

ON-LINE DATA BASE MARKET OPPORTUNITIES

1985 - 1990

INPUT

YOLD

000000

ON-LINE DATA BASE
MARKET OPPORTUNITIES, 1985-1990



Digitized by the Internet Archive
in 2015

ON-LINE DATA BASE MARKET OPPORTUNITIES, 1985-1990

ABSTRACT

This study, part of the Market Analysis and Planning Service (MAPS) Program, analyzes opportunities for on-line data base services over the 1985-1990 timeframe. The analysis determines and forecasts user expenditures for the U.S. by three vendor types--data base vendors, information services vendors, and value-added network vendors. The study also breaks the market down in two other dimensions: (1) five data base groups--security, financial, credit, bibliographic/text, news, and "other" (these five are in turn broken down into 15 data base types) and (2) by the standard 14 industry sectors. A competitive analysis determines the market share of 28 vendors in the data base vendor market segment and 36 vendors in the information services market segment.

This report contains 193 pages, including 58 exhibits.

ON-LINE DATA BASE
MARKET OPPORTUNITIES, 1985-1990

CONTENTS •

	<u>Page</u>
I INTRODUCTION.....	1
A. Scope	1
B. Methodology	3
C. Purpose	5
II EXECUTIVE SUMMARY	7
A. Data Base Information Services - A \$33 Billion Market Potential	8
B. The Action Remains with Information Services Vendors	11
C. Dynamic Growth Greatest with News Information Services	13
D. Services Overtake Banking and Finance as Largest Industry Sector	15
E. Pay Attention to Products	17
F. Market Opportunities Warrant Special Attention	18
III MARKET ANALYSIS AND FORECAST	21
A. Market Structure	22
1. Market Participants	22
a. Data Base Vendors	22
b. Information Services Vendors	22
c. Value-Added Network Vendors	24
d. Intermediaries	24
e. End Users	25
2. Market Definition	25
B. Market Forecasts	28
1. Methodology	28
2. Forecast of User Expenditures	31
C. Influencing Factors	41
1. Technology	41
2. Competition	47
IV MARKET ANALYSIS BY DATA BASE SECTOR.....	51
A. Securities/Financial Group	51
1. Securities and Commodities	51
a. Types	51
b. Market Forecast	52
c. Key Data Bases and Vendor Services	55

	<u>Page</u>
2. Financial and Economic	56
a. Types	56
b. Market Forecast	57
c. Key Data Bases and Vendor Services	57
3. Industry	65
a. Types	65
b. Market Forecast	66
c. Key Data Bases and Vendor Services	68
B. Credit Group	73
1. Types	74
2. Market Forecast	75
3. Key Data Bases and Vendor Services	75
C. Text/Bibliographic Group	79
1. Bibliographic	79
a. Types	79
b. Market Forecast	80
c. Key Data Bases and Vendor Services	80
2. Legal/Accounting	85
a. Types	85
b. Market Forecast	86
c. Key Data Bases and Vendor Services	88
D. News Group	93
1. Types	93
2. Market Forecast	93
3. Key Data Bases and Vendor Services	95
E. Other Group	98
1. Marketing	98
a. Types	98
b. Market Forecast	99
c. Key Data Bases and Vendor Services	99
2. Medical	103
a. Types	103
b. Market Forecast	104
c. Key Data Bases and Vendor Services	104
3. International	108
a. Types	108
b. Market Forecast	109
c. Key Data Bases and Vendor Services	109
4. Demographic	113
a. Types	113
b. Market Forecast	114
c. Key Data Bases and Vendor Services	114
5. Resources	118
a. Types	118
b. Market Forecast	119
c. Key Data Bases and Vendor Services	119

	<u>Page</u>
6. Real Estate	124
a. Types	124
b. Market Forecast	124
c. Key Data Bases and Vendor Services	126
7. Econometric	129
a. Types	129
b. Market Forecast	130
c. Key Data Bases and Vendor Services	133
8. Other	135
a. Types	135
b. Market Forecast	136
c. Key Data Bases and Vendor Services	136
V PRODUCT AND MARKETING ISSUES	141
A. Product Strategies	141
B. Marketing Issues	153
VI COMPETITIVE ENVIRONMENT	155
A. Competitive Structure	155
B. Key Vendors and Products	163
1. Mead Data Central	164
2. Lockheed/Dialog	165
3. Telerate, Inc.	166
4. Dow Jones	166
5. TRW Information Services	168
6. GEISCO	168
7. Dun & Bradstreet	169
8. McGraw-Hill, Inc.	170
9. American Express	172
10. AT&T	173
11. IBM	173
12. Knight-Ridder Newspapers	174
APPENDIX A: DEFINITIONS.....	177
A. Revenue	177
B. Service Modes	178
C. Data Base	183
D. Other Considerations	184
APPENDIX B: RELATED INPUT REPORTS	185
APPENDIX C: QUESTIONNAIRE	187

ON-LINE DATA BASE
MANAGEMENT OPPORTUNITIES, 1985-1990

EXHIBITS

		<u>Page</u>
I	-1 Interview Profile	2
II	-1 Data Base Information Services--a \$33 Billion Market Potential	9
	-2 The Action Remains with Information Services Vendors	12
	-3 Dynamic Growth Greatest with News Information Services	14
	-4 Services to Overtake Banking and Finance As Largest Industry Sector	16
	-5 Pay Attention to Products	19
	-6 Market Opportunities Warrant Special Attention	20
III	-1 On-Line Data Base Services Market Participants	23
	-2 Typical End Users of On-Line Data Base Services	26
	-3 Market Segmentation of On-Line Data Base Services by Group and Sector	30
	-4 Growth in the U.S. On-Line Data Base Services Marketplace, 1981-1984	32
	-5 Growth in the Number of U.S. Data Base Offerings by Sector, 1981-1984	33
	-6 Distribution of User Expenditures for On-Line Data Base Services by Service Type in 1984	34
	-7 Forecast of User Expenditures for On-Line Data Base Services by Service Type, 1985-1990	36
	-8 Forecast of User Expenditures for On-Line Data Base Information Services by Mode of Delivery, 1985-1990	38
	-9 Forecast of User Expenditures for On-Line Data Base Information Services by Data Base Type, 1985-1990	39
	-10 Forecast of User Expenditures for On-Line Data Base Information Services by Industry Sector, 1985-1990	40
	-11 Cost Comparison - Optical Memories versus Magnetic Disk	42
	-12 Technology Trends - Optical Disks	43
	-13 Forecast of Personal Computer Sales to Home and Office Markets by Units, 1985-1990	44
	-14 Forecast of Modem Sales to Home and Office Personal Computer Markets by Units, 1985-1990	46
	-15 On the Move	48

	<u>Page</u>
IV -1 Forecast of User Expenditures for Securities and Commodities On-Line Data Base Services by Vendor Type, 1985-1990	53
-2 Forecast of User Expenditures for Securities and Commodities On-Line Data Base Information Services by Industry Sector, 1985-1990	54
-3 Forecast of User Expenditures for Financial/Economic On-Line Data Base Services by Vendor Type, 1985-1990	58
-4 Forecast of User Expenditures for Financial/Economic On-Line Data Base Information Services by Industry Sector, 1985-1990	59
-5 Forecast of User Expenditures for Industry On-Line Data Base Services by Vendor Type, 1985-1990	67
-6 Forecast of User Expenditures for Industry On-Line Data Base Information Services by Industry Sector, 1985-1990	69
-7 Forecast of User Expenditures for Credit On-Line Data Base Services by Vendor Type, 1985-1990	76
-8 Forecast of User Expenditures for Credit On-Line Data Base Information Services by Industry Sector, 1985-1990	77
-9 Forecast of User Expenditures for Bibliographic On-Line Data Base Services by Vendor Type, 1985-1990	81
-10 Forecast of User Expenditures for Bibliographic On-Line Data Base Information Services by Industry Sector, 1985-1990	82
-11 Forecast of User Expenditures for Legal/Accounting On-Line Data Base Services by Vendor Type, 1985-1990	87
-12 Forecast of User Expenditures for Legal/Accounting On-Line Data Base Information Services by Industry Sector, 1985-1990	89
-13 Forecast of User Expenditures for News On-Line Data Base Services by Vendor Type, 1985-1990	94
-14 Forecast of User Expenditures for News On-Line Data Base Information Services by Industry Sector, 1985-1990	96
-15 Forecast of User Expenditures for Marketing On-Line Data Base Services by Vendor Type, 1985-1990	100
-16 Forecast of User Expenditures for Marketing On-Line Data Base Information Services by Industry Sector, 1985-1990	101
-17 Forecast of User Expenditures for Medical On-Line Data Base Services by Vendor Type, 1985-1990	105
-18 Forecast of User Expenditures for Medical On-Line Data Base Information Services by Industry Sector, 1985-1990	106
-19 Forecast of User Expenditures for International On-Line Data Base Services by Vendor Type, 1985-1990	110

		<u>Page</u>
-20	Forecast of User Expenditures for International On-Line Data Base Information Services by Industry Sector, 1985-1990	111
-21	Forecast of User Expenditures for Demographic On-Line Data Base Services by Vendor Type, 1985-1990	115
-22	Forecast of User Expenditures for Demographic On-Line Data Base Information Services by Industry Sector, 1985-1990	116
-23	Forecast of User Expenditures for Resources On-Line Data Base Services by Vendor Type, 1985-1990	120
-24	Forecast of User Expenditures for Resources On-Line Data Base Information Services by Industry Sector, 1985-1990	121
-25	Forecast of User Expenditures for Real Estate On-Line Data Base Services by Vendor Type, 1985-1990	125
-26	Forecast of User Expenditures for Real Estate On-Line Data Base Information Services by Industry Sector, 1985-1990	127
-27	Forecast of User Expenditures for Econometric On-Line Data Base Services by Vendor Type, 1985-1990	131
-28	Forecast of User Expenditures for Econometric On-Line Data Base Information Services by Industry Sector, 1985-1990	132
-29	Forecast of User Expenditures for Other On-Line Data Base Services by Vendor Type, 1985-1990	137
-30	Forecast of User Expenditures for Other On-Line Data Base Information Services by Industry Sector, 1985-1990	138
V	-1 Typical Data Base Pricing Arrangements for On-Line Data Base Information Services	143
	-2 Financial Analysis Utilizing Personal Computers and Financial and Economic On-Line Data Base Services	145
	-3 Pre-Tax Operating Margins for Business Information Industry	148
	-4 The Emerging Videotex Market	152
VI	-1 Data Base Vendors' Share of On-Line Data Base Services Market in 1984	158
	-2 Information Services Vendors' Share of On-Line Data Base Services Market in 1984	160

I INTRODUCTION

I INTRODUCTION

A. SCOPE

- This report, produced by INPUT as part of the Market Analysis and Planning Service (MAPS), analyzes market opportunities for on-line data base information services.
- Extensive review of vendor-produced literature and follow-up interviews added to the comprehensiveness of the analysis.
- The research conducted in this report includes 20 vendor interviews distributed as shown in Exhibit I-1.
- Interviews were conducted during August and September 1985.
- Definitions of terms used in this report appear in Appendix A.
- Related research reports appear as Appendix B.
- A copy of the vendor questionnaire is included as Appendix C.
- INPUT invites client inquiries and comments on the information presented in this report.

EXHIBIT I-1

INTERVIEW PROFILE

VENDOR TYPE	NUMBER OF INTERVIEWS		
	ON-SITE	TELEPHONE	TOTAL
Data Base Vendors	-	5	5
Information Services Vendors	-	13	13
Value-Added Network Vendors	-	2	2
Total	-	20	20

B. METHODOLOGY

- This study considered markets for data base services in the U.S. For example, the use of international data bases by U.S. firms is included, whereas revenue from the sale of U.S. bibliographic data base services in Europe is not.
- The report deals primarily with markets and opportunities for data base services delivered on-line by data base vendors, information services vendors, and value-added network vendors.
- There are a number of other data delivery methods, such as printed report services, consulting services, seminars, etc. Markets for data base services using other delivery methods are mentioned but not forecast in detail.
- The study forecasts user expenditures for data-base-related services resulting in revenue to data base vendors, information services vendors, and value-added network vendors.
- End-user expenditures by individuals (excluding consumers) are considered. However, the research focuses primarily on end-user expenditures by corporations.
- Although data-base-related services used by governments are considered, the report concentrates on the commercial sector of the U.S. economy.
- Government fees from the sale of data base services to end users and from the sale of data through information services vendors are not included in the market figures.
- The forecasts in this report include a 6% annual price increase factor due to inflation. The difference between 6% and the annual increase in the gross national product (GNP) deflator is assumed to be offset by technology improvements.

