUSTRY MARKETS

- Of DRI's 600 total clients, 350 to 400 are large corporations or manufacturers (steel, petrochemical, oil, construction, and food); another 150 to 200 are financial institutions (insurance, banks, brokerage houses), and the remainder are U.S. and international government agencies and universities.
- The company averages over \$30,000 in revenues per client.

GEOGRAPHIC MARKETS DRI has clients worldwide. Its major revenues sources, however, are Chicago, Pittsburgh, New York, Washington DC, Houston San Francisco, and Boston. Branch offices are located in New York City, Washington DC, Pittsburgh, Chicago, Houston, San Francisco, Toronto, and Brussels.

COMPUTER HARDWARE AND SOFTWARE

- DRI uses a Burroughs B7700 mainframe with four central processors.
- Its network is a combination of dial-up, leased, and IN-WATS lines in addition to TYMNET and TELENET. DRI's network covers the U.S. and extends to London, Brussels, Paris, Geneva, Frankfurt, Amsterdam, Milan, Mexico City, and Canadian cities.
- The network supports hard copy, graphics, and remote job entry terminals; and FORTRAN, APL, BASIC, PL/1, ALGOL, and COBOL computer languages.

COMPANY HIGHLIGHT

ELECTRONIC DATA SYSTEMS CORPORATION
7171 Forest Lane
Dallas, TX 65230
(214) 661-6000

Ross Perot, President and
Chairman of the Board
Public corporation
Total employees: 6,386
Total sales, fiscal year end,
6/30/77: \$164,188,000

THE COMPANY

- Electronic Data Systems Corporation (EDS) was founded in June 1962 by Ross Perot, currently Chairman of the Board and Chief Executive Officer. It is the premier facilities management (FM) company in the United States, with FM contracts generating approximately 91% of revenues in 1977. (Remaining revenues are derived from interest and the sale of assets.) The company designs and installs software systems and operates computer facilities for its customers.
 - Approximately \$70 million in fiscal year 1976, or 52% of total revenues is derived from processing of Medicare, Medicaid, and CHAMPUS. Contracts between EDS and its customers generally have 5-10 year terms.
 - Other revenues are derived from commercial banks, savings and loan institutions, credit unions, and retailers.
- Between 1976 and 1977, revenues grew from \$132.9 million to \$164.2 million, an increase of 23%, while earnings increased 21% from \$13.6 million to \$16.4 million. The company has been a major cash generator. In the last year its cash or cash equivalent position grew from \$42 million to \$55 million while the company paid \$7.5 million in dividends.
- Recently, EDS has begun to bid not only on insurance processing contracts but also fiscal agent and intermediary contracts. Thus, EDS has become the insurer and administrator on the new contracts and has assumed total operating responsibility for the customers' data processing installations as well.

COMPANY HIGHLIGHT/ELECTRONIC DATA SYSTEMS CORPORATION

- EDS's major strengths are its ability to hire, train, mobilize, and manage people. This ability has helped it to add large segments of business without a deterioration in service.
- Another asset of the company is the software which has been developed for the health care and the financial industry. To date, \$50 million of software development costs have been expensed. Portions of this software can frequently be utilized in new installations providing the company with the opportunity to leverage the software.

KEY PRODUCTS AND SERVICES

- Of the \$133 million of revenues in FY 1976, \$70 million was derived from data processing of Medicare, Medicaid, and CHAMPUS. This business represents a major source of revenue for EDS. Exhibit #1 shows recent EDS contracts.
- California accounts for almost 1/3 of EDS health insurance processing revenues with the following breakdown:

- Medi-Cal	\$13 million
- Medicare	6 million
- CHAMPUS	<u>1 million</u>
TOTAL	\$20 million
- EDS' dominance of the health insurance market is both its greatest asset and liability
 - Its experience and competence is an obvious asset. It currently handles 20% of all claims processing for state health-care programs across the nation.
 - Recently EDS has received court challenges from low bid competitors which lost contracts to EDS, and from some state aid federal government agencies. These challenges may provide competitors with opportunities to enter EDS-dominated markets.
- Of EDS's 6386 employees, 50 are salesmen.

APPLICATIONS EDS offers primarily health care processing applications, although it also offers financial applications.

GEOGRAPHIC MARKETS EDS processes for state government agencies and corporations throughout the U.S. as well as servicing governments in the Middle East.

COMPUTER HARDWARE AND SOFTWARE

- EDS operates 62 computers in its operations. They are mostly IBM mainframes, except for several Burroughs, and two Honeywell systems.
- The equipment is located in computer centers in Michigan, Connecticut, Massachusetts, New York, Vermont, Pennsylvania, Illinois, Ohio, South Carolina, Texas, Wisconsin, Florida, California, Oregon, North Carolina, Puerto Rico, Washington, and Arkansas.

EXHIBIT 1

EDS' RECENT CONTRACTS FOR MEDICARE, MEDICAID, AND CHAMPUS

YEAR	STATE	PROGRAM	COMMENTS	DURATION
Nov. 1975	Washington State	Medicaid	Full EDP service including on-line claims examination	2 years
June 1976	Alabama	Medicaid	Full FI* & EDP service	1 year
June 1976	Indiana	Medicare	Full EDP service	28 months
July 1976	Washington State	Medicaid	Nov. 75 contract extended to 5 years	5 years
August 1976	Texas	Medicaid	Full FI* & EDP service on risk. Approx. \$250 million/year	4 yr. 8 mo.
August 1976	Florida	Medicare	EDP facilities management only	3 years
Sept. 1976	Idaho	Medicaid	Full FI* & EDP service No risk	2 yr. 6 mo.
Sept. 1976	Iran		Turnkey implementation of complete social security. Approx. \$40 million revenue	3 years
Oct. 1976	Massachusetts	Medicare	Contract renewed to implement AMS	3 years
Dec. 1976	California Oregon Nevada Arizona Utah	CHAMPUS	EDP service only. This contract was taken away from HAS for poor performance and awarded to California Blue Shield and EDS.	Month-to-Month
Jan. 1977	North Carolina	Medicaid	EDP service only. Replaces HAS	Drugs-FY '78 Other-6/77
June 1977	New Mexico	Medicaid	Replaces Dikewood Industries	3 years

* Fiscal Intermediary

COMPANY HIGHLIGHT

ITEL DATA SERVICES GROUP
3 Corporate Drive
White Plains, NY 10604
(914) 694-8800

William Bird, President
Wholly owned subsidiary
of Itel Corporation
Total employees: 950
Total revenues, fiscal
year end 12/31/76:
\$41,900,000

THE COMPANY

- ITEL Data Services Group (DSG) offers packaged batch and on-line data processing services to 11,000 clients in a variety of industries, including manufacturing, wholesale, retail, banking, law, trucking, architecture, accounting, and engineering. It also provides management and other information services.
- DSG revenues increased from \$25.9 million in 1975 to \$41.9 million in 1976, a growth of 62%. Earnings during the same period jumped more than 80% from \$2.2 million to \$4.0 million.
- The Data Services Group is highly acquisition-oriented. Four companies acquired in December 1976 will almost double DSG revenues in 1977. In addition, each acquisition has enabled the company to enter a new market area. The acquisitions and their markets are as follows:

<u>Name of Company</u>	<u>Markets/Products</u>	<u>Estimated 1977 Revs.</u>
Computer Dimensions	On-line inventory control and accounting functions for auto dealers, credit unions, and insurance agents. (Centers in Dallas, Detroit, and L.A.)	\$20M
AutEx Inc.	Block securities trading information services for brokerage and institutional investors.	\$ 8M
Utility Network of America	On-line scientific computation using Univac 1108 systems	\$ 7M
Tax Accountants Computer Services	Computerized tax computation services for accountants.	\$ 2M

August 1977

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COMPANY HIGHLIGHT/ITEL DATA SERVICES GROUP

- In addition, DSG acquired Multiple Access, Inc. in April 1977. Multiple Access provides remote batch network information services.
- The major challenge facing management is to integrate the acquired companies effectively to obtain the benefits of economies of scale without destroying the entrepreneurial spirit which got the companies started.

KEY PRODUCTS AND SERVICES

- In 1976, 68% of DSG revenues were derived from the sale of batch processing and 32% from on-line processing.
 - The average annual revenues from an on-line client in 1976 were nearly ten times greater than the average revenues of an off-line client (\$31,000 versus \$3,311).
 - Since 1972, on-line clients have shown a compound growth of 100% in both revenues and numbers. In contrast, off-line clients have grown only 31% in revenues and 43% in numbers during the same period.
- By fiscal year end 1977, DSG expects to have 1,400 employees and 18 data centers. Revenues will be segmented as shown below:

<u>Service</u>	<u>% of Total Revenues</u>
Commercial Data Services (accounts receivable, payroll, general ledger)	42%
Transportation Data Services (motor freight, auto dealers)	22%
Financial Data Services (commercial banking services, savings, block trading)	14%
Business Forms	9%
Scientific Data Services	7%
Insurance Data & Network Data Services	<u>6%</u>
	100%

August 1977

COMPANY HIGHLIGHT/ITEL DATA SERVICES GROUP

- Its 950 employees in 1976 were distributed as follow:

OPERATIONS	60%
TOTAL MARKETING	22%
Sales	6
Marketing	16
ADMINISTRATION	10%
R&D	<u>8%</u>
	100%

APPLICATIONS DSG concentrates on general business applications. It is one of the largest processors of general ledger and financial statements for accountants and the business community. In addition, it provides inventory control, sales analysis, and bill of materials processing applications.

INDUSTRY MARKETS The company's major revenues are derived from the distribution industry, as shown below:

Distribution-wholesale	60%
Manufacturing-discrete	20%
Banking	10%
Transportation	<u>10%</u>
	100%

GEOGRAPHIC MARKETS DSG has offices in White Plains, Dallas, Wellesley, New York City, Salt Lake City, and Pittsburgh. Computer Dimensions, its subsidiary, has data centers in Dallas, Detroit, and Los Angeles.

COMPUTER HARDWARE AND SOFTWARE DSG maintains 18 computer centers throughout the U.S., including a central center in White Plains. This central site has two IBM 370/155 and one IBM 360/65 mainframes. ITEL will shortly replace the IBM 360/65 with an ITEL AS-5 system.

August 1977

COMPANY HIGHLIGHT

KEYDATA CORPORATION
20 William Street
Wellesley, MA 02180
(617) 237-6930

L. Edwin Donegan, Jr. President
Public corporation, OTC
Total employees: 292
Net operating revenues, fiscal
year end 7/31/76: \$14,878,000

THE COMPANY

- Keydata provides interactive processing services via its nationwide network to its distribution and manufacturing clients.
- Between 1975 and 1976, revenues increased 10% from \$13.5 million to \$14.9 million. Net income increased 144% from \$453,000 to \$1.1 million. (Before extraordinary credits of \$200,000 in 1975 and \$515,000 in 1976, income rose 133%.) Earnings per share were \$.21 before and \$.40 after an extraordinary credit; 2.7 million shares were outstanding.
- Revenues in the first three quarters of FY 1977 were down slightly over 1976 at \$10.8 million compared to \$11.1 million with a 1977 nine month net income of \$157,000 as compared to \$371,000 in 1976. The company expects higher revenues and profits in late FY 1977 and all of FY 1978.
- Three factors contributed to this decline in revenues:
 - recruiting and training of new sales staff
 - competition from small business computers
 - slow down in US economy
- The company indicates that the number of new customers acquired and the backlog of revenues are the highest in its history.
- Major competition for Keydata comes from Xerox Computer Services and small business computers, although management believes that the activity and interest generated among small companies by small computer vendors is beneficial to Keydata's growth. At present, customer revenues lost are being kept to approximately 15% of annual revenues.

COMPANY HIGHLIGHT/KEYDATA CORPORATION

- The company's 292 employees are distributed as follows:

Operations/Applications Development and Programming	40%
Marketing and Sales Support	40%
Administration	20%

KEY PRODUCTS AND SERVICES

- The company offers interactive and remote computing services to 316 users. Half its revenues are derived from small single location firms; the other half from multi-location users. Customers spend an average \$45,000 per year for Keydata services.
- Keydata has two major types of online services:
 - Distribution accounting for large multi-location clients with sophisticated requirements. It includes financial reporting, order entry, automatic back order systems, purchase order systems, inventory management, accounts payable, and general ledger.
 - System 800, a packaged-price product providing automated business applications for manufacturers and distributors with annual sales of \$750,000 to \$5 million. Priced at a flat \$800 per month, System 800 is targeted to compete with small business computers. The packages include billing, inventory control, accounts receivable, and sales analysis.
- System 800 has made a significant contribution to Keydata's sales momentum although it has only 20 users currently. Approximately 40% of new sales are a result of activity initiated by customers interested in the System 800.