- Where data base vendors such as Predicasts, Inc. offer data bases on subscription (royalty) through information services vendors, expenditures for subscription services are separately forecast. Every attempt was made to avoid "double counting." An attempt was made to separate end-user expenditures for data base subscriptions (data bases created and maintained by information services vendors such as Mead or DRI) from end-user expenditures for access and related computing services.
- Data base vendors such as Petroleum Information Corporation offering on-line data base services either directly or through value-added network vendors were classified as information services vendors.
- End-user expenditures for on-line data base telecommunications services were limited to value-added network vendors including Tymnet and Telenet. User expenditures for information services vendor network services are included as part of total end-user expenditures for information services vendors' data base services.
- Each of the 15 data base sectors listed in Exhibit III-3 were separately forecasted (see Chapter IV, Market Analysis by Data Base Sector).
 - The six industry sectors with highest total 1983 end-user expenditures were retained for additional analysis. End-user expenditures for the remaining eight were included in total end-user expenditures for the "other" sector.
 - The data base sectors were summarized by both vendor type and industry sector.
- In-depth interviews with selected vendors provided background material for analysis and served to validate methodology.

C. PURPOSE

- The purpose of the study is to analyze both present and future markets and to provide the basic technical background and recommendations necessary for market penetration and expansion.
- This area of research was selected because of high client interest, rapid market change, and accelerating market growth.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

- In an electronic age, businesses have an almost insatiable appetite for information that has been categorized, summarized, and organized in what are called data bases. The term "data base" initially referred to either numeric or reference data. More recently, textual, graphic, and image information are becoming important. In this report a more accurate designation--information data bases and data base information services--is used.
- The high cost of information gathering, entry, and maintenance have made it increasingly cost effective to obtain data bases from outside sources. Additionally, improved technology related to electronic publishing has made possible the creation of large information data bases as a by-product of printed publications.
- Outside sources deliver information data bases in a variety of forms:
 - By printed publications such as directories and abstracts.
 - By automated means off-line--such as magnetic tape, microfiche, and, more recently, video disk and flexible magnetic disk.
 - By automated means on-line through information services and value-added network vendors.

- Initially, on-line data base information services were delivered to businesses domestically. However, services have expanded to both businesses and individuals, both within the U.S. and internationally.
- This study focuses on opportunities for on-line data base information services to corporations and individual businesspeople (as opposed to consumers) in the U.S.

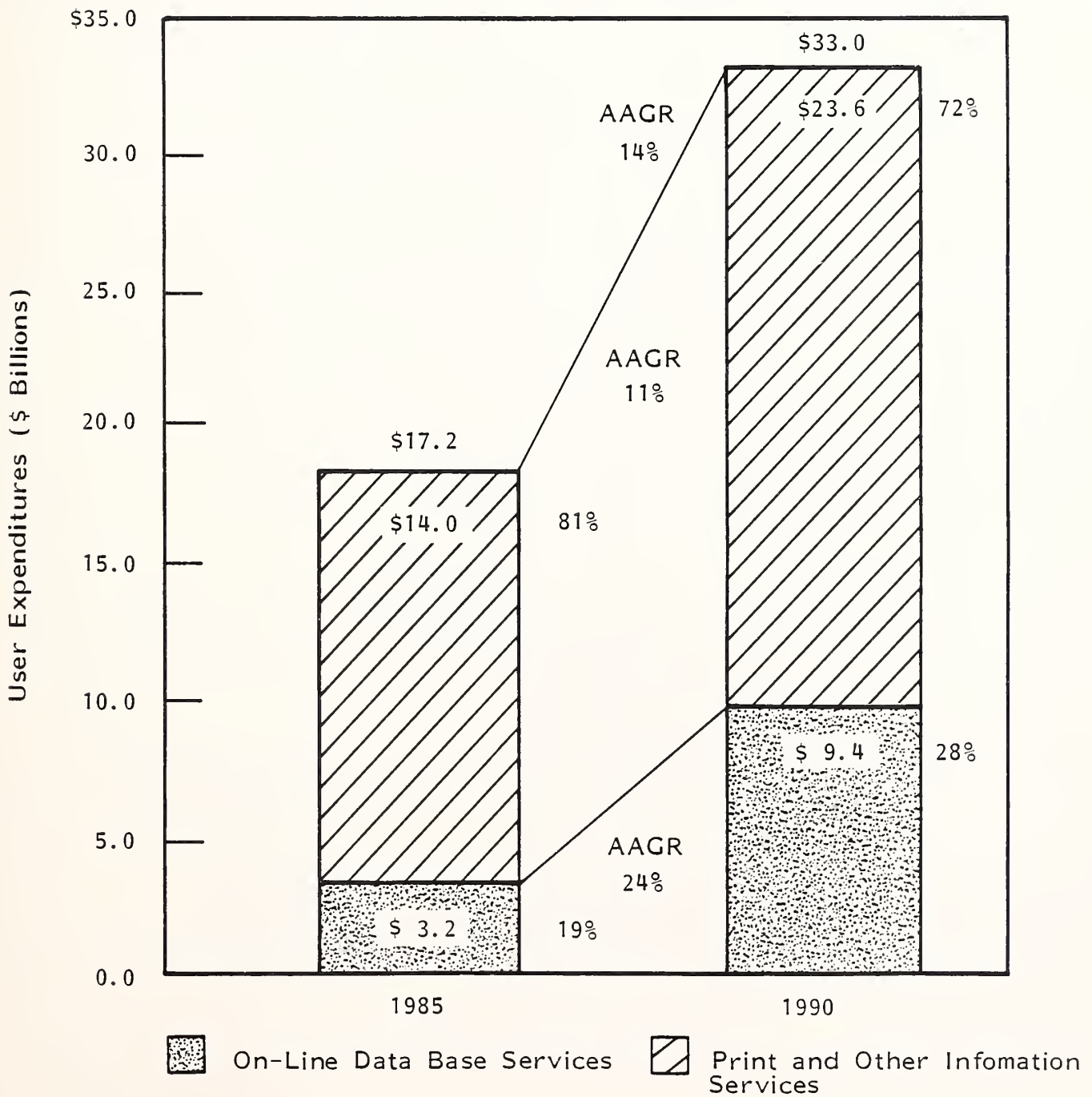
A. DATA BASE INFORMATION SERVICES - A \$33 BILLION MARKET POTENTIAL

- The market potential for offering on-line data base services seems almost unlimited. However, economic conditions, among other causes, caused a slackening of the market pace in 1984.
- The existing market for on-line data base services, currently in excess of \$3.2 billion, represents under 20% of the total 1985 market.
- The greater portion of this market, approximately \$14 billion (in excess of 80%), is supplied through:
 - General printed publications - 63%.
 - Automated off-line services, including tape and microfiche - 10%.
 - Other services, including specialized intermediary services - 8%.
- Overall industry growth, approximately 14% annually over the forecast period, will increase data base information services market potential to about \$33 billion by 1990, as shown in Exhibit II-1. The rate of total expenditures is also rising 23-24% AAGR.

EXHIBIT II-1

DATA BASE INFORMATION SERVICES A \$33 BILLION MARKET POTENTIAL

Forecast of Data Base Information Services Market
1985-1990



- On-line data base information services, even with an annual growth double that of other delivery modes, will still represent only 28% of the total 1990 market, a truly excellent opportunity for vendor market entry and expansion.
- The push is now toward the end user, with 17 million PCs in homes and offices versus 10 million in 1983.
- Modems have become widely available and less expensive--under \$400. Supplied with intelligence, speed (1200 baud), and easy-to-use software and firmware, modems will support the predicted growth.
- Some of the leading market participants to watch are:
 - Lockheed Information Services.
 - Mead Data Central.
 - Dow Jones Information Services.
 - Reader's Digest (the Source).
 - H&R Block (CompuServ).
 - NewsNet.
 - Telerate (McGraw-Hill).
- The "hot" data bases today are:
 - NewsNet.
 - Telerate for its U.S. interest and foreign exchange rate forecasts.

- NEXIS and LEXIS.
- Quotron stock, bond, and commodity quotes.

.

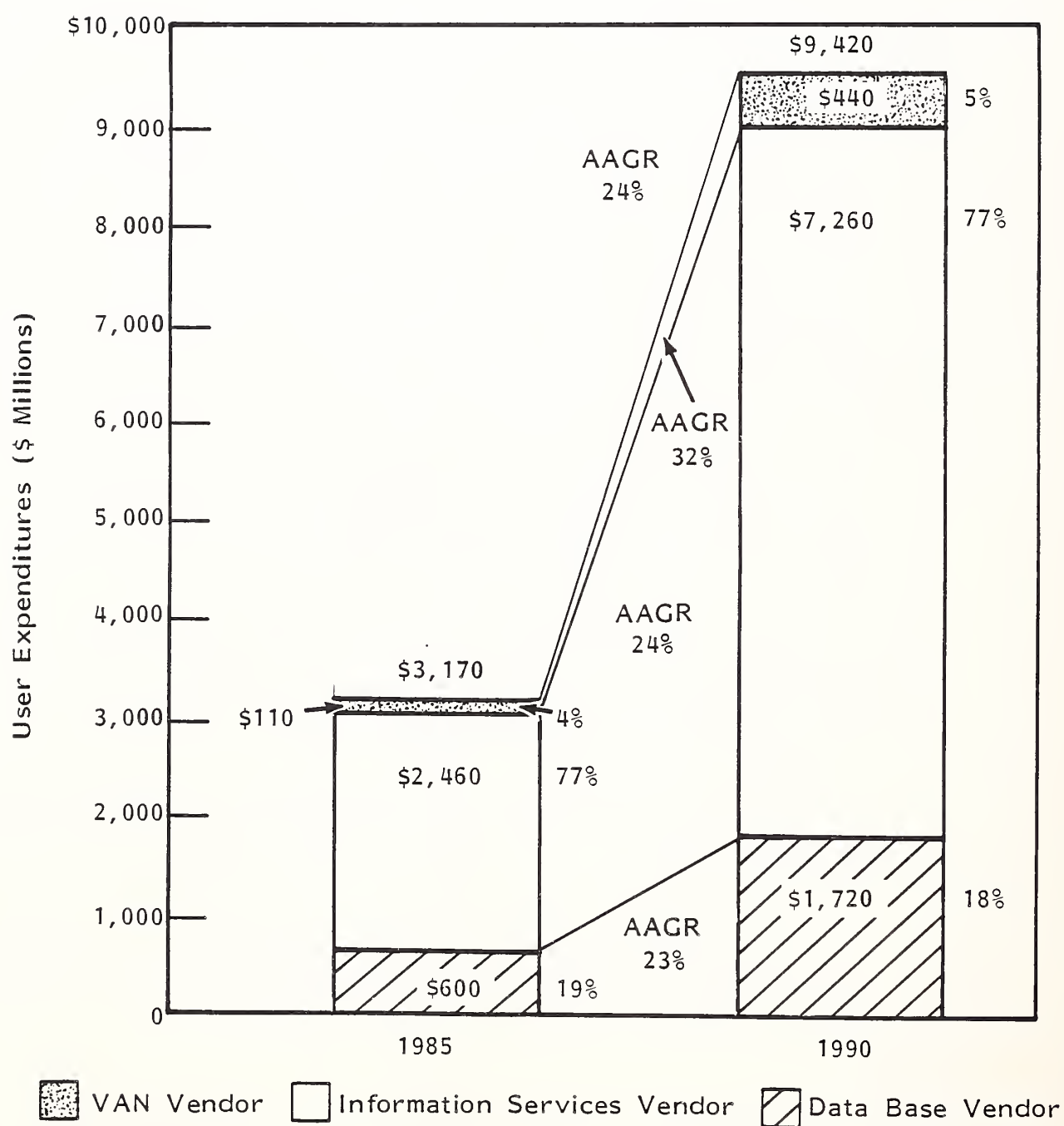
B. THE ACTION REMAINS WITH INFORMATION SERVICES VENDORS

- Information services vendors (with their telecommunications networks) will continue to be the center of action, as seen in Exhibit II-2. The 1985 market is divided between:
 - Data base vendors producing and licensing data bases, with revenues approaching \$600 million or 19% of the market.
 - Information services vendors, offering their own and other vendors' data bases on-line, with revenues approaching \$2.5 billion or 77% of the market.
 - Value-added network vendors delivering data base and information services vendor offerings to geographically disbursed end users, with revenues about \$110 million or 4% of the total market.
- Vendors' relative share of the nearly \$9.5 billion 1990 market will remain substantially the same as in the present market, but with some growth by VAN vendors at the expense of data base vendors.
- The distinction between vendor types is blurring and may in fact be much less distinguishable by 1990.
 - Specialty data base vendors are finding it cost-effective to offer data bases that are coupled with specialty software to end users using VANs.