APPLICATIONS Keydata provides general business applications to its users. Specific applications include purchase order, inventory control, accounts payable, accounts receivable, general ledger, order entry, financial reporting, invoicing, and sales analysis.

INDUSTRY MARKETS The wholesale distribution industry generates 75% and the manufacturing industry 25% of Kaydata revenues.

GEOGRAPHIC MARKETS

- More than half of Keydata's revenues are derived from

COMPANY HIGHLIGHT/KEYDATA CORPORATION

the East Coast, as shown below:

Northeast	25%
New York	30
Mid-Atlantic	15
Midwest	15
Canada	15

- Keydata offices are located in Atlanta, Boston, Chicago, Clifton (NJ), Hartford, Miami, New York, Philadelphia, Syracuse, Toronto, Wellesley, and Miami.

COMPUTER HARDWARE AND SOFTWARE

- Keydata uses three Univac 494s and one DEC PDP 10 located in its Foxboro, Massachusetts computer center. Dedicated communications lines are tied to 48 data communication concentrators in 29 cities in the U.S. and Canada.
- In 1976, the company introduced its Keydata Cluster Controller (Model KCC-1), a specially designed data communications concentrator which enables users to connect up to five Keydata terminals at a single location to its communications network. Management claims this product reduces user telephone charges by as much as 50% per month.

COMPANY HIGHLIGHT

NATIONAL CSS, INC.
542 Westport Avenue
Norwalk, CT 06581
(203) 853-7200

Robert E. Weissman, President
Public corporation, AMEX
Total employees: 692
Total revenues, fiscal year
end 2/28/77: \$41.7 million

THE COMPANY

- Founded in 1967, National CSS, Inc. (NCSS) is primarily a remote computing services firm providing predominately utility services to more than 9500 users in over 100 cities in North America and Europe. Raw time, also available over the network, is not marketed by NCSS.
- Between 1976 and 1977 revenues grew 17% from \$35.6 million to \$41.7 million while net earnings grew 49% from \$2.1 million to \$3.2 million.
- This increase in profitability is part of a conscious effort to leverage investment in hardware and software through expansion of the customer base. The success of this strategy is reflected in steadily increasing pretax and net earnings in 1976, 1977, and first quarter 1978. Net earnings for 1977 were additionally increased because of an investment tax credit obtained for the 1976 purchase of an Amdahl 470 V/6 system.
- In 1974, NCSS acquired TBS computer centers and its subsidiary RTW Computer Network. Since 1974, NCSS has not acquired any companies although it has an extremely active program of identifying potential candidates.
- The company has almost 700 employees; half of whom are in marketing or marketing-related functions, 34% in administrative functions, and 16% in operations.
- During the last year, NCSS has concentrated on the following developments:
 - Adding to the number of NOMAD users.
 - Increasing profits and revenues.
 - Purchasing the Amdahl V/6.
 - Increasing new sales offices by 20%
 - Bringing a new product to market: EMS (Economic Modeling System).
 - Entering into an agreement with Merrill Lynch to enable NCSS users to access several economic data bases developed by Merrill Lynch.

COMPANY HIGHLIGHT/NATIONAL CSS, INC.

KEY PRODUCTS AND SERVICES

- Ninety-three percent of NCSS annual revenues were derived from the sale of remote computing services. The remainder came from facilities management and professional services contracts.
- The company's most significant product is NOMAD, a relational data base management system introduced in 1976. It is currently generating revenues at a rate of \$800,000 per month.
- The growth of NOMAD users is best illustrated by the following table showing the growth in NOMAD revenues since 1976.

FY 1976

1st Quarter	\$ 21,000
4th Quarter	359,000

FY 1977

1st Quarter	649,000
4th Quarter	1,388,000

FY 1978

2nd Quarter	\$1,800,000 (E)
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- EMS a financial modeling language is a software system providing capabilities to manage and display economic and financial information. It also constructs and simulates econometric corporate and other models. The EMS file structure and access procedures can handle shared, restricted, or private files as well as models, reports, and programs. EMS allows the customer to design reports including tables and graphs of any desired format using a command language which does not require knowledge of programming.
- Infotab is another financial modeling language which is used to prepare tables, forecasts, and analytical reports. Simple to use, the tables are prepared, stored, and modified when necessary on a KB CRT.
- The data bases obtained through Merrill Lynch, used with EMS, provide a powerful econometric tool.
- Other packages offered by NCSS include:
 - SPX, a statistical package
 - RAMIS, a data base management system
 - MARK IV, a data base management system
 - ISPICE, an integrated circuit design

COMPANY HIGHLIGHT/NATIONAL CSS, INC.

APPLICATIONS The company's primary source of revenues is utility processing (50%). General business and specialty applications processing each generates 14%. Remaining revenues are derived from scientific and engineering applications (15%), facilities management (5%), and systems design (2%).

INDUSTRY MARKETS Although NCSS revenues are derived from a variety of industries, discrete manufacturers provide more revenues than any other single industry, as shown below:

Manufacturing-discrete	29%
Manufacturing-process	4
Utilities	18
Insurance	7
Banking and finance	6
Services	6
Distribution-retail	3
Distribution-wholesale	1
Transportation	2
Other	24%

GEOGRAPHIC MARKETS NCSS has a 60,000 mile network reaching more than 100 cities in North America and Europe. The majority of its total revenues are derived from the Eastern and Western U.S., as shown below:

New England	19%
Northeast	36
Southeast	4
North Central	0
Midwest	7
Mountain	0
Pacific Coast	32
International	2%

- NCSS has offices in Atlanta, Cambridge, Chicago, Cleveland, Dallas, Denver, Detroit, Elizabeth (NJ), Hartford, Houston, Los Angeles, Minneapolis, Newport Beach, New York, Philadelphia, Phoenix, Pittsburgh, Portland, San Diego, San Francisco, Santa Clara (CA) Stamford (CT), and Washington D.C. as well as in London and Paris.

COMPANY HIGHLIGHT/NATIONAL CSS, INC.

COMPUTER HARDWARE AND SOFTWARE

- NCSS purchased an Amdahl 470 V/6 to replace rented IBM equipment in one of its Stamford, Connecticut data centers. It has provided the company with a major increase in capacity without a significant increase in equipment expenditures and without a modification to the site.

- NCSS also has the following equipment in its four data centers:
 - Sunnyvale, CA IBM 370/168
 IBM 370/158
 - Stamford, CT IBM 370/168
 Amdahl 460 V/6
 - RTW Los Angeles, CA Half Duplex IBM 360/67
 - TBS New York, NY IBM 360/30
 IBM 360/40
 IBM 360/50

- The network is composed of IN-WATS and dial-up lines.

COMPANY HIGHLIGHT

NATIONAL DATA CORPORATION
One National Data Plaza
Corporate Square
Atlanta, GA 30359
(404) 325-3311

George W. Thorpe, Chairman of the Board
L. C. Whitney, President
Public corporation, OTC
Total employees: 1400
Total revenues, fiscal year end 5/31/77: \$34,986,000

THE COMPANY

- National Data Corporation (NDC) provides specialized remote computing and facilities management services. Key services include credit card authorization and billing services, primarily for petroleum industry customers. The company also provides cash management, hotel reservation, and merchandise ordering services.
- Revenues of the company have been almost static since 1974, going from \$30.6 million in 1974 to \$32.9 million in 1976. Net income between 1973 and 1977 grew from \$1.9 million to \$2.3 million, a growth of 24% in five years. The company has no outstanding debt and has an excellent cash position.
- NDC has 1400 employees segmented as follows:

6 Regional Centers	48%
ARCO Contract	32
Operations	7
Marketing	5
R&D Programming Support	5
Administration	3
	<u>100%</u>
- Major competition comes from Automatic Data Processing, General Electric, and Rapidata.

KEY PRODUCTS AND SERVICES

- NDC services and the (unaudited) revenues it derived from them in 1977 are as follows:

- Cash management services	\$ 7,611,000
- Bank credit card authorization services	6,013,000

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August 1977

COMPANY HIGHLIGHT/NATIONAL DATA CORPORATION

- Reservations and Merchandise ordering	\$ 1,848,000
- Terminal access	1 145,000
- Credit card billing other than petroleum	1,097,000
- Petroleum billing and authorization services :	
Atlantic Richfield Company credit card billing	13,914,000
Petroleum credit card authorization services	2,760,000
- Other	<u>598,000</u>
TOTAL	\$34,986,000

- Cash management is now one of the company's largest services and a growing market segment. More than 1,000 companies with numerous chain stores are able to keep up with combined daily cash receipts through a deposit reporting service. The service is offered through more than 100 banks in the U.S. and Canada.
- Services offered over NDC's high speed communications network in the U.S. and Canada include:
 - Credit card charge authorization: used by oil companies, airlines, retail chains, and certain Interbank/Master Charge and VISA (formerly BankAmericard) issuing banks. This service is used by 29 petroleum companies.
 - Sales draft processing: clearing house services for processing credit card sales tickets, including sorting, processing, balancing, and reconciling sales drafts supplied by retailers who accept bank credit cards. (Includes National Billing Systems, Inc. revenues).
 - Subsidiary, National Billing Systems, Inc.: billing-related services to Atlantic Richfield on an FM type contract. Services include billing and collection, processing of invoices, preparation of related reports, and related functions such as customer relations and promotional merchandise sales mailing. NDC predicts that the percent of revenues derived from this contract should be reduced to 15% of total revenues by 1981.
 - Bank deposit and bank balance reporting service: a rapidly growing service which enables financial officers of corporate customers of participating banks to receive daily bank balance information. This facilitates more rapid cash management decisions. These services account for 22% of 1977 revenues and are growing at a 29% annual rate.

COMPANY HIGHLIGHT/NATIONAL DATA CORPORATION

- Consumer services: catalog and phone ordering, hotel and motel reservation service, and a locator and prospecting system for automobile manufacturers. Accounts for 5% of revenues.
- NDC performs FM services for banks and airlines. In addition, NDC has signed an extended term contract with Security Pacific National Bank of California to install and maintain a POS authorization network.
- In January, 1977 NDC entered the health care field by acquiring a pharmacy management system drug interaction guide developed at the Medical University of South Carolina. There are approximately 40-50 users of this pharmacy system.
- The company also has an agreement with Comshare, Inc., which enables NDC to offer interactive services to its users over Comshare's network.

APPLICATIONS NDC offers primarily industry specialized applications.

INDUSTRY MARKETS The company services a variety of industries, including petroleum, banking, retail, services, medical, and manufacturing.

GEOGRAPHIC MARKETS The company services clients nationwide through 12 sales offices, which include New York, Pittsburgh, Chicago, Atlanta, Dallas, Los Angeles, San Francisco, and Toronto. In addition, communications centers are located in Atlanta, GA; Cherry Hill, NJ; Reno, NV; Toronto, OT, Canada; and Westchester, IL. Clients are concentrated in the major financial centers.

COMPUTER HARDWARE AND SOFTWARE NDC operates three Univac 494s, two Univac 9400s, and one Burroughs 6700.

COMPANY HIGHLIGHT

ON-LINE SYSTEMS, INC
115 Evergreen Heights Drive
Pittsburgh, Pennsylvania 15229
(412) 931-7600

Jack Roseman, President
Public Corporation, AMEX
Total employees: 290
Total revenues, fiscal year
end 4/30/77: \$16,001,020

THE COMPANY

- On-Line Systems Inc. (OLS) was founded in Pittsburgh in 1967 by John Godfrey and others to provide remote computing services to business and government. It was incorporated in Delaware.
- The company now provides remote computing and batch processing, facilities management, and professional services to commercial and government clients.
- Revenues of \$16 million for FY 1977 increased approximately 33% over the \$12 million revenues for FY 1976. The 1976 revenues represented only a marginal increase over \$11,433,706 revenues in FY 1975. Net income increased approximately 62% from \$816,211 in 1976 to \$1,345,537 in 1977 after declining 41% from \$1,252,927 in 1975. Even with the decline, OLS's 1976 net income equaled 11% of revenues and rose to 14% in 1977. Earnings per share rose from \$.97 in 1976 to \$1.56 in 1977 with an average of 860,582 shares outstanding.
- OLS's improved performance in 1977 resulted from two factors: a \$2.2 million contract with HEW's Office of Education (part of a multi-year contract with HEW) and expansion of new and existing business.
- Since the start of FY 1978, OLS's Board of Directors have declared the company's first two \$.05 cash dividends.
- OLS's 290 employees are functionally distributed as follows:

- Marketing	48%
- Computer Svcs (software and special projects)	19
- Operations	19
- Administration	<u>14</u>
	100%

COMPANY HIGHLIGHT/ON-LINE SYSTEMS, INC

- Major competitors include General Electric Information Services Business Division, Control Data, DEC-based interactive services companies and in-house systems.