EXHIBIT 11-2

THE ACTION REMAINS WITH INFORMATION SERVICES VENDORS

Forecast of On-Line Data Base Information Markets
1985-1990



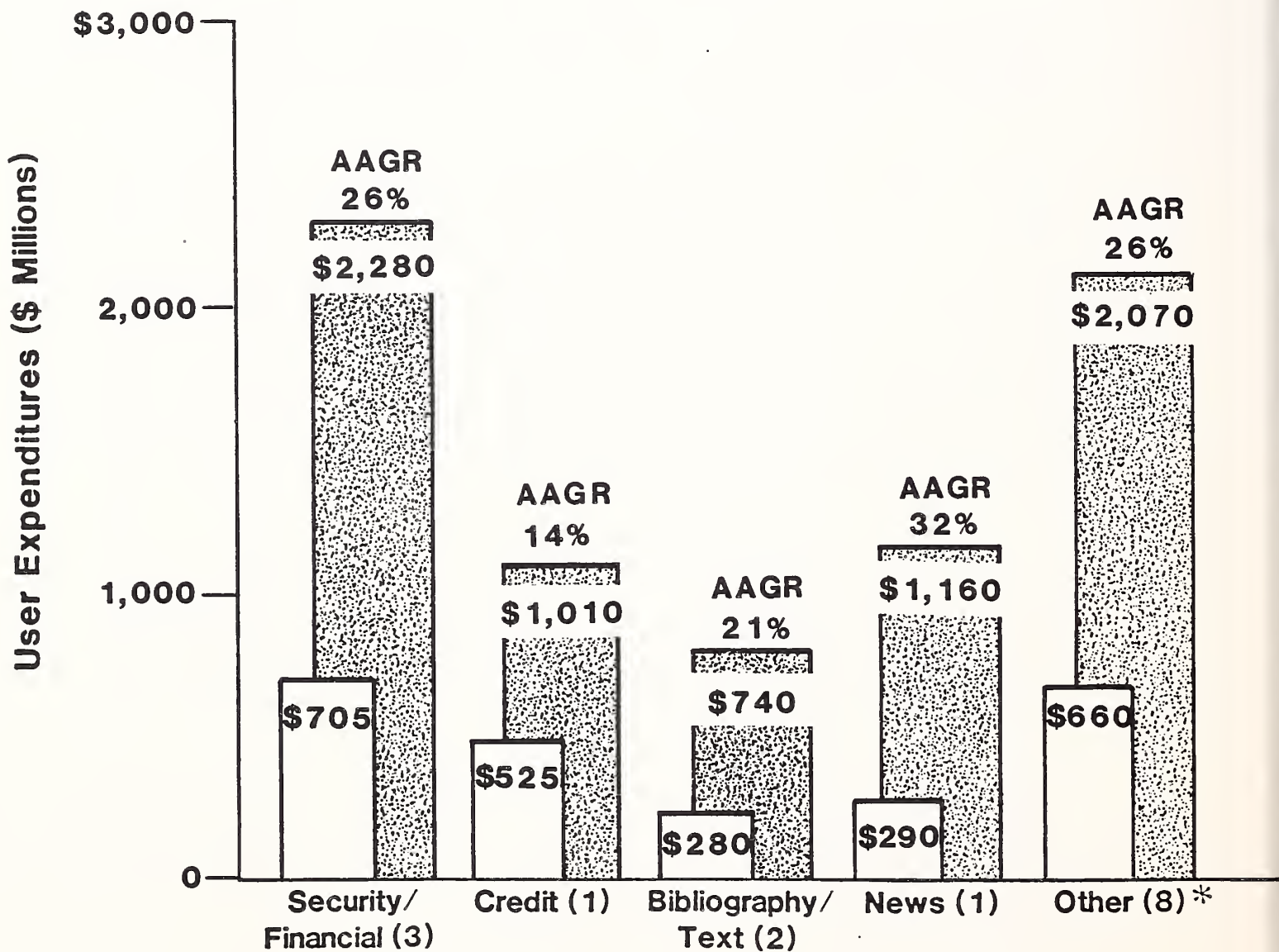
- Information services vendors, such as ADP and GEISCO, are offering VAN services.
- VAN vendors, such as GTE and Medi-Net, are offering data base information services.
- Vendors such as IBM, AT&T, and Knight-Ridder are entering the on-line information services marketplace in significant ways.

C. DYNAMIC GROWTH GREATEST WITH NEWS INFORMATION SERVICES

- With the number of news data bases approaching 300 (the three-year annual growth in number of data bases is almost 140%), and with data base vendors such as Mead Data Central, NewsNet, Knight-Ridder, Telerate, Lockheed Information Services, Reader's Digest, and Dow Jones active in the market, user expenditures will grow by a factor of four, or over 30% annually over the forecast period, as shown in Exhibit II-3. The entry of vendors such as IBM and AT&T could well accelerate market growth beyond the forecast 32% annual rate late in the forecast period.
- The security/financial group (including security and commodity, financial and economic, and industry data bases), which accounts for nearly 30% of total expenditures for information services vendors products and services, will remain the major data base group.
- Data base services related to consumer and corporate credit, in a market where consumer credit information exists on 85% of U.S. households, will experience only moderate growth, resulting in user expenditures of \$1,010 million by 1990.

DYNAMIC GROWTH GREATEST WITH NEWS INFORMATION SERVICES

Forecast of On-line Data Base Information Services Markets
1985-1990



□ 1985 Total \$2,460 Million ▨ 1990 Total \$7,260 Million

* Number of Data Base Types

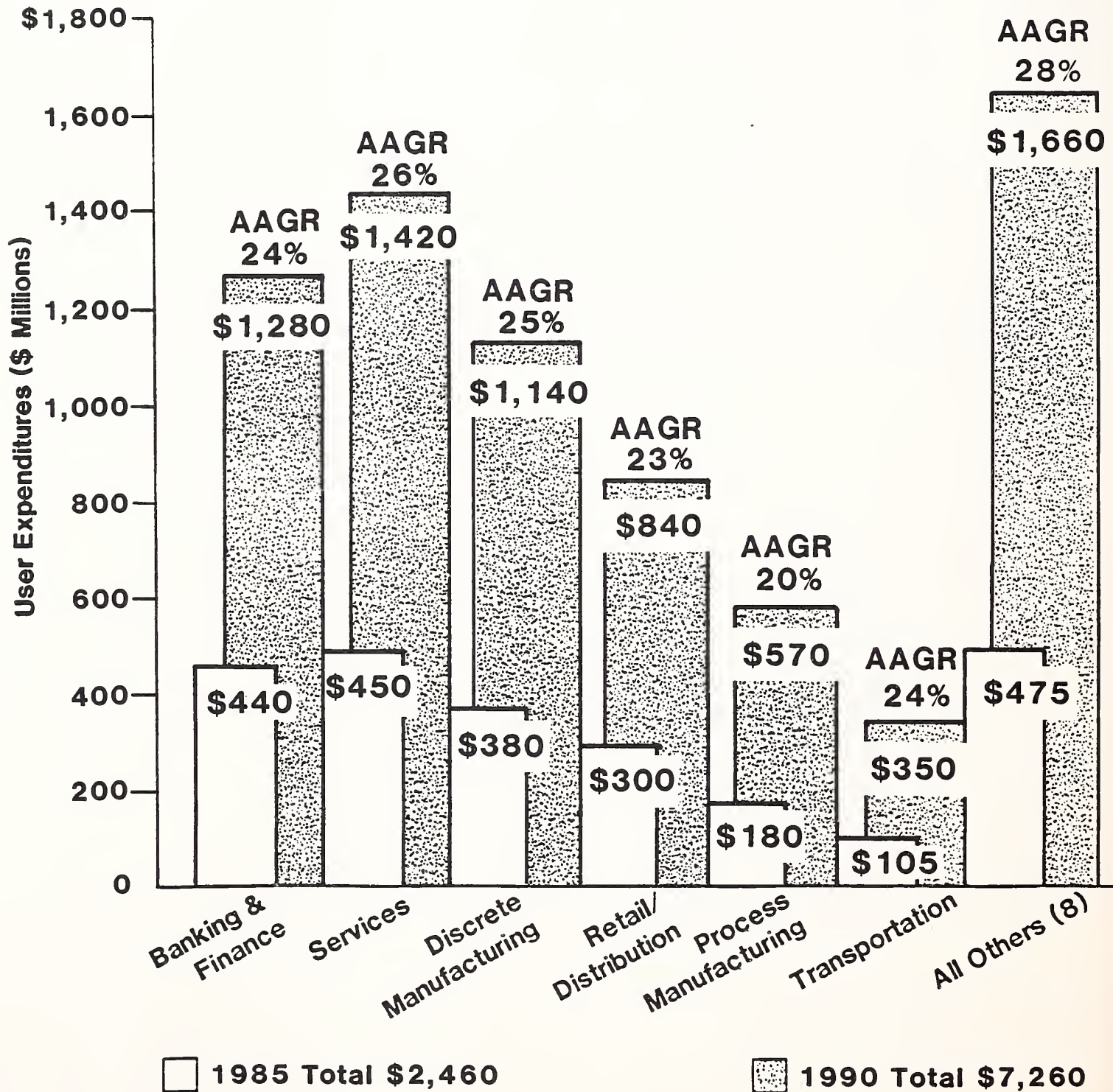
- User expenditures for the bibliographic/text group, including bibliographic, legal, and accounting data bases (which are becoming increasingly full text), will nearly triple by 1990. Growth in the number of data base offerings (by over 75% annually) is reflected in revenue growth of vendors (such as MDC and Westlaw) that exceeds 30% annually.
- Eight specialized data bases in the "other" group (including marketing, real estate, medical, and international and representing over a quarter of current expenditures) are indicative of the diverse nature of the on-line data base information services market.
- Market saturation is now occurring for some data base types; i.e., bibliographic, econometric, and demographic.

D. SERVICES OVERTAKE BANKING AND FINANCE AS LARGEST INDUSTRY SECTOR

- The trend is toward industry-specific offerings which are tied to vertical market solutions.
- The banking and finance sector, traditionally the largest use of on-line data base information services, is already being replaced by the services sector in 1985, which will increase that lead during the forecast period, as seen in Exhibit II-4. The findings are consistent with the shift from a product to a services-dominated U.S. economy. The U.S. is also now an information society; full text services are now offered. Services include:
 - Legal data base services to lawyers, growing at 25%.
 - Medical data base services to physicians and health care professionals.

SERVICES TO OVERTAKE BANKING AND FINANCE AS LARGEST INDUSTRY SECTOR

Forecast of On-line Data Base Information Services Markets
by Industry Sector
1985-1990



- Marketing/advertising to fast-food chains. Both medical and marketing services are now in demand.
 - Credit services to proprietors.
 - News services to analysts and reporters, growing at 32%.
 - Real estate services to brokers.
- The banking and financing sector, with 18% of current expenditures used for vendor-provided information services, will remain an important target.
 - The manufacturing sectors (discrete and process) utilize another 23% of use expenditures.
 - Two other sectors, retail/distribution and transportation, plus the four sectors indicated above, represent over three-quarters of the total market.
 - User-friendly solutions and better access and search software are fueling the market.