KEY PRODUCTS/SERVICES:

- Interactive processing services and facilities management contracts generated approximately 90% of revenues in 1977. The remaining 10% were derived from professional services.
 - Interactive processing produced 61% of total revenues.
 - Remote and on-site facilities management contracts provided 29% of 1977 revenues.
 - Professional services (consulting, systems design, and contract programming) are generally provided for existing and potential processing clients only.
 - OLS has a total of approximately 600 clients and 2,900 terminal users.
- The company markets more than 800 library programs and supports 16 computer languages. Its products, OLIVER, OSCAR, and IMS, total several hundred installations. These and other OLS programs are listed below:
 - OLIVER, a data base management system.
 - FMS, a Financial Modeling System for corporate analysis and forecasting.
 - OSCAR, a project scheduling and control system.
 - SHURE, System for Human Resources, a personnel management system
 - MOP, Melt Optimization Program, a linear programming system for the metals processing industry.
 - GDS, an interactive graphics control system
 - TEXT, a computerized text editing and document preparation system.
 - Stock dividend and price data bases

APPLICATIONS

- Approximately 65% of OLS's 1977 processing applications revenues were derived from utility processing, as shown below:

Utility	65%
Specialty	25
General business	5
Scientific and Engineering	<u>5</u>
	100%

COMPANY HIGHLIGHT/ON-LINE SYSTEMS, INC.

- Both industry-specialized and discipline-specific specialty applications are available. They are provided through custom software developed to fulfill unique client requirements.

INDUSTRY MARKETS

- In FY 1977, government agencies generated 36% of total OLS revenues, up from 21% in 1973. Of this, the HEW contract provided 20% in 1976 and 29% in 1977. Commercial users generated 63% of total 1977 revenues, as follows:

- Government:		36%
Federal	32	
State and Local	4	
- Manufacturing		33
- Banking and Finance		18
- Services		8
- Transportation		2
- Distribution: Retail		1
- Utilities		1
- Insurance		1
		<u>100%</u>

GEOGRAPHIC MARKETS

- OLS services are marketed through the company's 16 sales offices located in: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Houston, Los Angeles, New Jersey, New York City, Philadelphia, Pittsburgh, Rochester, and Washington, D.C.
- Client population follow U.S. demographic concentration with the majority in the Eastern regions

COMPUTER HARDWARE AND SOFTWARE

- OLS has 16 DEC KI/10s (14 in the Pittsburgh center and two at a user site) for processing and 31 DEC PDP-11/45s for network support. At FYE 1977, the computer equipment was operated at 80% of capacity. It has an uninterruptable power supply and a dual power backup system.

COMPANY HIGHLIGHT/ON-LINE SYSTEMS, INC.

- The network consists of local dial-up, leased, and IN-WATS lines to 33 cities including all branch office cities in addition to: Arlington, VA; Clifton, NJ; Denver, CO; Elmira, NY; Fort Worth, TX; Kansas City, MO; Milwaukee, WI; St. Louis, MO; San Antonio, TX; San Francisco, CA; Seattle, WA; and London, England; as well as Calgary, Halifax, Toronto, Vancouver, and Winnipeg, Canada.

COMPANY HIGHLIGHT

RAPIDATA, INC.
 20 New Dutch Lane
 Fairfield, NJ 07006
 (201) 227-0035

Robert J. O'Brien, President
 Public Corporation, OTC
 Total employees: 340
 Total company sales, fiscal
 year end 12/31/76: \$15,623,939

THE COMPANY

- Rapidata, Inc. provides interactive processing services to its more than 6000 clients in the utility, industry, and government sectors.
- In 1976, revenues reached \$15.6 million, 6% above 1975 revenues of \$14.8 million, continuing a pattern of steady revenue growth as shown in the chart below:

Rapidata Historical Revenues and Profits

	Revenues	Net Income	Income as % of Revenues
1970	4,375,510	\$ (144,542)	(3.3)%
1971	5,401,463	567,644	10.5
1972	7,684,214	1,086,253	14.1
1973	9,535,161	741,234	7.5
1974	11,511,632	541,237	4.5
1975	14,772,315	1,278,325	8.7
1976	15,623,939	\$ 510,977	3.3%

- During the same period, however, net income declined 150% from \$1.3 million to \$510,977 and net earnings per share of common stock declined from \$.70 to \$.28 with 1.8 million shares outstanding. Even with this decline, earnings were 11% of revenues in 1976 and the company had no senior debt.
- The decline in earnings was basically a result of two factors: increased expenses and equipment costs without comparably increased revenues and increased competitive pressure in Rapidata's specialized market: interactive processing for large corporations in the Northeast. Income was positively affected by a decrease in the effective tax rate from 41% in 1975 to 36% in 1976.
- Since early 1976, Rapidata has been working to expand both its applications and geographic markets. First quarter 1977 revenues, at \$4.415 million, were up 15% over the \$3.844 million in 1976 although net income declined 66% for the same period from \$277,849 (\$.15 per share) to \$167,199 (\$.09 per share). This income decline resulted from a lower than expected investment tax credit for 1977.

COMPANY HIGHLIGHT/RAPIDATA, INC.

- The New York Telephone Company accounted for approximately 30% of revenues in 1976, largely associated with long term contracts expiring in 1978 and 1979.
- In June 1976, Rapidata and ACTS Computing Company signed a two year contract whereby ACTS's users would be serviced through Rapidata computers. In mid 1977, Rapidata acquired ACTS's 200 interactive services clients.
- In late 1976 Rapidata qualified as a Teleprocessing Services Procurement Program (TSP) vendor to the Federal Government. This should aid the company in expanding its Federal revenues. The company has also expanded its financial market customer base through agreements with Bank of America, State Street Bank and Trust Company (Boston), and Pittsburgh National Bank.

KEY PRODUCTS AND SERVICES

- Rapidata offers interactive remote computing services for both dedicated and shared applications. In 1976, approximately 19% of the company's revenues were generated by the sale of dedicated services.
- The company's most successful products are PROVE, FISCAL, X2C, RAPIDLINK, and RAPIDVOICE (all servicemarks of Rapidata). These and other products provide the following services:
 - PROBE: a generalized data management and analysis system designed primarily for forecasting, reporting and plotting. Applications include econometric and financial analysis and market research. It has over 650 installations and has received ICP's \$5 million award.
 - PROBE GRAPHICS: for preparing time-graphs and cross-section diagrams including line graphs, bar graphs, and histograms.
 - FISCAL: an integrated system for financial analysis applications such as capital investment analysis, cash management and forecasting, budget, and performance reporting. ICP \$2 M award.
 - CASH MANAGEMENT SYSTEM: for collecting, analyzing, and reporting data related to management and control of cash. The system uses RAPIDVOICE system.
 - X2C: a user oriented data management service that utilizes sequential, hierarchical, or network data structuring. X2C provides non-procedural report writing and database maintenance capabilities in a high level programming language.
 - RAPIDVOICE: provides capability for touch-tone telephone input and voice response. The service is used for such cross industry applications as order entry, inventory query, and cash management. Users currently number over 50.

COMPANY HIGHLIGHT/RAPIDATA, INC.

- RAPIDLINK: allows users to access computational capabilities of all types of Rapidata computers. The system allows any member of user CPUs to access Rapidata facilities and transfer files. Rapidata facilities can be used as a means of moving data between computers at different user locations.
 - Background-10: a system for production of data processing applications that do not require immediate turnaround. Using this service, jobs run overnight receive 30% reduction from normal time sharing prices.
 - DBMS-10: a generalized data base management system for sequential, tree-structured hierarchical and network structured data bases. It is an extension to COBOL and FORTRAN. DEC also provides DBMS-10 as unbundled software for DEC system 10 installations.
- Additional data bases available include:
- NATIONAL BUREAU OF ECONOMIC RESEARCH: over 2,500 National Economic Data Series; updated daily.
 - FEDERAL RESERVE BANK OF SAN FRANCISCO: over 13,000 series on economic activity of financial institutions, employment, and industry sectors; updated daily.
 - INTERNATIONAL FINANCIAL STATISTICS: national economic and foreign trade data on over 150 countries and regions; updated monthly by the International Monetary Fund.
 - MARKET STATISTICS: features data published annually in Sales Management Magazine's Survey of buying power. Data include 108 types of demographic and economic data for each U.S. county.
 - BAMACS: Bank of America Money And Credit Statistics: consists of current and historical financial statistics. BAMACS is designed to aid corporate treasurers, portfolio managers, and financial analysts in tracking interest rates, and identifying investment and borrowing opportunities. Specific data bases provided include interest rates, financial operating statistics and Federal Reserve flow of funds accounts. Rapidata has an exclusive license to offer this service of the Bank Investment Securities Division of the Bank of America.
 - Programming Services: provides a full range of consulting services including systems definition, computer design with complete implementation and documentation, and concentration on financial applications utilizing latest tools, including mini-systems, as solutions to problems of customers.

APPLICATIONS: Primary revenues are derived from specialty financial applications. Utility and general business applications are also offered.

COMPANY HIGHLIGHT/RAPIDATA, INC.

INDUSTRY MARKETS: Rapidata serves several industries, with some concentration in telephone utilities. Banking, finance, industry, and government markets are also targeted.

GEOGRAPHIC MARKETS: Customers and sales offices are distributed throughout the U.S., including the following cities: Atlanta, Boston, Chicago, Fairfield (NJ), Los Angeles, Melville (NY), Miami, Newport Beach, New York, Palo Alto, Philadelphia, San Francisco, Stamford (CT), and Silver Spring (MD). The company's international headquarters are at Rapidata International Ltd., London, UK.

COMPUTER HARDWARE AND SOFTWARE:

- Computer hardware includes DEC and Honeywell equipment, and customized software:

13	Honeywell	437	custom software
2	DEC	10/70	custom software (Rapidata's TOPS10)
1	DEC	10/80	custom software (Rapidata's TOPS10)
- Early in 1977 Rapidata sold its IBM operations on a favorable basis.

COMPANY HIGHLIGHT

THE REYNOLDS AND REYNOLDS COMPANY
800 Germantown Street
Dayton, OH 45407
(513) 226-0808

Edwin F. Strasser, President
Public corporation, OTC
Total employees: 2,699
Net sales, fiscal year end
9/30/76: \$94,873,138

THE COMPANY

- The Reynolds and Reynolds Company (R&R) was founded in 1866 in Dayton, Ohio. It has two separate businesses: manual business forms and electronic data processing services.
- From 1975 to 1976, company sales increased 15.1% from \$82.5 million to \$94.9 million. Net earnings during this period grew 30.4% from \$6.1 million to \$8.0 million. R&R forecasts a 15% sales and 20% - 25% profit increase between 1976 and 1977.
- The company had a before tax operating loss of \$600,000 attributed to R Ten (Reynolds terminal entry network) in FY 1975. This was a "build to order" system for wholesale distributors. R&R salesmen could not sell this service since they were used to selling the "standard" packages. This venture was sold to U.S. Steel in 1976.
- The company has developed a very strong relationship with its customer base. By offering products and services ranging from business forms to small business computers, R&R has established itself as the leading information company servicing the "big ticket" retail dealer. Its major competitors are CARS and ADP.

KEY PRODUCTS AND SERVICES

- Sixty-three percent of R&R's 1976 revenues were derived from designing, manufacturing, and marketing printed business forms. Revenues for this business have grown only 11% in the last five years, while profits have increased 17%.
- Both of R&R's businesses are oriented toward "big ticket" dealers. This includes automobile, truck, boat, farm and construction machinery, airplane, and motorcycle dealers. The company considers its potential market to include 30,000 automobile dealers; 15,000 of these are prospective customers. More than 50% of all EDP system sales are to auto dealers.

COMPANY HIGHLIGHT/REYNOLDS AND REYNOLDS COMPANY

- Thirty-seven percent of 1976 revenues were derived from electronic data processing services. These revenues have increased 17% over the last five years, while profits have grown only 9%. The remainder of this report will focus on the data processing services offered by R&R.
- R&R provides 45% batch processing, 45% remote computing (40% interactive and 5% remote batch), and 10% turnkey systems to retail distribution clients.
- The company's average revenues per product or services as of Sept. 30, 1976, are shown below:

PRODUCT OR SERVICE	AVG. REV.	# OF SYSTEMS	GROWTH RATE
Batch & Remote Batch	\$3800/yr/client	Batch-4900 Remote -750	0%
VIM II on-line	\$6900/yr/system		123%
VIM III			
Sales	\$75,000-100,000	32	
Leases	\$1300-2500/mo/system	32	

Information as of 9/30/76

- R&R has two turnkey systems: VIM II and VIM III, which provide automobile dealers with accounting, inventory, and payroll processing.
 - VIM II is a turnkey system based on Basic Timesharing, Inc. computer systems and Western Union EDT 300 and EDT 33 hard copy terminals. VIM II was developed in FY 1975 when R&R invested \$900,000 in VIM II and it generated revenues of \$4 million. FY 1976 VIM II revenues were \$11 million. In April 1977, there were 137 VIM II computers installed at 71 sites serving 120 cities and 2,150 customers.
 - VIM III, introduced in FY 1976, is for larger dealerships and permits all departments to be online simultaneously. Its software is compatible with that of VIM II. The 18 installed by 9/30/76 were generating \$675,000 revenues in sales and leases. By December 30, 1976, 32 VIM IIIs were installed.
- The company structures its marketing approach to its customers through all phases of automation. Users can start by accessing R&R's batch processing facilities and grow until they require an

COMPANY HIGHLIGHT/REYNOLDS AND REYNOLDS COMPANY

in-house small business computer also supplied by R&R -- VIM II or VIM III. R&R has 450 salesmen marketing its products on a "systems" service concept. Little or no program modifications are permitted.

APPLICATIONS

- Services offered by the company can be classified as general business services despite their orientation to a relatively narrow set of users.
- Services include general accounting, payroll, parts inventory control, and lease and service merchandising. New applications planned for 1977 include vehicle merchandising and repair order invoicing.

INDUSTRY MARKETS R&R revenues are essentially 100% derived from the retail distribution industry.

GEOGRAPHIC MARKETS

- Ninety percent of R & R revenues are from the continental U.S., the remainder being from Canada.
- The company has 125 sales offices fairly evenly distributed in principal cities throughout the U.S. Regional computer centers are located in Dayton, OH; North Hollywood, CA; Dallas-Ft. Worth, TX; Elmwood Park, NJ; Chicago, IL; and Brampton, Canada (Toronto).

COMPANY HIGHLIGHT

TYMSHARE, INC.
20705 Valley Green Drive
Cupertino, CA 95014
(408) 446-6000

Thomas J. O'Rourke,
President & Chairman
Public corporation, NYSE
Total employees: 1500
Total revenues, fiscal year
end 12/31/76: \$81,837,000

THE COMPANY

- Tymshare was founded in 1966 as an interactive remote computing services vendor specializing in scientific and engineering applications. It is now an international company providing a wide range of general purpose business and more specialized applications-oriented computer services. Services are offered to approximately 6,500 businesses in 40 different industry sectors and utilize a variety of delivery modes.
- In August 1976, Tymshare announced a reorganization of its marketing organization. The 400 person staff is now divided into three areas:
 - Information Services, providing remote computing services to the financial, accounting, petrochemical, and utility industries, and government agencies.
 - Industry Services, provides specialized remote computing and batch processing services to selected industries. Services include income tax, CATV, fuel oil dealer and distributor, medical, and travel agency processing.
 - Marketing Services, managing product planning, services and terminal marketing and support, training, and personnel development functions.
- The company's revenues grew from \$64.4 million in 1975 to \$81.8 million in 1976, a 27% increase. During the same time, net earnings grew 31% from \$5.1 million to \$6.7 million. At FY end 1976, earnings per share were \$1.55 with 4.2 million shares of common stock outstanding. Tymshare has a debt:equity ratio of 0.2:1.

COMPANY HIGHLIGHT/TYMSHARE, INC

- Tymshare is aggressively expanding its international services through a series of joint ventures, investments and acquisitions as shown below:

Affiliate	Country	Partner	Year Est.	Owner-ship	1976 Sales Volume*
CEGOS-TYMSHARE	France, Holland, Belgium, Switz.	Credit Lyonnais	1969	45%	\$5 M
Tymshare, U.K.	United Kingdom	Unilever	1974	66	1 M
Talorix-Tymshare	West Germany	Taylorix	1976	65	0
Kokusai-Tymsahre Ltd	Japan	Marubeni Corp	1976	45	0
SLIGOS S.A.	France	acquisition	1976	20	\$40 M

* INPUT Estimate

- Talorix-Tymshare is a recently formed joint venture scheduled to begin operations in 1977. It will increase the proportion of Tymshare's international to domestic revenues in future years.
- Tymshare purchased \$3 million worth of SLIGOS stock and convertible notes in 1976. If converted, they would give Tymshare a 20% interest in SLIGOS S.A. Credit Lyonnais is SLIGO's major shareholder.
- Kokusai-Tymshare Ltd services in Japan have been delayed pending Japanese government approval of Tymshare's telephone line service in Japan. In April 1976 the Japanese government announced liberalization of policy granting phone lines to foreign vendors but individual licenses have not yet been granted.

- In 1976, Tymshare completed acquisitions of:

- Medical Data Systems, a medical data processing company
- Unitax, Inc., a low-cost computerized tax processing vendor
- Western Twenty Nine, Inc., a vendor of remote computing services to the travel industry.
- Simplified Data Processing, Inc., an online Telefuel service vendor.

COMPANY HIGHLIGHT/TYMSHARE, INC.

- In 1977, Tymshare has acquired (subject to approval by WSBA member banks) the Western States Bankcard Association (WSBA) credit card processing operations. WSBA, an approximately \$20 million per year business, serves 270 banks with 6,000,000 Master Charge and VISA cardholders. Provided Tymshare can successfully defend this base, the acquisition will provide a large base for expansion of services to financial institutions and consumers.
- Tymshare's aggressive acquisition and diversification program, mature stable management, base of 5,600 customers, industry specialization, and excellent financial record make Tymshare a leading independent computer services vendor.
- In the third quarter of 1976, Tymshare offered its users a discount of approximately 40% on off-hours processing. The resulting unexpected switch by some customers to off-hours processing caused a temporary slowdown in revenues and profits growth. This has now been absorbed and historic growth has resumed.
- One out of three of Tymshare's 1500 employees works in sales, marketing, or marketing support, indicating the company's strong commitment to that function. Approximately 10% of the employees work in R&D.

KEY PRODUCTS AND SERVICES

- INPUT estimates that Tymshare's 1976 revenues were derived as follows:

- Processing services		83%
Remote computing	64	
Batch	19	
- Software products		2
- Professional Services (TASC)		1
- Terminal sales and rentals		5
- Maintenance and Refurbishment		5
- Tymnet		4
		<u>100%</u>

- Tymshare provides both batch and remote batch processing. Batch processing, expanded with the acquisition of United Data Centers, provided almost 20% of revenues in 1976.

COMPANY HIGHLIGHT/TYMSHARE, INC.

- Tymshare rents or sells terminals to its services customers. The terminals are purchased on a high volume OEM basis, providing Tymshare with a margin to market the terminals. Primarily offering teleprinter terminals on a rental basis, Tymshare has recently also begun to market intelligent and remote batch terminals.
- The company refurbishes used equipment through its Valcomp division.
- In December 1976, Tymnet, Inc., Tymshare's wholly owned subsidiary, became an FCC-licensed, value-added common carrier network. It can now be utilized not only for interconnection between Tymshare and its computer services customers, but also for connecting other customers' computer/terminal equipment and for message switching services. The company claims to offer more advanced features and cost advantages than Telex or TWX.

- Some of the industry and application specialized processing services provided by Tymshare are:

	<u>% of Total Rev.</u>
- Tax Returns	10
- Retail Fuel Oil Dealer Accounting	5
- Cable T.V. Accounting	1
- Medical Health Care	4
- General business and financial applications	9

- Tymshare has either developed or acquired advanced software tools, including:
 - Magnum, a relational data base management system introduced in 1975, is now a major revenue generator.
 - Express, a product of Management Decision Systems, Inc. distributed by Tymshare, provides specialized cross industry problem solving tools for market research and planning, particularly in the consumer products field.
 - FOCUS, an IBM 370 based high level information management system developed by Information Builders Inc. and introduced in 1976.
 - PERS, a new Personnel Evaluation and Reporting System
- The company is currently developing new specialized products for financial, manufacturing and production control, and marketing functions in medium and large organizations.

COMPANY HIGHLIGHT/TYMSHARE, INC.

APPLICATIONS

- INPUT estimates that Tymshare's 1976 processing services revenues were generated as shown below:

<u>Type of Service</u>	
General Business	15%
Specialty	30%
Scientific & Engineering	10%
Utility (including use of DBMS software: MAGNUM, EXPRESS, etc.)	<u>45%</u>
TOTAL	100%

INDUSTRY MARKETS

- Tymshare's more than 5600 users come from a variety of industries, including telephone, petroleum, banking and finance, insurance, medical, government, manufacturing, accounting, retail distribution, and other.
- The Federal Government generated less than 6% of total revenues in 1976. Management has indicated that efforts to expand penetration of this market are underway.

GEOGRAPHIC MARKETS

- Tymshare's principal marketing locations are:
 - Information Services: all major cities in the U.S. as well as Toronto, Canada.
 - Industry Services: most major metro areas plus 12 secondary cities.
 - International Affiliates: Brussels, London, Paris, Tokyo, The Hague, and Frankfurt.
 - Tymnet, Inc.: Cupertino, Houston, and Rockville (MD).

COMPUTER HARDWARE AND SOFTWARE

- Tymshare uses four IBM 370/158s, a variety of IBM models, 10 DECsystem 10s, 27 Xerox 940s, and 4 Burroughs computers.

COMPANY HIGHLIGHT

UNIVERSITY COMPUTING COMPANY
8303 Elmbrook
Dallas, TX 75247
(214) 688-7100

Sam Wyly, Chairman
F. L. (Mike) Harvey, President
U.S. Group
John Kason, President,
International Group
Wholly owned subsidiary of Wyly
Corporation
Total UCC employees: 1751
U.S. - 838; International - 913
Total UCC sales, fiscal year end
12/76: \$62,000,000

THE COMPANY

- University Computing Company (UCC) started providing computer services in 1963 with a used computer installed at Southern Methodist University in Dallas. The first year's revenues were \$693,000 with net profits of \$136,000. The company grew to \$57 million over the next four years with a net profit of \$5 million. Now it provides software, remote batch, and local batch services to over 4,000 customers throughout the United States and in 12 European countries.
- Wyly Corporation, UCC's parent, is currently attempting to recapitalize \$110 million of debt and exchange it for common stock and cash. It is uncertain as to the probable outcome of that recapitalization plan.
- The key strengths of UCC are the stability of its European profits, the technical competence of its people, the stability and market acceptance of its software products, the capability of its marketing force and the turnaround that has been achieved by the U.S. Group. All the divisions in the company were profitable for the full year 1976 period.
- Mike Harvey, at the helm of UCC's U.S. group for 18 months has improved the profitability and stability of the company. He has done this by:
 - Pruning unprofitable products and contracts.
 - Reorganizing the Divisions' managements.
 - Increasing emphasis on marketing and planning; leveraging profitable products.
 - Developing a better employee climate by emphasizing personnel development and training as well as compensation and promotion.

COMPANY HIGHLIGHT/UNIVERSITY COMPUTING COMPANY

KEY PRODUCTS AND SERVICES

- Revenues for fiscal 1976 were \$62 million, segmented as follows:

U.S. Group		\$32 million
Banking Division	12 million	
Scientific and Engineering Division (SED)	13 million	
Commercial Division	7 million	
International Group		<u>\$30 million</u>
		\$62 million

- The Banking Division was established as a result of the 1972 acquisition of Results, Inc. Its major strengths are its central information file (CIF), financial control system (FCS), magnetic ink character recognition system (MICR), commercial loan system (CLS), and instalment loan system (ILS) software.

The Banking Division was slated to be sold during late 1975 and early 1976. After negotiating with several buyers, UCC decided to keep the division and turn it around. However, uncertainty during the negotiations hurt morale and increased personnel turnover. These problems seem to have been overcome as the Division was profitable in each of the last seven months of 1976. The trend has continued in 1977.

- The Scientific and Engineering Division, the oldest group in the company, was only marginally profitable through 1976. Its services were not sold aggressively.
 - UCC has now strengthened marketing, improved turnaround capability, and increased the number of application programs available on its large Univac and CDC mainframes.
 - Through selective repricing and a strengthened sales force, the division significantly improved its revenues and profit margins entering into 1977.
 - Recent division strategy has been to shift emphasis from the sale of raw machine time to application services; it will focus on problem solving services instead of pure hardware. This emphasis on applications has higher potential profit margins than raw time sales. In addition, its value-added aspect reduces the impact of price competition which typifies the bulk of the utility applications market.