E. PAY ATTENTION TO PRODUCTS

- Utilize information contained in existing data bases to spin off marketing, advertising, and services in other areas. The areas selected should be complementary to other market segments and/or fully supportable by the needed company resources.
- Recognize the reality of personal computers by segmenting data bases to accommodate downloading. By adjusting pricing to recognize this need, overall revenue levels can be maintained or improved.

- Develop or acquire gateway software allowing access via personal computers to a wide variety of data bases in a user friendly manner.
- Sponsor development of knowledge-based systems tied to on-line data bases in specific market niches. The user's ability to manipulate data easily has been shown to influence data base use.
- These recommendations are outlined in Exhibit II-5.

F. MARKET OPPORTUNITIES WARRANT SPECIAL ATTENTION

- INPUT recommends that all vendor types give special attention to on-line data base market opportunities (see Exhibit II-6). Every information service vendor should be in this marketplace.
- Attach high priority to locating high value-added data bases and related access and analysis software to support the total-capability market approach that will enhance a competitive edge.
- Hire marketing support personnel to complement product offerings. The user expects to have both technical and industry support available. This expectation is increasing as the whole concept of "user friendliness" is mass marketed.
- Develop a strategy to acquire data base vendors and information intermediaries to enhance product offerings.
- Attempt sole-source licensing arrangements with data base vendors to enhance product offerings and differentiate products from competitors'.
- User-developed data bases make ideal information services offerings.

PAY ATTENTION TO PRODUCTS

Product Recommendations

- **Spin off Services in Other Areas**
- **Accommodate Downloading**
- **Develop User Friendly Gateway Software**
- **Develop Knowledge-based Systems in Selected Areas**

MARKET OPPORTUNITIES WARRANT SPECIAL ATTENTION

Marketing Recommendations

- **Target Effort to Locate High-Value-Added Data Bases**
- **Hire Industry-Specific Marketing Personnel**
- **Acquire Data Base Vendor and Intermediaries**
- **Look for Sole-Source Data Base Offerings**
- **Look For User-Developed Data Bases**

000006

III MARKET ANALYSIS AND FORECAST

III MARKET ANALYSIS AND FORECAST

- Data is gathered into data bases when:
 - The quantity of data is large and expensive to collect.
 - The data requires frequent and expert updating.
 - The data is unique.
 - No satisfactory alternative is available.
- Data base opportunities for outside data exist through:
 - Gathering the data directly through market research firms and consultants.
 - Finding the data available in printed form from publishers.
 - Magnetic tape from data base vendors.
 - On-line access from information services vendors.
- The market analysis and forecast that follow cover the market for data base services:

- Delivered on-line through information services vendors.
- Available for purchase (lease) from data base vendors either directly or on-line through value-added network vendors.

A. MARKET STRUCTURE

I. MARKET PARTICIPANTS

- The market for on-line data base services includes five participants. Their interrelationship is shown in Exhibit III-1.

a. Data Base Vendors

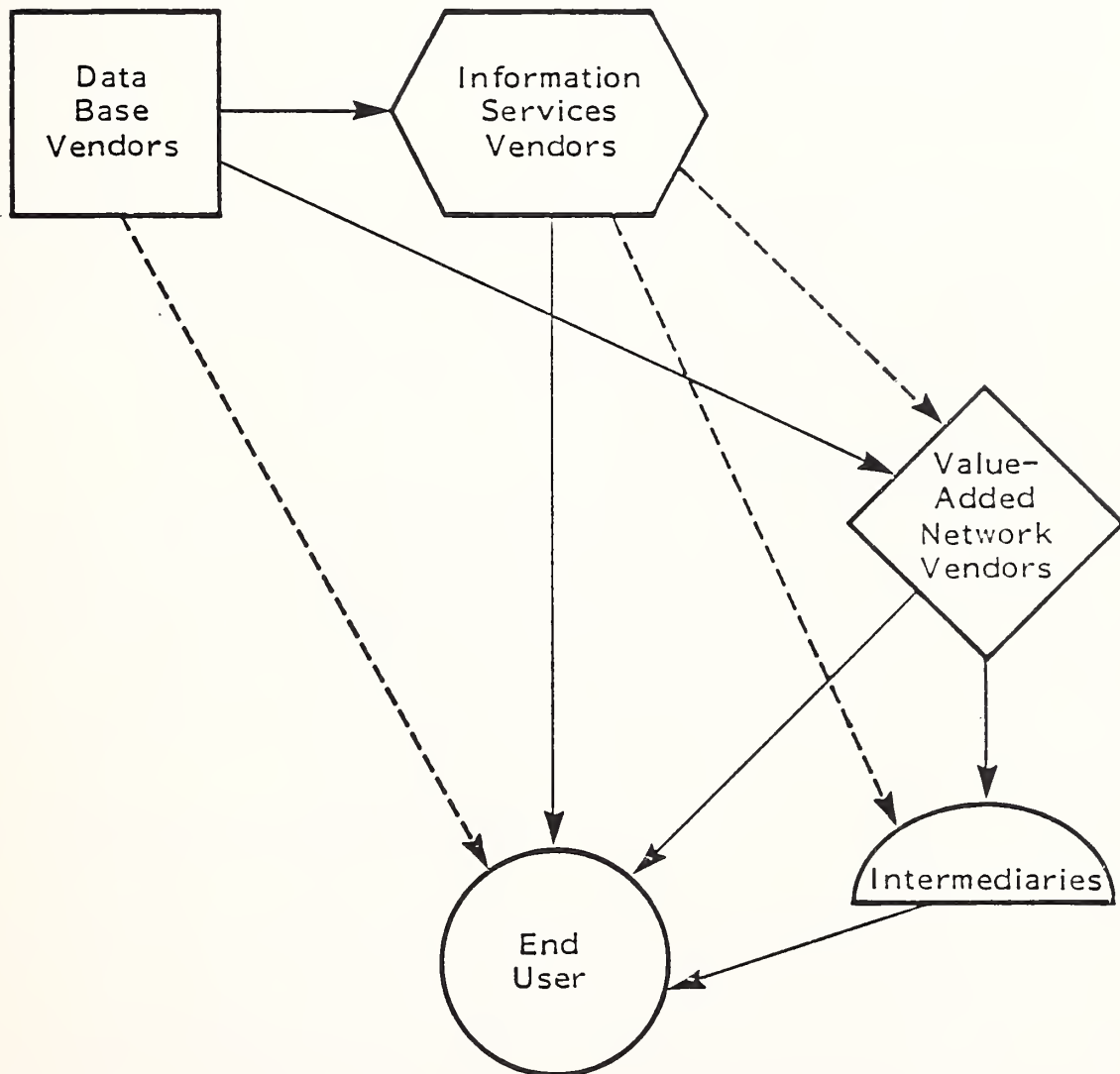
- Data base vendors such as Selling Areas Marketing Information (SAMI) create and maintain data bases usually as a by-product of a report, service, or publication. The data bases are created using original key entry, frequently in conjunction with electronic publishing and more recently as a result of office automation. Data base vendors more frequently offer data bases through information services vendors such as General Electric Information Services (GEISCO). However, data base vendors may also offer data base services directly on magnetic tape, through their own private data networks, or through the data networks of distribution vendors.

b. Information Services Vendors

- Information services vendors offer data base services either through their own telecommunication networks (such as Chase/IDC) or through value-added network vendors (as in the case of Lockheed's Dialog).

EXHIBIT III-1

ON-LINE DATA BASE SERVICES MARKET PARTICIPANTS



—————> Primary Distribution Channel
-----> Alternate Distribution Channel

- Information services vendors, for example Telmar Media Group, offer value-added services using data base vendor products or, as in the case of CISI, integrate data base creation and maintenance with remote information services.

c. Value-Added Network Vendors

- Value-added network vendors, such as Tymnet, Telenet, and Uninet, enable both data base and information services vendors to offer on-line data base services to a large number (greater than 25,000) of widely dispersed intermediaries and end users.
- Information services vendors, such as ADP (Autonet) and GEISCO (Marknet), are offering value-added network services as an alternate means of distribution for data base vendors. AT&T and IBM are also becoming primary distribution channels for data base information services.

d. Intermediaries

- Intermediaries, such as corporate librarians and commercial search services, use data base services to search and gather information for end users.
- Factors related to participation of intermediaries in the market are:
 - End users still find many on-line data base systems difficult to use.
 - Intermediaries are trained in search techniques and are familiar with multiple systems.
 - Personal computers with micro search capability will, over time, reduce end-user dependence on intermediaries.

- Intermediaries are considered as end users in the formulation of user expenditures in this study.

e. End Users

- An increasingly wide variety of end users directly access on-line data bases using intelligent terminals (CRT and hard copy) or specialized terminals such as those used for Telerate or Westlaw.
- Typical end users for on-line data base services are shown in Exhibit III-2.

2. MARKET DEFINITION

- The size and complexity of the on-line data base information services marketplace is best approached through market segmentation.
 - There were over 1,650 data bases offered in the U.S. in 1984.
 - The data bases cover a wide diversity of subject matter, disciplines, and information content.
 - Services are offered on both an industry-specific and a cross-industry basis.
- INPUT decided on the group and sector segmentation shown in Exhibit III-3 to determine market size and growth.
- The group segmentation matches that shown in INPUT's Annual Report for the U.S. Information Services Market, 1983-1988 (see Appendix B).
- Securities and commodities data bases, real-time and historical, are associated with daily market operations of the major national and commodity exchanges.

EXHIBIT III-2

TYPICAL END USERS OF ON-LINE DATA BASE SERVICES

END USERS	APPLICATION	DATA BASE	INFORMATION SERVICES VENDOR	VALUE-ADDED NETWORK VENDOR
Securities Broker	Stock Trading	Quotron	Quotron	-
Lobbyist	Support Bill Passage	Legislative Information	Public Affairs Information, Inc.	Telenet
Business Economist	Company Performance Analysis	Disclosure	Dow Jones, Inc.	Tymnet
Claims Analyst	Automobile Repair Estimation	Automobile Collision Data Base	ADP Collision Estimating Service	-
Law Clerk	Case Analysis	LEXIS	MEAD, Inc.	-
Research Pharmacologist	Drug Introduction	Drug Distribution Information	IMS America, Ltd.	Telenet
Funds Manager	Current FED Funds Rate, Interest Rates	Money Markets	Telerate, Inc.	-
Media Planner	Advertising Planning	Arbitron T.V.	Telmar Media Corp.	Telenet
Petroleum Engineer	Production Planner	Petroleum Well Info.	Petroleum Information Corporation	Tymnet
Credit Grantor	Personal Credit	Credit	TRW Credit Services	-

- Financial and economic data bases, associated primarily with the micro-economic and financial activity of businesses (both industrial and financial), support corporate, market, financial, and strategic planners and contain time series of primarily historical data.
- Industry data bases contain information and numeric data for industries such as the automotive and agriculture industries, which have been separately segmented to highlight their importance.
- Credit data bases include information on both consumers and corporations.
- Bibliographic data bases are primarily automated library research and reference citation information and (in selected instances) full text.
- Legal and accounting data bases include citation and full text of legal, accounting, and legislative information.
- News data bases contain information from newsletters, newspapers, and magazines, primarily of current events. To the extent that selected news data bases could be separately identified, they were included in the financial, economic, and securities and commodities subsectors.
- Marketing data bases contain information used for sales, distribution, and advertising of products and services.
- Resources data bases contain information on natural resources such as oil, coal, gas, and uranium.
- International data bases, otherwise classifiable under types such as econometric, financial and economic, or resources, were separated in order to highlight the number and diversity available to U.S. companies through U.S. information services vendors.

- Econometric data bases, associated primarily with aggregate economic forecasting, contain time series of historical and forecast data.
- Data bases that were not classified in the 14 selected subsector types are included in the "other" subsector.