COMPANY HIGHLIGHT/UNIVERSITY COMPUTING COMPANY

- The Commercial Division, the fastest growing group within the company, has been profitable since its inception, has leveraged UCC's technical capabilities, has developed internally, and has acquired software packages oriented either to increasing the efficiency of IBM computer centers or providing financial control. The Division's packages are in use in more than 1000 customer accounts in the U.S., Canada, and Central America.
- The International Group has consistently been the most profitable and one of the fastest growing groups in the company. It has the potential to continue growing at over 20% per year over the next three years. It has also been the most stable portion of UCC. Under the leadership of John Kason, top management has been retained for over 10 years.

APPLICATIONS Scientific and engineering, and utility processing generate approximately 70% of UCC U.S. revenues as shown below:

<u>Type of Service</u>	<u>% of Total Revenues</u>
Scientific & Engineering	40
Utility	30
Specialty	25
General Business	5

INDUSTRY MARKETS

- The proprietary software accumulated by UCC gives it unique capabilities in its selected industry and application markets--namely: banking, financial, petroleum, nuclear, and construction industries, and all medium and large IBM OS installations wishing to improve productivity.
- UCC International provides processing services to a similar set of industry markets as the U.S. Group: scientific and engineering, banking and finance, and commercial.
 - However, these services are generally based on a different set of products with particular exceptions in the scientific and engineering remote batch markets.
 - The major markets addressed by SED are civil-structural, electronic, nuclear, and petroleum-petrochemical engineering; manufacturing; and general mathematical and engineering analyses.

GEOGRAPHIC MARKETS

- UCC's software products are currently being used at sites in 14 countries from Finland to Iran. Almost 50 European installations use UCC TWO to ease their conversion from DOS to OS. Some of the largest companies in Europe are customers.
- Despite a relatively small Banking sales force, UCC has managed to sell to every major bank in Boston, Phoenix, Cleveland, and Birmingham. Other cities, such as New Orleans, have been more difficult to penetrate because of the apparent conservatism of their bankers. UCC claims that sixty-seven percent of the largest 150 banks in the U.S. use at least one of its banking software products.

COMPUTER HARDWARE AND SOFTWARE UCC has consolidated its scientific computation capabilities in one "supercenter" in Dallas. The Data Center has five Univac 1108s and two CDC 6600s. An IBM 370/148 is currently being installed. UCC has upgraded its software and improved its network continually since the early 1960s. It is now reported to have one of the most reliable networks in the United States.

B. SUBSIDIARIES OR DIVISIONS
OF LARGE COMPANIES

COMPANY HIGHLIGHT

CONTROL DATA CORPORATION
8100 34th Avenue South
Minneapolis, MN 55420
(612) 853-8100

William C. Norris, Chairman and
Chief Executive Officer
Public corporation, NYSE
Total employees: 41,000+
Total revenues, fiscal year end
12/31/76: \$2,009 million*
Computer Business Revenues: \$1.358
million

THE COMPANY

- Total company revenues grew from \$1.929 million in 1975 to \$2,009 million in 1976, a growth of 4%. The aggregate computer business grew 9% while financial services revenues declined 3.6% during the 1975/1976 timeframe
- Total corporate net earnings grew 28.9% between 1975 and 1976, from \$37.7 million to \$48.6 million. Commercial Credit's earnings in 1976 were \$36 million. The computer business, which had a steeper earnings growth rate (35.4%) from a smaller base, rose from \$9.3 million to \$12.5 million between 1975 and 1976.
- Earnings per share, including extraordinary items, were \$2.80 with 16.7 million shares outstanding.

KEY PRODUCTS AND SERVICES

- The company is divided into three operating entities: computer operations, financial services, and education.
 - The computer operations group, headed by Robert M. Price encompasses computer systems, services, and peripherals.
 - The financial services group, headed by Paul G. Miller, encompasses the business of Commercial Credit Company.
 - The newly formed education company, headed by John W. Lacey, includes schools, learning centers and computer-aided education
- The education group offers:

* Includes Commercial Credit

COMPANY HIGHLIGHT/CONTROL DATA CORPORATION

- Fourteen Control Data Institute schools.
- Thirty learning centers in major U.S cities equipped with PLATO, a computer-based instructional system.
- Computer systems, software, and terminals to implement computer-aided education.
- CDC's computer services revenues, derived from the computer group, were \$500 million in 1976, up 20% from 1975. This business is segmented into professional, engineering, data, and dedicated industry services.
 - Professional services with more than 2,000 employees, accounted for approximately \$45 million in 1976. Services include programming, design, and consulting work in areas such as structural and nuclear engineering.
 - Engineering services with more than 6,000 employees, generated \$175 million in 1976 from providing worldwide computer maintenance for products of both CDC and other manufacturers.
 - Data services encompasses the computer services offered on CDC's Cybernet network as well as the applications offered on Service Bureau Company's CALL/370 network. These services have been integrated into a single network encompassing 180 local markets and using 21 large mainframe computers located in five major computer centers in the U.S. Other service centers are located in Canada, Australia, Mexico, Israel, Brazil, South Africa, and six European countries.
 - Dedicated industry services offered include:
 - . ARBITRON, an audience rating service which grew 23% in 1976.
 - . TICKETRON, a ticketing and wagering service which grew 30%.
 - . BTSI, which provides services to the brokerage community.
 - . ACTION, which provides data services oriented to financial companies.
 - . TELEMONY, a electronic funds transfer service for the banking community.
 - . FOCUS and SRI, which are oriented to credit unions and medical information services, respectively.
- New products recently announced in the computer services area are:

COMPANY HIGHLIGHT/CONTROL DATA CORPORATION

- UNISTRUC, a service integrating structural analysis techniques and computer graphics. Management expects this service to improve user productivity by as much as 75%.
- CDC's CALL/370 interactive-service introduced new manufacturing applications in the materials requirement and planning area as well as a new credit application to help bank loan officers evaluate a company's ability to repay a loan.
- CDC management is strongly committed to the computer services market. Its recent organizational restructuring will help the company to improve the focus of its resources and accomplish its growth and profit objectives.

APPLICATIONS CDC's major applications are general business and scientific and engineering. It also provides services for specialty and utility application.

INDUSTRY MARKETS Financial, process manufacturing (petroleum), engineering, and government are CDC's major industry sectors although it derives revenues from most industries except transportation.

GEOGRAPHIC MARKETS CDC offers services throughout the U.S. and in Canada, Australia, Mexico, Israel, South America, South Africa, Western Europe, and Japan.

COMPUTER HARDWARE AND SOFTWARE CDC's 21 large mainframes include Cyber 170s, Cyber 76s, and various IBM mainframes as well as a variety of other computers and peripheral equipment.

COMPANY HIGHLIGHT

GENERAL ELECTRIC INFORMATION
SERVICES BUSINESS DIVISION
401 North Washington Street
Rockville, MD 20850
(301) 340-4000

Donald S. Bates, General Manager
Division of General Electric Co.
Total employees: 2400*
Total revenues, fiscal year end
12/31/76: \$120,000,000*

THE COMPANY

- General Electric was the first company to offer interactive processing as a commercial service. Begun in 1965, the services started in New York and Phoenix on a local basis. Within two years, it had expanded to 17 cities. The network evolved from users with multi-city locations demanding that data communications be added to the problem-solving capability of the system. The General Electric Information Services Business Division (GEISBD) now offers interactive processing and remote facilities management services to more than 5,000 customers via its 100,000 mile network.
- INPUT estimates total 1976 retail revenues for GEISBD to be \$120 million, up from \$100 million in 1975.
 - Approximately \$20 million of the 1976 revenues are derived from overseas where GEISBD authorized distributors market its services. This \$20 million represents an estimated 45% of the total overseas commercial revenues. The other 55% of overseas revenues are paid to authorized distributors to cover sales and support costs.
 - Honeywell is the largest of GEISBD's marketing agents and covers most of Europe. GEISBD services in Japan are distributed through a joint venture known as GE-Dentsu.
- Because GE has limited itself to internal growth, it has developed more slowly than those companies in the industry which have utilized acquisition as an expansion mode. This has limited GE's entry into new markets.
- GEISBD's major strengths are its: large size; extensive network; GE name; concentration of equipment in Brook Park, Rockville, and Amsterdam; growth potential; GE's resources; and presence in 21 countries in Europe, Australia, Canada and Japan.

* Estimate by INPUT

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- Eighty percent of the Division's revenues are produced by 20% of the clients, making its service potentially vulnerable to business losses. Mitigating this danger is the fact that no single client generates more than 2% of revenues.

KEY PRODUCTS AND SERVICES

- Processing services generate 95% of GEISBD revenues, remote facilities management (FM) 3%, and professional services 2%. Professional services are available only to existing clients in support of or as an enhancement to processing.
- GEISBD has a full line of problem-solving software on its network, MARK III. Its proprietary operating system supports a variety of languages:
 - BASIC
 - Two versions of interactive FORTRAN: FORTRAN IV and FORTRAN 77, the newest interactive FORTRAN, which was announced in March and conforms to current as well as proposed future standards. GEISBD claims it to be up to 20% more efficient than FORTRAN IV.
 - One version of COBOL. This, in addition to FORTRAN IV are optimized for background processing.
 - ALGOL is supported overseas.
 - JOVIAL is available but not supported by GEISBD.
- GEISBD also offers:
 - FAL II, a financial analysis language
 - DMS, a database manager
 - DMS II, an extended version of DMS, capable of interacting in French and German as well as English
 - StatSystem, a statistical analysis package
 - OMNI, order service program generator
 - TIPS, telephone information processing service, a voice answerback service
 - MAP, an econometric data base service
 - Currency Data Base Service used for financial reporting
 - Securities Data Base Service used by the financial community
 - Cash Management System used by corporate controllers

COMPANY HIGHLIGHT/GENERAL ELECTRIC INFORMATION SERVICES BUSINESS DIVISION

- In addition to these GEISBD supported programs, the Division offers network software services (NSS) which are used by authors to market their software.
- GEISBD has targeted large rather than entry level clients. This makes the Division particularly vulnerable to the impact of new technologies as its users may have the capability to implement new or leading edge technologies before GEISBD.
- To reduce its vulnerability and strengthen its customer ties, GEISBD has a Custom Application Operation (CAO) with more than 125 professionals in the U.S. to develop software for custom turnkey applications utilizing many of GEISBD's software development tools.
 - These contracts focus on the development of large, complex production-type applications.
 - For example, OMNI, an order service program generator used by CAO, enabled GEISBD to implement a custom order entry service in less than one month; up to five months less time than normal.

APPLICATIONS

- More than 400 applications programs are available over the MARK III network, including order processing, personnel management, payroll, accounting, numeric control, statistics, modeling, engineering, nuclear power, industrial education, financial, and medical. In addition, many oil company products are piggy-backed over GEISBD's network.
- More than 150 of MARK III's 1,000 overseas customers use the network for international applications.

INDUSTRY MARKETS

- GEISBD focuses its marketing efforts on large companies and financial institutions which can benefit most from its international network. In addition it targets selected industries for which it has either developed or acquired software packages. These industries are:

Electric and telephone utilities
Petroleum
Services (CPA firms principally)
Banking
Federal Government

- The Division also offers primarily general business services to most other industries and provides processing for the Hospital Corporation of America hospitals.

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GEOGRAPHIC MARKETS: GEISBD has a 100,000 mile network covering the North America, as well as more than 100 cities in Australia, Canada, Europe, and Japan.

COMPUTER HARDWARE AND SOFTWARE

- GEISBD has more than 100 Computers in Ohio, Maryland, and Holland. The centers include Honeywell HIS 6080 and IBM 370/158 mainframes. The network is composed of high-speed telephone and satellite links in North America and undersea cables to Europe, Australia, and Japan.
- MARK III network will support CPU to CPU hookups; any ASCII, EDCDIC, or correspondence code terminal; and touch tone telephones. Its Telephone Information Processing (TIP) system is a 300,000 word audio response system for use with 12-key touch tone telephones.

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COMPANY HIGHLIGHT

INFORMATICS INC
21031 Ventura Boulevard
Woodland Hills, California 91364
(213) 887-9040

Dr. Walter F. Bauer, President
Subsidiary of the Equitable Life
Assurance Society of the
United States
Total employees: 2200
Revenues for fiscal year ending
12/31/76: \$59,300,000

THE COMPANY

- Informatics, Inc. was organized in Los Angeles in 1962, to provide custom software development and contract programming to the government marketplace. Its first standard software product, MARK IV, was offered in 1967. It went public in 1969. In early 1974, the company became a subsidiary of The Equitable Life Assurance Society of the United States, the nation's third largest life insurance company.
 - Informatics now provides software products, data services, contract programming, technical, and consulting services to both the commercial and government markets.
 - The company is one of the world's largest independent software products vendors. Its more than a dozen packages have 2,800 installations in 43 countries. Revenues from these software products exceeded \$21,000,000 in 1976. Informatics' top selling product, MARK IV, is one of the most successful software products ever marketed.
- The company's revenues increased 50% between 1975 and 1976 from \$39.4 million to \$59.3 million. Commercial sales increased from 68% to 74% of total revenues while parent-generated revenues declined from 11% to 7% of the total for the same period. Federal Government revenues, while increasing in dollars, have declined as a percentage of total revenues from 53% in 1971 to 26% in 1976. Informatics is continuing its three year policy of reinvesting profits into new product development.
- Informatics has historically placed heavy emphasis on growth. Revenues nearly tripled between 1972 and 1977 from \$22.1 million to \$59.3 million. Two of the company's recent major acquisitions were Programming Methods, Inc. (PMI) in 1975, a software products and professional services company which added \$13 million in new annual revenues; and Management Horizons Data Systems, Inc. (MHDS) in 1977, a data processing facility supplying management consulting and business data processing services to the distribution industry. MHDS annual sales total approximately \$7.8 million.

COMPANY HIGHLIGHT/INFORMATICS INC.

- Although growth is expected to continue, management is now spending more time on internal organization and efficiency. The company's general business mix during the next couple of years is expected to remain unchanged.

KEY PRODUCTS AND SERVICES

- Informatics products and services generate fairly even revenues, as shown below:

<u>Category</u>	<u>1976 Revenue</u>	<u>% of Total</u>	<u>% Incr. over '75</u>
Professional Services	\$22.4 m	38%	65%
Software Products	21.1 m	35	46
Data Services	<u>15.8 m</u>	<u>27</u>	40
TOTAL	\$59.3 m	100%	

- The company's professional services staff provides systems development, contract programming, systems evaluation and consulting services for general business and scientific and engineering applications.
- Informatics software products have an installed base of more than \$100 million in 1977. Representative products include:
 - MARX IV: a systems software product tool providing data management, file management, and on-line systems development to design, develop, and operate batch and on-line data processing systems. With more than 1100 installations in the U.S. and 42 foreign countries, Mark IV has generated revenues in excess of \$56 M. The sales of MARK IV increased 32% in 1976 over 1975 worldwide and more than 200% outside the U.S. and Canada.
 - The MONITOR IV products, INTERCOMM, BETACOMM, and MINICOMM are customized teleprocessing monitors which interface between IBM 360/370 operating systems and user applications programs. Currently installed at a total of 285 sites, the MONITOR IV products were acquired with Programming Methods Inc.
 - Other software products such as LIFE-COMM III (a life insurance home office administration system), ACCOUNTING IV, PRODUCTION IV, Corporate Shareholder System, ISSUE-COMM, Stock & Bond, Mortgage Loan, SCORE, SHRINK, CL*IV, MARK IV/EEO, MARK IV/Auditor, MARK IV/Reporter, BIBPRO IV, and RECON IV/STIMS IV.
 - LIFE-COMM III, being installed at 30 insurance companies, is marketed under the Equimatics name.

COMPANY HIGHLIGHT/INFORMATICS INC.

- Data services are interactive and remote computing services, including data collection and analysis, and photocomposition. Specific services include access to medical data bases and litigation information systems.

APPLICATIONS: Informatics offers software products for accounting, financial, life insurance, and manufacturing management. Contract services provide general business and scientific and engineering applications.

INDUSTRY MARKETS:

- Informatics' Equimatics Division, located in Dallas, Texas, specializes in software products, data services, and consulting for the insurance industry.
- Government revenues from contract programming and technical services comprised 26% of Informatics sales in 1976 and encompassed 500 Informatics employees. This included contract programming employees at the Ames Research Center and at the Jet Propulsion Laboratory in addition to technical personnel performing library, abstracting, classifying, and publication services at other government sites.
- The company's software products and data services are marketed to a wide range of industries: medical/hospital, law, insurance, and government, in addition to a variety of commercial installations.

GEOGRAPHIC MARKETS:

- Informatics clients are located worldwide. The company maintains 44 offices in the U.S. and 6 outside the country. In addition to Corporate and International Marketing facilities at Woodland Hills, operating unit headquarters are located at River Edge, N.J.; Dallas, Texas; Rockville, Maryland; and Canoga Park, California.
- Total revenues are derived from the following U.S. regions:

Northeast	60%
Pacific States	
(including Hawaii and Alaska)	14%
South Central	8%
North Central	8%
Midwest	3%
Mountain	1%
New England	3%
Southeast	3%

COMPANY HIGHLIGHT/INFORMATICS INC.

COMPUTER HARDWARE AND SOFTWARE: Informatics has two IBM 370/158 computers, located in Fairfield, N.J. and two IBM 370/168's located in Columbus, Ohio which form the heart of its nationwide data services network. In addition, smaller computers are used at various other locations for product development, maintenance, and local data services.

COMPANY HIGHLIGHT

THE INSCO SYSTEMS CORPORATION
3501 State Highway No. 66
Neptune, NJ 07753
(201) 922-1100

Francis B. Wadelton, President
An affiliate of The Continental
Corporation
Total employees: 1200
Total sales, fiscal year end
12/31/76: \$31,300,000

THE COMPANY

- The INSCO Systems Corporation, an almost totally captive processing company, was founded in 1968. It offers batch and utility processing and professional services.
- INSCO's 1976 revenues represented an increase of 7% over 1975 revenues of \$29.2 million.

KEY PRODUCTS AND SERVICES

- In 1976, batch and utility processing generated two-thirds of total company revenues. The remainder was from professional services: contract programming, education, and consulting.
 - More than 80% of INSCO's processing and software business is derived from its parent corporation, a \$6.1 billion financial services organization.
 - External revenues are derived primarily from specialty insurance services to external users.
- INSCO is taking a conservative approach to the commercial computer services market by developing and testing products on a regional basis before introducing them nationwide.
- Specific insurance products include policy writing, personnel management, agency billing and accounting, claims accounting, statistical worker compensation, and managing general agent services.
- Cross industry business products include administrative, data base management, project management, statistical analysis and simulation, manufacturing management, and portfolio analysis systems.

COMPANY HIGHLIGHT/THE INSCO SYSTEMS CORPORATION

- Educational services are oriented to either training client personnel in computer usage or implementing/enhancing client in-house educational facilities for training computer programmers. INSCO's Programmer Knowledge Survey is utilized by a large number of firms in testing the skills of current or prospective employees.

APPLICATIONS INSCO only offers industry-specialized services for insurance and manufacturing companies. The general business applications are tailored to meet the needs of these industries.

INDUSTRY MARKETS More than 95% of INSCO's 1976 revenues were derived from the insurance industry. Remaining revenues were from discrete manufacturers.

GEOGRAPHIC MARKETS

- While users are located throughout the U.S. and Canada, they are highly concentrated in the Northeast, which accounts for 80% of INSCO sales. Other revenue producers are the North Central and Southeast regions, and Canada. Branch offices are located in: Atlanta, Chicago, Columbus, Dallas, Glen Falls (NY), New York, San Francisco, and Toronto.
- Agents for selling utility processing are located in the following 29 states:

Alabama	Maine	Pennsylvania
Arizona	Maryland	South Carolina
Arkansas	Massachusetts	Tennessee
California	Minnesota	Texas
Connecticut	Nebraska	Vermont
Florida	New Hampshire	Virginia
Georgia	New Jersey	Washington
Indiana	New York	West Virginia
Kentucky	North Dakota	Wisconsin
Louisiana	Ohio	

COMPUTER HARDWARE AND SOFTWARE

- INSCO facilities consist of large interconnected IBM systems with the following mainframes:
 - 1 IBM 370/168 Neptune, New Jersey
 - 2 IBM 370/158s Neptune, New Jersey
 - 1 IBM 360/67 Neptune, New Jersey
 - 1 IBM 370/115 New York, New York
 - 2 IBM 360/50s Chicago, Illinois
 - 4 IBM 360/30s Columbus, Ohio
Glen Falls, NY
San Francisco, CA
Toronto, Ontario

- All computers are linked to Neptune via a private line and WATS network with Sycor modems.

COMPANY HIGHLIGHT

MARTIN MARIETTA DATA SYSTEMS
300 East Joppa Road
Baltimore, MD 21204
(301) 321-5700

Barry D. Rowe, President
Division of Martin Marietta Corp
Total employees: 1200
Computer Services sales, fiscal
year end 12/31/76: \$45,000,000

THE COMPANY

- Martin Marietta Data Systems (MMDS) was formed in 1970 by Martin Marietta Corporation to sell data processing and resource management services to the manufacturing industry.
 - In 1973, MMDS formed a joint venture with Financial Industry Systems (a subsidiary of the Hartford National Bank and Trust Co) to extend these services to banks, insurance companies, and the financial industry.
 - In 1975, the parent corporation acquired Hoskyns Group Ltd., an English computer software firm, to add expertise to MMDS.
 - MMDS currently offers remote batch processing as well as professional services and software products. Local batch processing is also available.
- MMDS revenues have grown 5% since 1975 from \$43 million to \$45 million. In the same period, its parent had revenue increases of 16%, from \$1.066 billion to \$1.232 billion; net earnings grew 42%, from \$55.367 million to \$78.503 million.
- The 1200 employees are divided as follows:
 - computer services 700
 - operations 300
 - marketing 75
 - administration 75
 - other 50
 - 1200

KEY PRODUCTS AND SERVICES

- Fifty-five percent of MMDS's annual revenues are derived from worldwide commercial sales. The remaining 45% are generated by its parent corporation and divisions.

COMPANY HIGHLIGHT/MARTIN MARIETTA DATA SYSTEMS

- Of the U.S. commercial sales, nearly 40% are derived from remote computing services, 35% from facilities management, and 25% from software products and professional services.
- MAS (Modular Applications Systems) with over 600 systems installed is MMDS's major software product. Designed for in-house use on IBM systems it is also made available free of charge to users of MMDS remote computing services and network. MAS consists of six main business oriented systems, 110 jobs (system modules), 225 programs, and 4250 submodules.
- Professional services, generating approximately 12% of MMDS U.S. revenues, provide custom systems development as well as turnkey installations. MMDS employs a proprietary system architecture when designing and implementing minicomputer-based systems. It also utilizes SDM. The majority of MMDS contract programming is applications oriented
- SDM (Systems Development Methodology), a noncomputerized management tool, is a methodology for managing projects and developing systems. It is the standard which MMDS uses for controlling turnkey projects and implementing MAS based systems, and is also available as a proprietary product. It currently has approximately 40 installations.

APPLICATIONS MMDS provides primarily general business applications. Those available through MAS include:

- Financial control
 - General accounting
 - Financial accounting
 - Inventory accounting
 - Plant accounting
 - Payroll
- Inventory control
 - Material requirements planning
 - Inventory management
 - Inventory recording
- Business planning
 - Resource planning
 - Forecasting
 - Budgeting
- Manufacturing control
 - Production scheduling
 - Production expediting
 - Performance reporting
- Cost control
 - Job batch costing
 - Standard costing
 - Standard cost generation
- Order control
 - Customer order processing
 - Invoicing
 - Purchase order processing
- Foundry control
- Engineering design and control

COMPANY HIGHLIGHT/MARTIN MARIETTA DATA SYSTEMS

INDUSTRY MARKETS Discrete manufacturers provide more than three-fourths of MMDS commercial revenues, followed by the financial industry, wholesale distributors, services firms, and federal, state and local government agencies. Its parent company, a manufacturer of aluminum, chemicals, cement, and aerospace products is the largest single customer, accounting for 45% of worldwide sales.

GEOGRAPHIC MARKETS:

- Approximately 50% of MMDS annual revenues are derived from the central midwestern U.S. Remaining revenues are unevenly distributed throughout the U.S. with a concentration in the Western and Pacific states. International sales, principally European, generate approximately 17% of total revenues.
- Sales and branch offices are located in Towson, MD; Orlando, FL; Rocky River, OH; Englewood, CO; Philadelphia, PA; Torrance, CA; Des Plaines, IL; New York, NY; and London, England.