B. MARKET FORECASTS

I. METHODOLOGY

- The study forecasts user expenditures for on-line data base services. Those services consist of:
 - Data base lease and royalty fees paid to data base vendors.
 - Expenditures for data base access and related computation paid to information services vendors.
 - Expenditures for telecommunications services offered by value-added network vendors.
- The forecasts include primarily end-user expenditures by corporate entities such as industrial companies and financial institutions.
- User expenditures by governments are forecasted, but not included are end-user expenditures for data base subscriptions and other data base services offered by government agencies such as the Library of Medicine and the National Technical Information Service.

- Expenditures by some individuals (such as investors as end users) are included, but expenditures for "the consumer sector" are not.
- The forecast is limited to U.S. user expenditures. Expenditures for data base services by foreign entities that are reported as part of U.S. vendors' gross revenues have been excluded.
- Where data base vendors such as Predicasts, Inc. offer data bases on subscription (royalty) through information services vendors, expenditures for subscription services are separately forecast. Every attempt was made to avoid "double counting." An attempt was made to separate end-user expenditures for data base subscriptions (data bases created and maintained by information services vendors such as Mead or DRI) from end-user expenditures for access and related computing services.
- Data base vendors such as Petroleum Information Corporation, offering on-line data base services either directly or through value-added network vendors, were classified as information services vendors.
- End-user expenditures for on-line data base telecommunications services were limited to value-added network vendors including Tymnet and Telenet. User expenditures for information services vendor network services are included as part of total end-user expenditures for information services vendors' data base services.
- Each of the 15 data base sectors listed in Exhibit III-3 were separately forecasted (see Chapter IV - Market Analysis by Data Base Sector).
 - The six industry sectors with highest total 1984 end-user expenditures were retained for additional analysis. End-user expenditures for the remaining eight were included in total end-user expenditures for the "other" sector.

EXHIBIT III-3

MARKET SEGMENTATION OF
ON-LINE DATA BASE SERVICES BY GROUP AND SECTOR

GROUP	SECTOR
Securities/Financial	Securities and Commodities Financial/Economic Industry
Credit	Credit
Text/Bibliographic	Bibliographic Legal/Accounting
News	News
Other	Marketing Medical International Demographic Resources Real Estate Econometric Other
5	15

- The data base sectors were summarized by both vendor type and industry sector.

2. FORECAST OF USER EXPENDITURES

- A general sense of the dynamic growth of the on-line data base services marketplace can be gained from a review of the data, as shown in Exhibit III-4. In just three years:
 - The number of vendors producing data bases has more than tripled.
 - Nearly 650 information services vendors offer on-line data base services either directly or through value-added network vendors.
 - The number of individual data bases has more than quadrupled.
- Growth in the number of the fulltext news data bases has, as shown in Exhibit III-5, been truly explosive. Five other data base types had growth exceeding 50% annually.
- The market for on-line data base services is by all measures outstanding. Users spent, as shown in Exhibit III-6, in excess of \$2.5 billion for on-line data base information services in 1984.
 - Over 75% went to information services vendors primarily for on-line processing services.
 - Over 65% of total expenditures had industry-specific application.
 - Security/financial, largest of the five data base groups, captured more than 28% of total expenditures allocated to information services vendors.

EXHIBIT III-4

GROWTH IN THE U.S. ON-LINE
DATA BASE SERVICES MARKETPLACE
1981-1984

ITEM	NUMBER OF		AAGR (Percent)
	1981	1984	
Data Base Vendors	62	200	34%
Information Services Vendors	176	640	38
Data Bases	368	1,650	46%

EXHIBIT III-5

GROWTH IN THE NUMBER OF U.S. DATA BASE OFFERINGS BY SECTOR
1981-1984

DATA BASE GROUP	DATA BASE SECTOR	NUMBER		AAGR (Percent)
		1981	1984	
Securities/ Financial	Securities and Commodities	19	106	54%
	Financial/Economic	29	115	40
	Industry	26	92	40
	Sub-Total	74	313	43%
Credit	Credit	4	14	37%
Text/ Bibliographic	Bibliographic	110	236	21
	Legal/Accounting	14	122	72
	Sub-Total	124	358	30%
News	News	9	280	136%
Other	Marketing	16	71	45
	Medical	15	98	60
	International	33	210	59
	Demographic	8	27	35
	Resources	14	92	60
	Real Estate	6	27	45
	Econometric	33	68	20
	Other	32	97	32
	Sub-Total	157	690	45%
	Total	368	1,655	46%

EXHIBIT III-6

DISTRIBUTION OF USER EXPENDITURES FOR
ON-LINE DATA BASE SERVICES BY SERVICE TYPE IN 1984

SERVICE TYPE	USER EXPENDITURES (\$ Millions)		
	CROSS- INDUSTRY	INDUSTRY SPECIFIC	TOTAL
Data Base Vendors	\$95	\$395	\$490
Information Services Vendors			
● Securities/Financial			
- Securities/Commodities	48	240	288
- Financial/Economic	58	144	202
- Industry	7	63	70
Securities/Financial Subtotal	113	447	560
● Credit			
- Credit	230	230	460
● Text/Bibliographic			
- Bibliographic	67	38	105
- Legal/Accounting/Legislative	22	103	125
Text/Bibliographic Subtotal	89	141	230
● News			
- News	88	132	220
● Other			
- Marketing	28	37	65
- Medical	11	14	25
- International	10	16	26
- Demographic	39	6	45
- Resources	8	31	39
- Real Estate	8	80	88
- Econometric	31	50	81
- Other	20	131	151
Other Subtotal	155	365	520
Information Services Vendors Subtotal	675	1,315	1,990
Value-Added Network Vendors	25	60	85
Total	\$795	\$1,770	\$2,565

- End-user expenditures for all services, already exceeding \$2.5 billion in 1984, will grow, as shown in Exhibit III-7, to nearly \$9.5 billion annually by 1990, a 24% annual growth rate over the forecast period.
 - Growth will be largest for value-added network vendors as data base vendors continue to shift from royalty arrangements with information services vendors to offering on-line data base information services through value-added network vendors.
 - The current widespread availability of VANs, such as Dow Jones Information Company, Dun & Bradstreet, and McGraw-Hill, are also a factor in this growth.
 - Further, the downloading of data to intelligent terminals and the use of personal computer software are accelerating this trend.
 - Greater growth in the industry-specific component results from the industry trend to differentiate service offerings through focused market selection, and increased specialization in vertical markets.
 - Industry-specific data base services also are being offered by entrepreneurs who find them an easy entry into the market.
 - Vendors licensing their services to entrepreneurs will cause a broadening of the market and an additional distribution channel will be thereby created.
- User expenditures for on-line data base services by information services vendors in 1984 approached 25% of total expenditures for remote processing services, as forecast in INPUT's Market Analysis and Planning Service (MAPS) 1983-1988 Annual Report on the U.S. information services markets (see Appendix B).

EXHIBIT III-7

FORECAST OF USER EXPENDITURES FOR
ON-LINE DATA BASE SERVICES BY SERVICE TYPE
1985-1990

SERVICE TYPE	USER EXPENDITURES (\$ Millions)			AAGR 1985/1990 (Percent)
	1984	1985	1990	
Data Base Vendors				
Cross-Industry	\$ 95	\$ 110	\$ 220	\$ 15%
Industry-Specific	395	490	1,500	25
Subtotal	\$ 490	\$ 600	\$1,720	\$ 23%
Information Services Vendors				
Cross-Industry	675	810	2,020	20
Industry-Specific	1,315	1,650	5,240	26
Subtotal	\$1,990	\$2,460	\$7,260	\$ 24%
Value-Added Network Vendors				
Cross-Industry	25	30	80	22
Industry-Specific	60	80	360	35
Subtotal	\$ 85	\$ 110	\$ 440	\$ 32%
Cross-Industry	795	950	2,320	20
Industry-Specific	1,770	2,220	7,100	26
Total	\$2,565	\$3,170	\$9,420	\$ 24%

- The rapid change in delivery of on-line data base information services is highlighted in Exhibit III-8. Microprocessor-driven software products and integrated systems (which are in combination about 10% of total 1984 expenditures) will approach 20% in 1990. Downloading and local search and analysis will become widespread. Explosive growth in the number of news data base offerings will pace the news data base group, as shown in Exhibit III-9, to greatest annual growth.
 - Industry-specific data bases will pace the securities/financial group.
 - In an expanding economy, marketing data base services will experience accelerated growth.
 - Accelerated growth in resources data base services is related to the shift of large petroleum data bases to an on-line environment.
 - Travel/leisure data base services will pace growth in the "other" subsector.
- On-line data base services are, as shown in Exhibit III-10, used in all 14 industry sectors served by information services vendors.
 - The services sector is expected to be the greatest user of on-line data base information services by 1990, closely followed by the banking and finance and the discrete manufacturing sectors.
 - These three sectors will account for over 50% of total user expenditures for on-line data base information services in 1990.
- Additional information concerning on-line data base services supporting each industry sector is found in Chapter IV - Market Analysis by Data Base Sector.

EXHIBIT III-8

FORECAST OF USER EXPENDITURES FOR
ON-LINE DATA BASE INFORMATION SERVICES BY MODE OF DELIVERY
1985-1990

DELIVERY MODE	USER EXPENDITURES (\$ Millions)			AAGR 1985/1990 (Percent)
	1984	1985	1990	
Remote Processing	\$1,790	\$2,185	\$5,860	22%
Software Products	70	90	335	30
Integrated Systems	130	185	1,065	42
Total	\$1,990	\$2,460	\$7,260	24%

EXHIBIT III-9

FORECAST OF USER EXPENDITURES FOR ON-LINE DATA BASE
INFORMATION SERVICES BY DATA BASE TYPE

1985-1990

DATA BASE GROUP	DATA BASE TYPE	USER RCS EXPENDITURES (\$ Millions)			AAGR 1985/1990 (Percent)
		1984	1985	1990	
Securities / Financial	Securities and Commodities	\$288	\$360	\$1,190	27%
	Financial/Economic	202	255	810	26
	Industry	70	90	280	27
	Subtotal	\$560	\$705	\$2,280	26%
Credit	Credit	460	525	1,010	14%
Text / Bibliographic	Bibliographic	105	123	260	16
	Legal/Accounting	125	157	480	25
	Subtotal	\$230	\$280	\$ 740	21%
News	News	220	290	1,160	32
Other	Marketing	65	85	290	35
	Medical	25	35	190	40
	International	26	34	135	32
	Demographic	45	55	175	26
	Resources	39	50	200	28
	Real Estate	88	110	365	27
	Econometric	81	96	230	19
	Other	151	195	485	20
	Subtotal	\$520	\$660	\$2,070	26%
Total	Total	\$1,990	\$2,460	\$7,260	24%

EXHIBIT III-10

FORECAST OF USER EXPENDITURES FOR
ON-LINE DATA BASE INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER RCS EXPENDITURES (\$ Millions)			AAGR 1985/1990 (Percent)
	1984	1985	1990	
Banking and Finance	\$ 360	\$ 440	\$1,280	24%
Services	356	450	1,420	26
Discrete Manufacturing	309	380	1,140	25
Retail/Distribution	242	300	840	23
Process Manufacturing	143	180	570	26
Transportation	110	130	350	22
Wholesale	81	105	310	24
Insurance	69	85	220	21
Federal Government	73	85	190	18
Medical	30	42	220	39
Education	41	48	100	16
Utilities	22	30	110	30
State/Local Government	16	20	50	20
Other	138	165	460	23
Total	\$1,990	\$2,460	\$7,260	24%

C. INFLUENCING FACTORS

I. TECHNOLOGY

- The continued decline in storage costs strongly favors the economies of on-line data base services (including fulltext) over that of more labor- and energy-intensive delivery systems such as printed publications. Disk storage costs announced by IBM, as shown in Exhibit III-11, reflect an average decrease in mass storage costs exceeding 30% annually for the 16-year period of 1964-1980.
- Video disk technology promises even greater data storage economy. Both mainframe and micro-driven systems will be available to hold both fulltext and image information for both corporate and consumer applications. However, there are no PC products yet. Sony/Phillips is currently the standard offering. Projected video disk storage costs, assessed in INPUT's report Impact of Upcoming Optical Memory Systems, are also shown in Exhibit III-11.
- Optical disks also hold much promise for read-only memories and other applications in data storage. Vendors are already entering these new niche markets, as shown in Exhibit III-12.
- The personal computer is rapidly changing the structure of the on-line data base services marketplace. Based on information gathered in INPUT's report Personal Computers in the U.S. Strategy (see Appendix B), sales of personal computers to the home and office markets (over 2.5 million units in 1983) will, as shown in Exhibit III-13, exceed 14 million units annually by 1990, of which four million will be in an office environment. Even though consolidation is occurring, types of PCs continue to proliferate.