COMPUTER HARDWARE AND SOFTWARE

- MMDS uses the following hardware in providing its services:

2	IBM 370/168s	MVS/JES2
2	IBM 370/158s	MVS/JES2
1	IBM 370/148	VSI
1	IBM 370/135	OS/MFT, HASP
1	CDC 6500	SCOPE
- Available software includes IMS, CIS, DBOMP, TSO, and MMDS products such as MAS. Languages include COBOL, FORTRAN, PL/1, SNOBOL, RPG, and Assembler.
- MMDS continuously evaluates IBM and other vendor state of the art hardware and software for implementation in its system.

COMPANY HIGHLIGHT

MCDONNELL DOUGLAS AUTOMATION CO.
Box 516
St. Louis, MO 63166
(314) 232-0232

W. R. Orthwein Jr., President
Division of McDonnell Douglas Corp.
Total employees: 4,000 approximately
Total company sales, fiscal year
end 12/31/76: \$190.2 million

THE COMPANY

- McDonnell Douglas Automation (MCAUTO[®]), established in 1960, provides data entry, data processing, facilities management, consulting, systems analysis and design, and programming and training services.
- Total company revenues increased from \$163.5 million in 1975 to \$190.2 million in 1976, a 16% growth. The commercial business of the company increased 38% during the same period, from \$55.5 million to \$76.8 million. First six months of 1977 commercial sales were \$52.022 million, indicating that this growth will probably be maintained in 1977.
- MCAUTO has an excellent reputation among engineering and architectural firms for providing complex design and project management tools utilizing proprietary structural design and online interactive graphics systems.

KEY PRODUCTS AND SERVICES

- Eighty-five percent of the revenues are derived from processing services - approximately two thirds from batch, and remote batch - the rest from interactive and inquiry services as well as from professional services, software products and turnkey systems.
- Almost 50% of MCAUTO's employees are located in St. Louis and 27% are on the West Coast. Of the total work force of almost 4,000 (1Q77), 24% are classified as programmers, 6% as consultants, 21% marketing, 10% administrative, and others in operations.
- The Hospital Services Division has been one of the fastest growing groups since its acquisition in April 1970. Although the growth-rate of new hospitals has slowed, MCAUTO is now offering additional online services to increase its revenues per hospital bed. To combat the potential threat of minicomputers, the company offers a DEC

COMPANY HIGHLIGHT/MCDONNELL DOUGLAS AUTOMATION COMPANY

minicomputer system as part of the services offered. The hospital group's revenues increased 52% in 1976 over 1975.

- Manufacturing and numerical control services are another area of specialization for MCAUTO. In addition to computer-aided design and the computer-aided manufacturing (CAD/CAM) systems utilizing several IBM mainframes and alphanumeric and graphic CRT terminals, MCAUTO offers turnkey numeric control (UNIAPT) and interactive graphics (UNIGRAPHICS) systems through its United Computing Corporation subsidiary in Carson, CA.
- In addition to the above systems, MCAUTO provides an integrated manufacturing system, a proprietary system for Bell Companies, an integrated financial system, and online data collection services.

APPLICATIONS Approximately 50% of MCAUTO revenues are derived from applications for the medical/hospital industry. The remaining revenues are from general business, scientific and engineering, utility, and other applications.

INDUSTRY MARKETS Approximately half of MCAUTO revenues are derived from the medical industry, while the remaining 50% are derived from the services industry, manufacturing/distribution, utilities, insurance, education.

GEOGRAPHIC MARKETS More than three fourths of MCAUTO revenues are derived from the Central and Eastern states; the Pacific Coast region and international sales provide the remainder.

COMPUTER HARDWARE AND SOFTWARE

- MCAUTO Operates 99 mainframes in six computer centers located in Denver, CO; Huntington Beach and Long Beach, CA; Peoria, IL; and two in St. Louis, MO.
- As of the first quarter of 1977, 5070 terminals were online to these computer centers. Forty-three percent of these terminals were used in general business applications, 24% in hospital services, and 33% inside McDonnell Douglas Corporation.
- The computer center equipment includes IBM 370/168 and CDC 6600 mainframes. MCAUTO is currently evaluating the latest generation IBM equipment.

COMPANY HIGHLIGHT

PLANNING RESEARCH CORPORATION
Suite 502
1025 Connecticut Ave NW
Washington D.C. 20036
(202) 293-4700

Harrison A. Price, Chairman
Jack D. Little, President
Public corporation, NYSE
Total Employees: 6,948
Total revenues, fiscal year
end 6/30/76: \$148,012,000
FYE 6/30/77: \$185,557,000

THE COMPANY

- Planning Research Corporation (PRC) has two basic business components: Planning, Engineering, and Architecture; and Information and Management Sciences. With capabilities in over 100 disciplines, PRC considers itself the world's largest diversified professional services organization specializing in serving government, business, and industry.
- Total PRC revenues grew from \$135.3 million to \$148.0 million between 1975 and 1976, an increase of 9.3%. Earnings during this time grew less than 1%. In fiscal year 1977, both revenues and earnings are expected to grow 20%. Earnings for the third quarter fiscal year 1977 were \$921,000, a 19% increase over third quarter 1976.
- Between 1976 and 1977, the Planning, Engineering, and Architecture groups revenues are expected to grow from \$62.7 million to nearly \$100 million. The Information and Management Sciences group revenues are expected to grow from \$60.6 million to approximately \$85 million in the same period.
- PRC recently announced a major reorganization. Effective September 1, 1977, it will be implemented over a several month period. The essential elements of the reorganization are:
 - Corporate offices have moved from Los Angeles to Washington, D.C. as the majority of PRC and subsidiary revenues are derived from the Chicago, New York, Washington, D.C. areas.
 - William K. Hodson, President and Chairman for the past four and one-half years, resigned rather than relocate. He will continue as a consultant to the Board of Directors, according to PRC.
 - Harrison A. Price, formerly Senior Vice President of Corporate Marketing, was named Chairman.
 - Jack D. Little, formerly Vice President and Group Manager of PRC Information and Management Sciences Company, was named President.
 - Jerome M. Fischer and John M. Toups were named Executive Vice Presidents of Planning, Engineering, and Architecture and Information and Management Sciences respectively. David P. Barnhill was named Senior Vice President of Finance and Administration.

COMPANY HIGHLIGHT/PLANNING RESEARCH CORPORATION

- The company has a healthy financial posture, a record of growth and accomplishment for the past 4 years, and compound annual growths exceeding 25% for the last ten years. These positive factors give PRC an excellent opportunity to continue growth rates similar to, or better than, those in the past.
- Its weakest areas are in corporate marketing to new markets and lack of unified, well established corporate image. To strengthen these weaknesses, PRC recently created a new centralized corporate marketing group. Although corporate management believes that PRC and its subsidiaries are best suited to a "federally decentralized" form of organization, a greater emphasis will be placed on the corporate name. This is expected to strengthen PRC's corporate image and will be the focus of an advertising campaign planned for Fall 1977.
 - PRC Information Sciences has a strong marketing force in existing markets.

KEY PRODUCTS AND SERVICES

- Typical projects for the Planning, Engineering, and Architecture group have included automating traffic signal systems, water pollution control facilities design, airport and community plans, and irrigation design projects.
- Computer services are offered through the Information and Management Sciences group.
 - Its revenues are segmented as follows:

Professional Services	65%
Facilities Management	15%
Turnkey Systems	10%
Processing Services	10%
 - Its areas of greatest growth are turnkey systems, real estate, tax assessment, health services, facilities management contracts for state and local government, and command and control systems for DOD agencies.

COMPANY HIGHLIGHT/PLANNING RESEARCH CORPORATION

- The Information and Management Sciences group, really a collection of subsidiaries and affiliates, consists of the following companies:

<u>COMPANY NAME</u>	<u>NO. OF EMPLOYEES</u>
Data Services	1000
Information Sciences	540
Logica (Affiliate)	500
Technical Applications	270
Computer Center	250
Maynard	200
Realtronics Computer Systems	100
Public Management Systems	75
Jacobs	40

- Services provided by each company are:
 - Data Services Co. provides professional services and facilities management. Its major FM contract is with the National Aeronautics and Space Administration headquarters. This is PRC's low overhead government support contracts division.
 - Information Sciences Co. provides the largest portion of revenues. It offers professional services, medical claims processing, and micrographic services, primarily for federal government agencies. Contracts include a CHAMPUS contract for claims processing with the federal government and micrographic contracts with the Air Force and Navy Bureau of Personnel.
 - Logica Ltd. provides consulting in many areas of the computer services industry, including communications, banking systems, and systems software. It also markets a word processing system.
 - Technical Applications provides parts provisioning, safety engineering, and training services. Primary user is the Department of Defense.
 - PRC Computer Center, Inc. provides local batch processing services. It also offers some remote computing and some processing support for facilities management contracts.
 - Maynard, Inc. offers management consulting services. It has studied productivity, product management, operations, organization, and maintenance.
 - Realtronics provides a real estate multiple listing service. It offers a turnkey system based on a Hewlett Packard minicomputer and Texas Instruments terminals. To date, 21 systems have been installed. Users include four of the top five multiple listing real estate companies.

COMPANY HIGHLIGHT/PLANNING RESEARCH CORPORATION

- Public Management Systems specializes in the development of automated criminal justice systems for state and local governments. It is currently under contract to develop a system for New Zealand. Past contracts have included development of fire department command and control systems, police information and training systems, and court systems.
- Jacobs, Inc. offers data processing and management consulting services to city tax assessors. Jacobs has developed a model for computer assisted evaluation and data base management of tax assessment files. Typical contracts have been with the cities of Erie, New York and West Hartford, Connecticut.

INDUSTRY MARKETS The federal government continues to be a major user of services provided by the Information and Management Sciences group, as shown below:

Federal Government	60%
International (mostly commercial contracts)	20%
State & Local Government	10%
Misc. Industry Sectors	10%

GEOGRAPHIC MARKETS PRC and its affiliates and subsidiaries service clients throughout the U.S. and the world. PRC currently maintains some 200 offices in 54 countries in addition to regional headquarters in Los Angeles, McLean, and London.

COMPUTER HARDWARE AND SOFTWARE PRC's subsidiary, PRC Computer Center, has an IBM 370/158 and an IBM 370/155 in McLean for its batch and remote batch processing services.

COMPANY HIGHLIGHT

UNITED COMPUTING SYSTEMS, INC.
2525 Washington Street
Kansas City, MO 64108
(816) 221-9700

G. Jack Lorenz, President
Wholly-owned subsidiary of
United Telecommunications, Inc.
Total employees: 620
Total operating revenues, fiscal
year end 12/31/76: \$33,600,000

THE COMPANY

- United Computing Systems, Inc. (UCS) was formed in 1967 when United Telecommunications, Inc. acquired Automated Data Service Company, a small remote computing and data base management services vendor. United Telecommunications is also the parent company of the United Telephone Systems, the second largest independent telephone company in the nation serving 3.3 million U.S. telephones.
- UCS currently provides remote computing services to 2000 companies in a variety of industries.
- Revenues in 1976 were \$33.6 million, up 87% from 1975 revenues of \$17.95 million in 1975. Net earnings for the same period rose 166% from \$902,000 to \$2.4 million.
- UCS 620 employees are segmented as follows:

Marketing	57%
RCS sales & support	50
Software sales & support	7
Operations and R&D	26
General and Administrative	8
International	9
	<u>100%</u>

- UCS has acquired the following companies to facilitate entering new markets and increase its customer base:
 - Foresight Systems, Inc., Los Angeles, was acquired in mid 1975. It provides professional services and its FORESIGHT software products to clients throughout the world.
 - International Timesharing Corporation (ITS), Chaska, Minnesota, was acquired in late 1975. With 1975 revenues of \$5.3 million, ITS supplied 28 cities with remote computing and interactive processing for general business applications.
 - Standard Information Systems, Boston, was acquired in November 1976 and had 1975 revenues of \$5.5 million. It offers interactive processing via CDC 3600 mainframes.

COMPANY HIGHLIGHT/UNITED COMPUTING SYSTEMS, INC.

- Infonational, San Diego, was also acquired in November 1976 with 1975 revenues of approximately \$2 million. It markets software products, principally a general accounting package.
- London University Computing Services, Ltd., London, was acquired in early 1977. With 1976 revenues of approximately \$1.5 million, LUCS offers remote computing services with engineering and scientific applications to about 55 clients. It has CDC 6500 mainframes.
- In 1976, UCS was awarded a Teleprocessing Services Procurement Program (TSP) classification by the U.S. Government. This should significantly increase the company's ability to penetrate the Federal market.