EXHIBIT III-11

COST COMPARISON - OPTICAL MEMORIES VERSUS MAGNETIC DISK

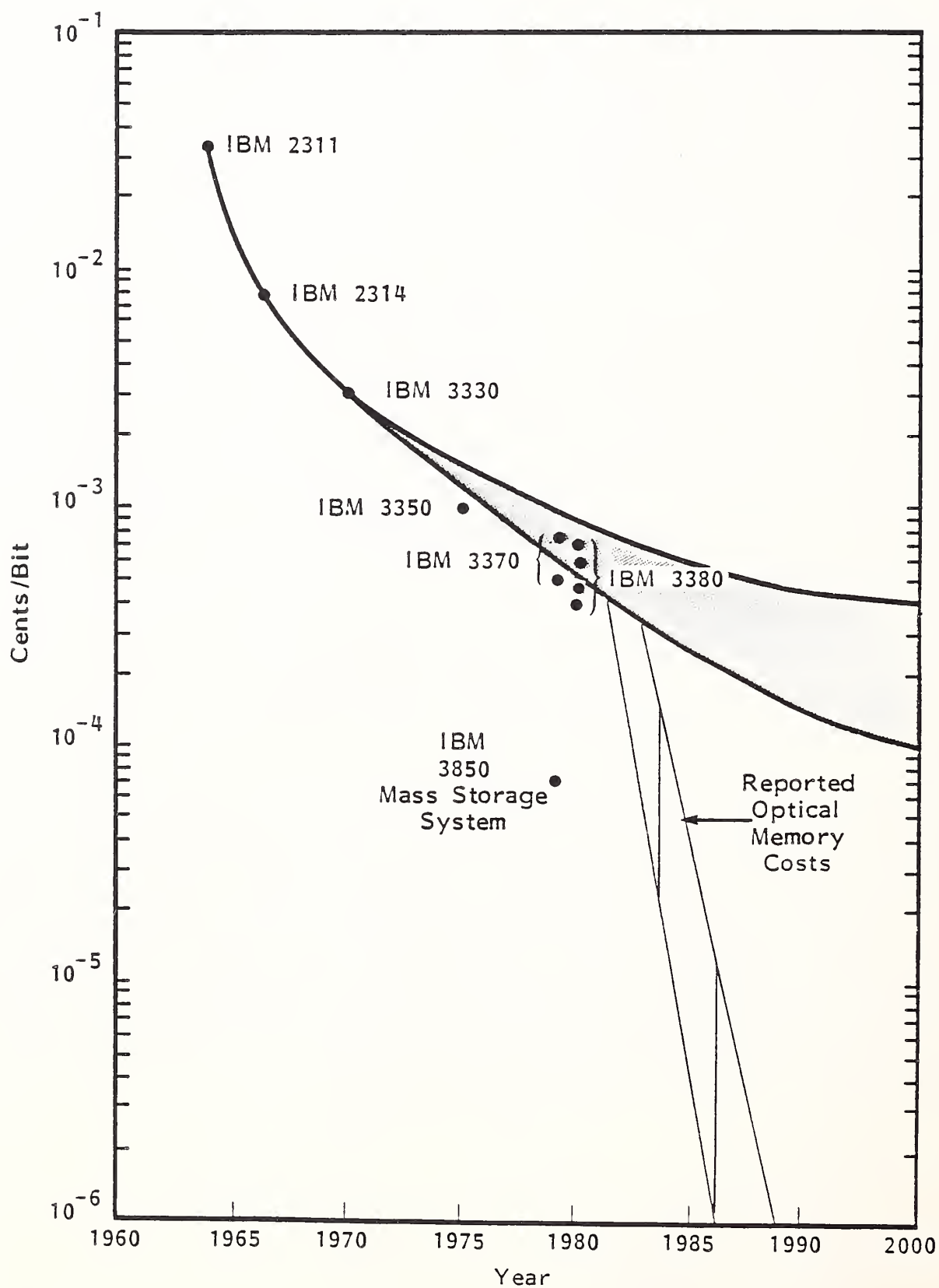


EXHIBIT III-12

TECHNOLOGY TRENDS OPTICAL DISKS

- CD-ROM
 - Drives from Phillips, Sony, Hitachi, and Panasonic
 - Media Recorded by 3M, Laser Video, Phillips
 - Turnkey Systems by Laser Data and Reference Technology
 - DEC Microvax
 - IBM PC Drives
- O ROM
 - Faster than CD-ROM
 - One-Half the Capacity
 - No Vendors Yet
- Optical Cards
 - Drexler Technology Corp.
 - Blue Cross of Maryland Patient Records

EXHIBIT III-13

FORECAST OF PERSONAL COMPUTER SALES TO
HOME AND OFFICE MARKETS BY UNITS
1985-1990

MARKET	SALES (Thousands)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Office	1,090	1,340	4,090	25%
Home	2,260	2,980	10,240	28
Total	3,350	4,320	14,330	27%

- In the office and industrial markets, personal computers are appearing as intelligent workstations. As such, they will offer access to the corporate data base. Important trends in the market include micro-to-mainframe communications, more distributed processing, and local area networks. Nearly all vendors offer IBM compatibility. Although the office automation market is consolidating, overall activity is expected to increase in the near term.
- The home market for personal computers appears stalled due to consumers' failure to perceive them as solutions to their problems. Vendor advertising has not conveyed this concept to buyers, and retailers have been equally ineffective in educating the public about computer use. Currently, most home computers are used primarily for entertainment. But as user friendly applications become available and the cost declines, the market will renew momentum. Buyers will increasingly put their personal computers to effective use in investment and tax planning, education, word processing, and record-keeping. PCs will also play an important role in the future video text market described in Chapter V.
- An increasing number of personal computers will, as shown in Exhibit III-14, have the capability of accessing, downloading, and analyzing on-line data bases.
 - By 1990, nearly 76%, or over three million units, will have this capability in the office environment.
 - In 1985, over one and one-half million PC end users are potential candidates for on-line data base services in the home and office.
- Development of microprocessor-driven gateway software will allow end users to access a wide variety of data base and information services vendors from a personal computer in a user-friendly manner.

EXHIBIT III-14

FORECAST OF MODEM SALES TO HOME AND
OFFICE PERSONAL COMPUTER MARKETS BY UNITS
1985-1990

MARKET	SALES (Thousands)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Office	460	620	3,100	38%
Home	1,240	1,700	6,310	30
Total	1,700	2,320	9,410	32%

- Development of knowledge-based systems will allow end users to automatically access and search relevant on-line data bases as part of the formulation process.

2. COMPETITION

- Newspaper, publishing, and communication companies are looking at consumer markets that could well exceed \$10 billion by the late 1980s and as a result are expanding in the marketplace for on-line data base services.
 - Dow Jones, accelerating its Dow Jones News/Retrieval Services in the consumer marketplace, has in excess of 260,000 subscribers. Recent subscriber totals for other on-line data base services are given in Exhibit III-15.
 - IBM, CBS, and Sears are implementing a joint venture to bring video information services to consumer markets.
 - Bank of America and Chemical Bank are but two of many money center banks offering consumer information services, including personal banking.
 - Knight Ridder and Times Mirror are but two of many newspaper chains involved in testing delivery of on-line information services to consumers.
- Vertical market integration continues to take place as major publishing houses, including Dun & Bradstreet and McGraw-Hill, continue to acquire on-line information services capabilities.
- With divestiture nearly complete, AT&T is expected to become a major factor in the on-line delivery of information to both the corporate and consumer

EXHIBIT III-15

ON THE MOVE

On-Line Data Base Services Subscribers

. Dow Jones Information Services	- 260,000
. Mead Data Central	- 260,000
. CompuServ	- 200,000
. Dialog	- 90,000
. Quotron	- 70,000
. The Source	- 70,000
. Dialcom	- 50,000
. Reuters	- 45,000
. Equifax	- 40,000
. ADP	- 35,000
. Telerate	- 30,000
. BRS	- 28,000
. Chilton	- 15,000
. Others (20)	- 97,000
Total	<hr/> 1,290,000

marketplaces. An early offering will be AT&T Real Estate Information Services, an on-line data base of homes, mortgage availability, comparative home prices, and local community services in New Jersey.

- Electronic mail services are evolving as another distribution mechanism for the delivery of on-line information services.
 - ITT Dialcom is rapidly adding on-line data base offerings for its 100,000+ users.
 - Tymshare and ADP are just two of the vendors that are expanding electronic mail delivery offerings to include on-line data base service offerings.
 - It is likely that AT&T will take the electronic message service route in delivering additional services, including on-line information data bases.
- Market consolidation is increasing as McGraw-Hill, Dun & Bradstreet, Mead Data Central, Dialog, and SDS Search provide examples in making complementary acquisitions or targeting new markets.

IV MARKET ANALYSIS BY DATA BASE SECTOR

IV MARKET ANALYSIS BY DATA BASE SECTOR

A. SECURITIES/FINANCIAL GROUP

- Data bases related to end users involved in the stock and commodity markets, in money markets, and in corporate financial operations have been grouped into the securities/financial group.

I. SECURITIES AND COMMODITIES

a. Types

- Securities and commodities data bases, real-time in nature, are associated with securities, commodities, and money market trading. Whereas some of the data contained in the data bases may be historical, the major part of the added value is in the timeliness of the data. The majority of the data results from trading information coming from the various stock and commodity exchanges and money market operations.
- The data base services offered are of an inquiry nature. Buy and sell orders can be initiated by more recent offerings.

- Three types of data bases exist:
 - Data bases associated with primary securities and commodities exchanges.
 - Data bases associated with secondary markets.
 - Data bases associated with the over-the-counter market.

b. Market Forecast

- With over 100,000 installed terminals in a still-expanding market, securities and commodities data base services (just over \$325 million in 1984) will, as shown in Exhibit IV-1, approach \$1,300 million by 1990, for a 26% annual growth rate over the forecast period.
- Expanded offerings of options and futures and financial office automation related to securities and commodities data base operations will foster information services vendor growth during the forecast period.
 - The current ratio of 1.6 brokers per terminal will continue to decrease, and will approach 1.0.
 - Microprocessor technology will greatly increase functionality at the office level.
- As shown in Exhibit IV-2, the banking and finance sector is the major (67%) market area.
 - Eighty percent of total banking and finance expenditures are from brokerage houses.
 - Twenty percent are from banks and institutional investors.

EXHIBIT IV-1

FORECAST OF USER EXPENDITURES FOR
SECURITIES AND COMMODITIES
ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 38	\$ 44	\$ 80	13%
Information Services Vendors	288	360	1,190	27
Value-Added Network Vendors	-	-	-	-
Total	\$326	\$404	\$1,270	26%

EXHIBIT IV-2

FORECAST OF USER EXPENDITURES FOR
SECURITIES AND COMMODITIES ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Banking and Finance	\$192	\$235	\$ 695	24%
Discrete Manufacturing	12	25	85	28
Process Manufacturing	13	17	55	27
Services	12	18	75	34
Insurance	14	18	65	29
All Others	37	47	115	20
Total	\$280	\$360	\$1,090	25%

- Securities and commodities data base services are also used by fund managers and financial officers in Fortune 1000 companies across most industry sectors.

c. Key Data Bases and Vendor Services

- ADP has selected the brokerage business as a major target for expansion.
 - It has acquired the financial inquiry business from GTEIS.
 - ADP has acquired Comtrend, Inc., a leader in the options and futures trading market services.
 - ADP is developing an integrated brokerage office automation system utilizing Monchik-Weber software and Convergent Technologies processors.
- Monchik-Weber is extending its options and futures data base services from sell-side services to over 400 traders and brokers (to buy-side investment and financial managers).
- Quotron Systems, the leading vendor with over 50% of the current market, is with its latest offering, Quotron 1000, expanding its data base services to include financial computational capabilities for portfolio evaluation, analysis, options, hedging, and financial office automation services.
- Fidelity Brokerage, a leading discount broker, has offered quotation and buy and sell on-line data base services to the individual investor utilizing personal computers. The service, "Fidelity Investor's Express," allows users to obtain current prices for all major exchanges and NASDAQ, place buy and sell orders, and do analysis using micro software packages such as VisiCalc and Lotus 1-2-3.

- Signaling its expansion into the delivery of information services, IBM, in a joint venture with Merrill Lynch, will deliver stock quotations, financial and market data bases, data processing, and computing capability to brokerage houses and individuals with IBM and other personal computers. The service will use Monchik-Weber software and wideband telecommunications including satellite, microwave, and teletext.

2. FINANCIAL AND ECONOMIC

a. Types

- Financial and economic data bases can contain historical numeric data. The data may be aggregate economic information about financial and real markets (e.g., production sales) or data about individual companies or financial instruments (e.g., stocks, bonds). Financial and economic data bases differ from the securities and commodities data bases discussed in Chapter I in that the data is not maintained in real (or near-real) time.
- Financial and economic data bases differ from econometric data bases in that they do not contain forecasted data. Some overlap exists between financial and economic data bases and some econometric data bases containing historical data.
- Financial and economic data bases fall into five types:
 - Financial market data bases contain money market information such as interest rates on treasury bills or commercial paper.
 - Financial institutions' data bases contain financial and economic data bases about banks, savings and loans, and other financial institutions.
 - Stock and bond data bases contain historical, financial, and economic data on stocks and bonds.

- Commodities data bases contain historical, financial, and economic data on commodities such as agricultural products, metals, oil, currency, futures, and mortgage instruments.
- Corporation data bases contain financial data about corporations and economic data about industry groups.

b. Market Forecast

- The market for economic data base services is, as shown in Exhibit IV-3, excellent for both data base and information services vendors. With the number of data bases growing over 40% annually, expenditure growth for data base subscription services is expected to exceed expenditures for access and related computation.
- Favorable market growth is due to the following factors:
 - The accelerated growth of personal computers in corporations has greatly expanded the user base.
 - Uncertainty in financial and industrial markets has forced corporations to increase their emphasis on financial and corporate planning.
- Financial and economic data base services are widely used by all industry sectors. The five primary sectors shown in Exhibit IV-4 encompass nearly 70% of total 1984 expenditures to information services vendors.

c. Key Data Bases and Vendor Services

- The study identified nearly 90 financial and economic data base offerings. See Chapter V for additional examples.

EXHIBIT IV-3

FORECAST OF USER EXPENDITURES FOR
FINANCIAL/ECONOMIC ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 38	\$ 49	\$170	28%
Information Services Vendors	202	255	810	26
Value-Added Network Vendors	-	-	-	-
Total	\$201	\$304	\$980	26%

EXHIBIT IV-4

FORECAST OF USER EXPENDITURES FOR
FINANCIAL/ECONOMIC ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Banking and Finance	\$ 41	\$ 50	\$160	25%
Discrete Manufacturing	34	46	170	30
Transporation	24	30	105	28
Insurance	21	28	115	32
Wholesale	18	22	80	29
All Others	63	79	180	18
Total	\$201	\$255	\$810	26%

- Financial markets:

- Telstat Systems, Inc. maintains Teleprice/80, covering over 30,000 securities for the major stock exchanges, and the over-the counter and options markets. Telstat also maintains a municipal bonds data base containing past pricing history on over one million municipal bonds. Telstat supplies data bases to some 20 information services vendors and offers on-line services through its TELAC offerings.
- Citicorp maintains Citibase, a data base containing more than 5,000 time series, including foreign exchange rates, money supply, interest rates, and other key financial items from NBER, the Federal Reserve, and other agencies. Citicorp also produces Citibase Weekly, containing 400 time series primarily on financial markets.

- Financial institutions:

- Cates Consulting Analysts, Inc. specializes in data bases for financial institutions.
 - BanCompare contains financial data on 250 publicly held banks and bank holding companies.
 - Financial Institutions data base contains financial information on 14,500 commercial banks, 4,000 S&Ls, and over 16,500 credit unions.
 - TrustCompare contains analyses of personal trust investment, employee benefits, and other trust-related services for over 200 larger bank trust department operations.
- Government agencies such as the Federal Deposit Insurance Corporation for commercial banks, the Federal Home Loan Bank for S&Ls, and

the National Credit Union Association for credit unions offer data bases covering their respective institutions.

- Stocks and bonds:

- Security Data Company maintains corporate data bases covering all publicly offered debt and equity issues since 1970. The data includes key financial data and selected ratios, market values, price earnings assets, revenues, etc. The company also maintains a data base that it offers on mergers and acquisitions, another on municipal debt, and another on private placements.
- Value Line, Inc. produces a data base containing over 400,000 annual and quarterly time series for approximately 1,700 Fortune 1000/100 companies. The data base is supplied to more than 10 information services vendors, leased directly to corporations, and more recently has become available in segmented form for downloading to personal computers.

- Commodities:

- MJK Associates maintains a data base containing current and historical time series of financial information on all active commodity contracts in 40 major commodity groups traded on the major commodity exchanges.
- Commodity Information Services Company (CISCO) provides historical data for all major commodities on the U.S. exchanges. Information is stored on a daily basis except for the current two weeks, for which trading is tracked in five-minute increments.
- Commodities Systems, Inc. offers a futures financial options data base and service that covers historical time series of price and trading data

for financial instruments traded in major U.S. and international money markets.

- Corporations:

- Standard & Poor's maintains the CompuStat data base of financial information on over 6,000 corporations and institutions listed on the major U.S. and Canadian exchanges and sold over the counter. The data bases are offered through eight information services vendors and directly on a subscription basis to over 400 major corporations.
- Standard & Poor's maintains an industry financial data base containing over 2,000 monthly, quarterly, and annual time series on approximately 100 industry groups. Data includes items such as sales, earnings, taxes, profit, working capital, and dividends.

- ADP Network Services specializes in financial and economic data base services to financial institutions and industrial corporations. These services include:

- BanCompare, using the Cates Consulting Analysts, Inc. data bases.
- Merger/acquisition analysis, using the CompuStat data base.
- Financial analysis, using the Security Data Company corporate data bases.
- BanCall, using the Federal Deposit Insurance Corporation (FDIC) data base on federally insured banks.
- Market analysis and planning, using the Federal Reserve Board (FRB) flow-of-funds data base.

- Chase/IDC specializes in economic and financial data base services in the banking and finance sector:
 - Portfolio pricing and analysis services using its comprehensive security data bases.
 - Investment analysis using the Value Line data base.
 - Hedging analysis using its foreign exchange data bases.

- Control Data Corporation Business Information Services has a significant presence in offering on-line data base services to the financial community:
 - Comparative analysis of banking institutions, utilizing the Robinson-Humphrey data base and analysis software.
 - Option analysis, utilizing the Monchik-Weber options data bases.
 - Investment analysis and portfolio pricing, using the Telstat securities data bases.
 - Merger/acquisition analysis, using the Cates Consulting Analysts, Inc. financial institutions data base.
 - Analysis and money markets, using financial management and policy data bases from Money Markets Services, Inc.
 - Estate planning and portfolio analysis and valuation, using the VALPORT software with the Frederick C. Tower and Company data base.

- Concentrating on financial and economic data base services to the corporate marketplace, GEISCO offers:

- Hedging decision analysis using Market Data Systems commodities futures data base.
 - Money market analysis using currency exchange data bases.
 - Corporate financial planning utilizing the international financial statistics data base produced by the International Monetary Fund (IMF).
 - Competitive analysis of financial institutions utilizing the banking and finance data base produced by Marketing Information Data Systems.
- NDC's Rapidata Division provides data-base-oriented applications services to both financial institutions and corporation officers:
 - Funds planning utilizing the Conference Board economic time series data base.
 - Money market analysis utilizing the Telerate II data base.
 - Portfolio analysis and evaluation using Rapidata's Rapid Quote II data base created from Telstat Securities Data.
 - Financial analysis using Citicorp's Citibase time series on the U.S. economy.
 - Other important trends for financial and economic data bases are:
 - Vendors are linking data bases to software products.
 - User friendly solutions are becoming commonplace.

- Mainframe to micro capability is getting better or, at least, is perceived to be better.
 - Planning, analysis, and reporting software is available for local manipulation on PCs.
 - The SEC is developing Electronic Data Gathering Analysis and Retrieval (EDGAR). EDGAR provides on-line financial disclosure (10K, etc.) and operates on the Commodore 64 and other PC models.
- Securities analysis and trading through discount brokers is spreading. Examples of brokers and the data base service they provide are:
 - Charles Schwab & Company (Bank of America) - Equalizer.
 - Security Pacific Brokers (Security Pacific) - On-Line Advantage.
 - C.D. Anderson & Company (Security Pacific) - Intelligent Investor.
 - Quick and O-Reilly (through CompuServ) - Quick Way.
 - Fidelity Brokerage Service (Mutual Fund) - Investor's Express.
 - Sixty thousand investors are currently active in use of these services.
 - One hundred percent plus annual growth is occurring.

3. INDUSTRY

a. Types

- Industry data bases contain data targeted to a specific industry, such as airlines, agriculture, automobiles, or steel. While at times containing some

international data, industry data bases primarily contain information about U.S. industrial activity.

- Two types of data bases exist:
 - Data bases containing aggregate economic data such as steel production, tonnage shipped by rail, or compact car sales, stored as time series.
 - Data bases containing data specific to an industry function, such as rail freight rates for small home appliances, fire insurance income for property and casualty firms, or tankers carrying over 100,000 barrels of crude petroleum.
- Over 70 industry data bases were identified as falling into the following sectors:
 - Process manufacturing (18).
 - Transportation (18).
 - Discrete manufacturing (12).
 - Insurance (8).
 - Other (14).

b. Market Forecast

- As shown in Exhibit IV-5, the market for industry data bases was just under \$80 million in 1984 and will exceed \$300 million in 1990, for an average growth of 25% annually over the forecast period.

EXHIBIT IV-5

FORECAST OF USER EXPENDITURES FOR
INDUSTRY ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 9	\$ 11	\$ 30	22%
Information Services Vendors	70	90	280	25
Value-Added Network Vendors	-	-	-	-
Total	\$79	\$101	\$310	25%

- Data base vendors (just 11% of the 1985 market), recognizing the value of delivering information on-line to familiar end users, are migrating into the category of information services vendors.
- The automobile industry in the discrete manufacturing sector and agriculture in the process manufacturing sector are stimulating the growth of information services industry data base services, as shown in Exhibit IV-6.

c. Key Data Bases and Vendor Services

- Agridata Resources, Inc., specializes in delivering (through its agridata network) on-line data base services to the agricultural industry. Data bases include:
 - General, business, and financial news.
 - Agricultural business, markets, and commodity news.
 - Agricultural data.
 - Futures price quotations and trading data.
 - Market price quotations and trading data for crops and livestock in the United States and Canada.
 - Market analysis and advisory services.
 - Current and historical market prices.
 - Agricultural weather.
 - U.S. government agricultural reporting.