KEY PRODUCTS AND SERVICES

- In 1976, remote computing services produced approximately 97% of revenues with software product sales and local batch processing providing the remainder. By FYE 1977 RCS will have declined to 90% of revenues. Remote computing includes remote batch, interactive, deferred interactive, and remote job entry processing.
- UCS offers principally data management services although specialized processing is also available over APEX/SL the company's national network. Principal products include:
 - FORESIGHT: a business planning language used for financial modeling and management reports added when UCS acquired Foresight Systems, Inc. FORESIGHT is one of 25 software products named on the Datapro honor roll for 1975.
 - IFM, Interactive File Manager: a file management and data base system which can handle such general business applications as inventory control, personnel management, and accounting information systems.
 - DSM, Distributed Storage Management: a service designed to reduce the cost of remote computing through distributed processing technology. It employs intelligent terminals, mini-computers, large computers, and customized software. It is being directed at the smaller business marketplace.
 - FORETAX: for federal, municipal, state, and franchise income tax reporting, planning, and consolidation, and ADR guideline asset depreciation calculations. This product was also added through the Foresight Systems acquisition.
 - System 2000: a data base management system developed by MRI Systems Corporation and licensed to UCS.

COMPANY HIGHLIGHT/UNITED COMPUTING SYSTEM, INC.

- The company's library of approximately 400 programs also includes:
 - IMSL: a library of mathematical and statistical routines
 - LESS/TIME: a project scheduling system based on the critical path management concept.
 - SACM, Surface Approximation and Contour Mapping Program: for analyzing three-dimensional surfaces, reservoir volumetric calculations and producing contour maps
 - PROSE: A calculus derived language.
 - LSF: Logically Structured FORTRAN

APPLICATIONS: The majority of applications revenues are for utility processing, as shown in the following distribution of revenues:

● Utility Processing	50%
● Scientific and engineering, such as seismic analysis.	25%
● General business and financial, such as income tax reporting, inventory control, personnel management, and accounting information systems.	13%
● Specialty	12%

INDUSTRY MARKETS: As indicated by the table below, revenues are somewhat concentrated in the manufacturing industry and telephone utilities industries. Approximately 6%, or \$2.0 million, of 1976 sales are captive.

Manufacturing - discrete & process	34%
Utilities	26
Wholesale Distribution	8
Banking/Finance	3
Government	3
Transportation	3
Education	2
Other	<u>21</u>
	100%

COMPANY HIGHLIGHT/UNITED COMPUTING SYSTEMS, INC.

GEOGRAPHIC MARKETS:

- Almost one-third of UCS sales are from the Washington, D.C. area and the Northeast and New England states. The rest is fairly well distributed between the Southern states, the North Central and northern Midwest, and the Mountain and Pacific states.
- UCS's network serves 130 cities in the U.S. and Canada with branch offices located in the following 29 cities:

Atlanta, GA	New York, NY
Boston, MA	Oklahoma City, OK
Chicago, IL	Orange County, CA
Cleveland, OH	Palo Alto, CA
Columbus, OH	Philadelphia, PA
Dallas, TX	Phoenix, AZ
Denver, CO	St. Louis, MO
East Orange, NJ	San Francisco, CA
Ft. Wayne, IN	Santa Ana, CA
Houston, TX	Seattle, WA
Kansas City, MO	Tampa, FL
Los Angeles, CA	Tulsa, OK
Milwaukee, WI	Washington, DC
New Haven, CT	Calgary and Alberta, Canada

COMPUTER HARDWARE AND SOFTWARE:

- UCS has one main computer center in Kansas City and three smaller centers (added through acquisitions) in Chaska, Minnesota; Boston, Massachusetts; and London. Each of the smaller centers is currently processing its own clients; in the long term future, all will be consolidated in Kansas City.
- UCS has developed its own operating systems for the equipment in its Kansas City data centers. The data center equipment includes:

2	CDC	6600
1	CDC	6500
5	CDC	3600
4	CDC	3300
2	CDC	Cyber 174
1	CDC	Cyber 175

A Cray Research Cray 1 computer has been ordered and installation is expected during 1978. UCS will lease the mainframe.

COMPANY HIGHLIGHT/UNITED COMPUTER SYSTEMS, INC.

- All these systems are interconnected for backup. In addition, UCS has a 700 kilowatt uninterruptable power system and a dual power feed from the local utility. This backup system was tested during K.C.'s recent deluge - 19 inches in one day - which caused massive flooding. UCS maintained uninterrupted processing communication capability throughout the disaster.
- The network consists of dial-up, leased, and IN-WATS lines and regional concentrators. Interactive users access the leased lines; remote batch users access IN-WATS.

COMPANY HIGHLIGHT

WESTERN UNION CORPORATION
One Lake Street
Upper Saddle River, NJ 07458
(201) 825-5000

Russell W. McFall,
Chairman & President
Public corporation, NYSE
Total employees: 13,500
Operating revenues, fiscal year
end 12/31/76: \$607,308,000

THE COMPANY

- Western Union Corporation, through its subsidiaries, provides telecommunication systems and services to industry, government, and consumers; various information processing services; and rental and maintenance of data communications terminals.
- Operating revenues for the corporation increased 6% in 1976 from \$572 million in 1975. Net income was up 3%, from \$33.1 million in 1975 to \$34 million in 1976.
- The corporation is a holding company for The Western Union Telegraph Company, its major subsidiary. It also has various other subsidiaries including those in the Western Union Teleprocessing Group and Western Union Data Services.
 - The Western Union Telegraph Company, a communications common-carrier with 1976 revenues of \$540 million, operating income of \$71 million, and 11,000 employees. This group includes teletypewriter networks (TWX and Telex), private communications services, public communications services (telegram, money order, mailgram) and other services.
 - The Western Union Teleprocessing Group includes National Sharedata Corporation, Telestat Systems, Inc., Western Union Information Systems, PR Newswire Association Inc. and Distronics Corporation. The Group had \$39 million in 1976 revenues, an increase of 11% over 1975. The increase was mainly a result of National Sharedata's expansion and the corporate acquisition of Telstat Systems.
 - Western Union Data Services, with \$24.7 million revenues in 1976, rents and maintains data communications terminals.
- This Highlight will focus on the activities of the Teleprocessing Group which accounted for 6.4% of total corporate revenues in 1976 and 6.1% in 1975.

COMPANY HIGHLIGHT/WESTERN UNION CORPORATION

KEY PRODUCTS AND SERVICES

- National Sharedata Corporation, under President Thomas B. Medley, provides facilities management to commercial banks in the U.S. Through the FM contracts, it also supplies data processing services to local banks and businesses. Acquired by Western Union in 1973, National Sharedata generated \$27.1 million revenues in 1976, an increase of 24% over its \$21.8 million revenues in 1975. Although it has 450 bank and 1000 commercial customers, 95% of its applications revenues are produced by the bank clients and only 5% by commercial processing.
- Telstat Systems, Inc., under President Penny Kaniclides, supplies automated securities price information to financial industry investment managers. Acquired in 1976, revenues during its first year as a Western Union subsidiary were \$5.5 million, an increase of 90% over its 1975 revenues of \$2.9 million.
- Western Union Information Systems under Vice President General Manager Ernest Hillman, designs, develops, manufacturers, and installs micro-processor-based data communications equipment, primarily for The Telegraph Company. Together with the PR Newswire Association, Inc., it produced approximately \$4.2 million* revenues in 1976.
- PR Newswire Association, Inc., under President David Steinberg, distributes press and news releases via two private wire systems to a variety of government and corporate clients. It was acquired in 1970.
- Distronics Corporation, under President Marshall Campbell, provides interactive computer services to wholesale distributors. Acquired in 1971, its 1976 revenues were an estimated \$2.2 million*. Key applications for its approximately 65 clients are inventory control, accounts payable/receivable, general ledger, and sales analysis.

APPLICATIONS

- More than 90% of the Teleprocessing Group's services revenues are from specialty applications. The majority of these are for banking applications through National Sharedata. Other subsidiaries offer industry-specialized applications for insurance companies, wholesale distributors, and other financial industry clients.
- The remaining 10% of revenues are derived from general business applications.

* INPUT estimate.

COMPANY HIGHLIGHT/WESTERN UNION CORPORATION

INDUSTRY MARKETS

- National Sharedata's revenues are derived 95% from banking clients. The other 5% are from commercial clients and schools.
- Distronics clients are 100% wholesale distributors for plumbing, heating, electrical, airconditioning, and piping supplies.
- Other subsidiaries' targeted markets are financial, corporate, government, services, and industrial clients.

GEOGRAPHIC MARKETS

- National Sharedata customers are evenly distributed in the Midwest and Southwest regions of the U.S. Distronics users are primarily located in the East with the remainder distributed throughout the U.S.
- National Sharedata Corporation is located at 800 One Main Place, Dallas, Texas 75250; Distronics Corporations is located at 1060 Kings Highway North, Cherry Hill, NJ 08002.

COMPUTER HARDWARE AND SOFTWARE National Sharedata has 38 computer centers including 7 satellite centers. Distronics has one computer center with an IBM 370/145 in St. Louis.

COMPANY HIGHLIGHT

XEROX COMPUTER SERVICES
5310 Beethoven Street
Los Angeles, CA 90066
(213) 390-3461

Haig Bazoian, President
Operating Unit of Xerox
Corporation, Stamford CT
Total employees: 650
Total computer services sales,
12/31/77: \$28,600,000*

THE COMPANY

- Xerox Computer Services (XCS) was founded in 1970 to provide interactive remote computing services to small and medium-sized manufacturers, wholesalers, local governments, and utilities. It now has more than 500 users, primarily manufacturers.
- It claims to be the major force in providing time sharing services to the discrete manufacturing industry. Major competitors are ITEL Data Services, Automatic Data Processing, and Keydata.
- A sales and support force of 350 appears to be well trained in both the targeted industries and the applications provided.
- XCS is backed by a strong parent corporation. Xerox Corporation has \$4.4 billion revenues and \$358.9 million net earnings (\$4.51 per share) in 1976. First quarter 1977 revenues were \$1.19 billion, up 15% over first quarter 1976; net earnings were up 12% to \$91.6 million. XCS revenues increased 36% between FYE 1976 and FYE 1977 from \$21 million to 28.6 million.
- The company recently announced that Xerox Corporation, on behalf of XCS, had reached an agreement in principle to acquire ARISTA Manufacturing Systems of North Carolina. ARISTA, with FYE 1976 revenues of approximately \$1.5 million, markets manufacturing applications software packages for medium and large IBM mainframes. The acquisition, expected to reach completion this month, will allow XCS to enter a new segment of the manufacturing marketplace.

KEY PRODUCTS AND SERVICES

- One hundred percent of XCS services are interactive remote computing services. Software packages will be added in the future if the ARISTA acquisition is completed.

* Estimate by INPUT

COMPANY HIGHLIGHT/XEROX COMPUTER SERVICES

- The company's primary product is its Interactive Accounting System (IAS). With more than 500 users currently, IAS has grown 600% since 1973. It offers distribution and manufacturing users the following services: general ledger, accounts payable, accounts receivable, sales management, inventory control, sales order entry and billing, payroll, and labor distribution.
- Manufacturing users are also offered bill of materials processing material requirements planning, master scheduling, capacity planning, production control, and variance accounting.
- XCS has used the IAS packages to develop a product which offers city planning, fire, safety, census, and some accounting services to public agencies.

APPLICATIONS: XCS products are primarily (84%) for general business application. Another 15% are for specialty application by public agencies. The remaining 1% are scientific and engineering applications which XCS has recently begun to offer existing general business users. They include general timesharing jobs utilizing COBOL, APL, FORTRAN, and BASIC.

INDUSTRY MARKETS Approximately 56% of XCS revenues are derived from the discrete manufacturing industry, 26% from wholesale distributors, 15% from public agencies and municipalities and utilities, and 3% from other industry groups.

GEOGRAPHIC MARKETS

- Approximately half of the company's revenues are produced by the pacific Coast region of the U.S. The other half are evenly divided between the Eastern and Central U.S. XCS does not derive any revenues from either the U.S. Mountain States region or other countries.
- XCS has offices in Chicago, Cleveland, Dallas, Houston, Jericho (NY), Los Angeles, Milwaukee, Philadelphia, Rochelle Park (NJ), San Diego, and South San Francisco.

COMPUTER HARDWARE AND SOFTWARE

- The company's primary computer facility in Los Angeles has 33 Sigma computers with a total on-line customer data base of more than 12 billion characters. The mainframes are:
 - 8 Xerox Sigma 9's
 - 5 Xerox Sigma 7's
 - 8 Xerox Sigma 3's
 - 12 Xerox Model 530's

- In addition, five XCS branch offices have smaller computers and high speed print capability.