EXHIBIT IV-6

FORECAST OF USER EXPENDITURES FOR
INDUSTRY ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Discrete Manufacturing	\$23	\$28	\$ 95	29%
Transportation	18	28	80	23
Process Manufacturing	10	12	40	27
Banking and Finance	9	11	35	26
All Others	10	11	35	26
Total	\$70	\$90	\$285	27%

- Dairy information.
- Livestock auctions and sales.
- Agricultural chemical information.
- The agridata network interfaces with a variety of personal computers and intelligent data terminals. Current customer base in excess of 3,000 is growing more than 50% annually.
- Other agricultural data bases include:
 - The agricultural data bank offered by DRI contains over 65,000 time series related to crop production, acreage, livestock production, farm prices and income, and industry aggregate data.
 - The agricultural data base offered by Evans Economics, Inc. contains 900 time series on a weekly to annual basis on supply and use of agricultural commodities.
 - The inorganic and fertilizer agricultural data bank produced by Probe Economics, Inc., contains more than 1,000 time series related to fertilizers, industrial gases, and other chemicals used in the agricultural industry.
 - An agricultural data bank produced by Marketing Information Data Services, Inc. covers aggregate economic data on the agricultural industry, including acreage, products, inventory, production, and equipment.
 - The U.S. agricultural data base produced by Chase/IDC contains 11,000 time series of aggregate economic information supplied by the U.S. Department of Agriculture.

- A. M. Best Company is the major producer of data bases related to the insurance industry. The data bases contain time series on more than 500 variables for approximately 3,000 insurance companies, including property, casualty, life, and accident/health. Until recently, the data bases were offered to a variety of vendors, including Chase/IDC, DRI, and CDC/BIS. A. M. Best is in the process of selecting one information services vendor to better concentrate its market focus and effort.
- Other insurance data bases include:
 - ACT Star Plus, an actuarial data base produced and offered by STSC, Inc.
 - An insurance industry data base produced by the National Association of Insurance Commissioners containing balance sheet data on approximately 5,000 U.S. insurance companies.
 - A regional insurance data bank produced by DRI contains 7,000 time series of economic data related primarily to property and casualty insurance on a state-wide basis.
- Numerax, Inc. maintains a data base of freight rates for all classes of goods shipped by air, rail, or truck between any point in the United States. Data includes such items as origin, destination, products, weight, and type of carrier.
- Other transportation data bases include:
 - The Official Airline Guide (OAG) offered by Dun & Bradstreet contains the data base of scheduled activity for over 650 North American and international airlines.

- The transportation data bank produced and offered by DRI contains approximately 30,000 time series of aggregate economic information for product traffic by transportation mode.
- Marine data bases are produced by Maritime Data Network, Ltd., and include a ship's library for commercial ships over 1,000 tons, a charter library, a tanker's casualty and ship's casualty library, a ship's movement library, and a ship's construction library containing key data for maritime vessels under construction.
- A number of data bases containing aggregate statistical information concerning airline traffic is maintained by The Computer Company for the Civil Aeronautics Board. The data bases contain financial, cargo, and traffic statistics, route loading, and charter flight statistics.
- CDC/BIS offers the ORR construction costs data base, containing eight levels of cost information for 150 building types. Data contains cost, labor rates, life cycle rates, and value engineering for buildings in 100 cities.
- Other construction data bases include:
 - A computerized building cost data base produced by E. H. Boeckh that estimates actual and replacement cost value for residential, commercial, and industrial structures, offered through GEISCO.
 - A construction and building permits data base produced by Marketing Information Data Systems containing annual data of building permits and construction costs for a wide variety of structures, offered by GEISCO.
 - A construction-potential data bank produced by McGraw-Hill Information Systems Company, containing monthly time series of contract value, square footage, and other related data for 200 structural types throughout the U.S., offered through DRI.

- Chase/IDC specializes in offering data base services related to the automotive industry. Data base services include:
 - The Car Line specifications data base contains 1,000 time series on prices, fuel economy, and technical statistics on domestic and selected imported cars.
 - The North American Car Line data base contains 200 quarterly time series for automobile production.
 - The North America Truck Line production data base contains 100 quarterly time series on domestically produced light trucks.
 - Ward's Auto Info Bank contains over 12,000 data items on supply, demand, and options on U.S and imported cars and trucks.
- Other automotive data bases include:
 - Automotive News Data Bank, produced by the Crane Automotive Group, Inc. and offered by DRI, contains 3,000 time series on automotive production, options, supply, prices, and sales.
 - Automotive data base, produced by the Wharton Econometric Forecasting Associates, contains 1,300 annual time series of aggregate economic information on domestic and imported cars and light trucks.

B. CREDIT GROUP

- All data bases related to the granting of credit, both consumer and commercial (and by financial institutions, corporations, retail, and services organizations) have been included in the credit group.

I. TYPES

- Four types of credit data bases exist:
 - Consumer credit.
 - Commercial credit.
 - Check guarantee and verification.
 - Credit card verification.
- Consumer credit data bases are highly automated.
 - Over 90% of U.S. households are now on file in one or more credit bureau data bases.
 - The data bases are updated using automated accounts receivable in the form of magnetic tapes and, more recently, mainframe-to-mainframe transmissions from credit grantors.
 - Commercial credit data bases are maintained by two major vendors:
 - Dun & Bradstreet through original entry from field interviews.
 - TRW from a combination of automated data from trade associations and selected items from Standard and Poor's.
- Check guarantee and verification data bases are created from either magnetic tape or computer-to-computer transmission supplied by participating financial institutions. Verification data bases are essentially negative account data.

- Credit card verification data bases are created from either magnetic tape or computer-to-computer transmission supplied by the participating credit card processors and associations.
- Most of the data bases are integrated with the credit services offered.

2. MARKET FORECAST

- As shown in Exhibit IV-7, user expenditures for credit on-line data base services, over \$500 million in 1984, will more than double by 1990.
- The market for credit information services is highly cyclical, rapidly declining in recession and lagging during business recovery. A mature consumer credit market segment will hold overall aggregate growth to 14% annually over the forecast period.
- Nearly 40% of all credit on-line services are delivered to the retail distribution sector, as shown in Exhibit IV-8.
- User expenditures in the discrete and process manufacturing sectors, 25% of total expenditures, are primarily related to commercial credit services.

3. KEY DATA BASES AND VENDOR SERVICES

- Dun & Bradstreet, with over 11,000 subscribers to its DunSprint Corporate Credit Service and holding well over 80% of the business credit marketplace, is offering its data base services on-line through its credit offices and selected corporate clients. D&B's latest product offering--Dun's Plus--is based upon the IBM PC/XT. The service will include access to D&B data bases including DunSprint, the OAG, and Dun's Financial Profiles, as well as other vendors financial information services data bases.

EXHIBIT IV-7

FORECAST OF USER EXPENDITURES FOR
CREDIT ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 50	\$ 58	\$ 130	18%
Information Services Vendors	460	525	1,010	14
Value-Added Network Vendors	-	-	-	-
Total	\$510	\$583	\$1,140	14%

EXHIBIT IV-8

FORECAST OF USER EXPENDITURES FOR
CREDIT ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Retail/Distribution	\$178	\$204	\$1,415	15%
Discrete Manufacturing	89	100	190	14
Services	70	88	160	13
Banking and Finance	56	60	110	13
Process Manufacturing	30	34	65	13
All Others	37	39	70	12
Total	\$460	\$525	\$2,010	14%

- TRW Business Credit offers business credit reporting to over 2,500 users through its own distribution network. TRW Credit Services also supplies consumer credit services to over 20 of its own credit bureaus and over 50 others.
- Computer Sciences Corporation, through its acquisition of Associated Credit Services, Inc., is becoming an active participant in the credit services marketplace.
- Other vendors supplying credit data base services to both their own and independent credit bureaus are:
 - Transunion Credit Services, supplying on-line services to 12 of its own as well as to 14 other credit bureaus.
 - Equifax, supplying services to 10 of its own as well as 80 other credit bureaus.
- TeleCredit offers check authorization and verification services to well over 100,000 retail outlets. TeleCredit data bases, developed from banking, retailing, and law enforcement information, can be queried 24 hours a day, seven days a week. Well over two-thirds of the inquiries into TeleCredit's data bases are automated, requiring no telephone operation intervention.
- Tymshare, through its TeleCheck services, both directly and through franchise operations offers check verification services utilizing its consumer data bases. Credit card authorization services are offered through retail point-of-sale terminals.

C. TEXT/BIBLIOGRAPHIC GROUP

- Data bases have been included in this group because they are textual rather than numeric in data content, are used for reference as contrasted to analysis, and require specialized access and search software to be used effectively.

I. BIBLIOGRAPHIC

a. Types

- Bibliographic data bases contain textual information that is meant to lead the user to the source of the required information. The data base may contain indices, citations, or abstracts of the source material.
- Bibliographic data bases refer to a wide body of printed information from journals, newsletters, conference proceedings, magazines, newspapers, and government reports.
- Bibliographic data bases are often produced as a byproduct of electronic publishing.
- Professional institutes and other nonprofit organizations, such as the American Medical Association, are one major class of bibliographic data base producers.
- Government departments and institutes, particularly federal (e.g., the National Institute of Health), constitute another major producer.
- There is a trend toward including full text in selected categories of bibliographic data bases.

- On-line bibliographic data base services require sophisticated information storage and retrieval software, software which until recently has only been effective on large-scale computers with large on-line data storage capability.
- Information specialists, such as librarians trained in search techniques and articulate in key-word association, frequently act as intermediaries between the bibliographic data base service and the ultimate user.
- Microprocessor-driven software operating on personal computers is rapidly expanding the user base by making access and search of a wide variety of services offerings user friendly and effective.

b. Market Forecast

- The market, currently at \$155 million in 1984, will, as shown in Exhibit IV-9, approach \$500 million in 1990.
- The geographic diversity of end users favors delivery of on-line bibliographic data base services through value-added network vendors. The largest vendor, Dialog, is developing its own network.
- Aware of the potential loss of royalty revenue from downloading onto micro-computers, data base vendors are raising data base subscription fees and, often, fees with print publication services.
- Growth in the bibliographic on-line data base services market sector is, as shown in Exhibit IV-10, moderated by continued budget constraints in the education and government industry sectors.

c. Key Data Bases and Vendor Services

- Well over 200 on-line, machine-readable bibliographic data bases not directly associated with other data base sectors were identified, covering such major disciplines as:

EXHIBIT IV-9

FORECAST OF USER EXPENDITURES FOR
BIBLIOGRAPHIC ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 26	\$ 32	\$ 95	24%
Information Services Vendors	105	123	260	16
Value-Added Network Vendors	24	29	115	32
Total	\$155	\$184	\$470	21%

EXHIBIT IV-10

FORECAST OF USER EXPENDITURES FOR
BIBLIOGRAPHIC ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Discrete Manufacturing	\$ 34	\$ 40	\$ 95	19%
Education	16	18	35	13
Process Manufacturing	8	10	25	20
Services	8	11	25	18
State and Local Government	6	7	15	16
All Others	33	37	65	12
Total	\$105	\$123	\$260	16%

- Psychology.
- Chemistry.
- Social sciences.
- Biological sciences.
- General literature.
- Engineering.
- Earth sciences.
- Education.
- Cambridge Scientific Abstracts produces six major data bases:
 - Aquatic science and fisheries.
 - Conference papers index.
 - Mechanical engineering abstracts.
 - Life sciences abstracts.
 - Oceanic abstracts.
 - Pollution abstracts.
- Information Access Company (a ZIFF-Davis subsidiary) specializes in business-oriented bibliographic information.

- Magazine index.
- National newspaper index.
- Trade industry index.
- Legal resource index.
- News search from updated daily.
- Information Handling Services, Inc., specializing in specifications and standards, offers four bibliographic data bases:
 - Military and federal specifications and standards.
 - Industry and international standards.
 - Technical vendor specifications and standards
 - Standards associations voluntary standards.
- SDC Information Services is branching out in its services offerings--beyond that of on-line data base services.
 - Installing software in Fortune 500 corporate information centers.
 - Providing facility management services to the Trademark Division, U.S. Patent Office--a system that will handle both textual and image data.
- In addition to offering on-line data base bibliographic retrieval services and installing its search software on IBM mainframes, BRS is specializing in the development of private data bases on mini/micro computers.

- BRS Search mini/micro software, written in the C programming language, is transportable.
- The system runs under the UNIX operating system on the VAX mini-computer and on large microprocessors such as Onyx and Plexus.
- Quadra Associates, Inc. specializes in the development of in-house corporate information centers. Their STAR bibliographic search and retrieval system operates on Altos minicomputers.
- The Ohio Cooperative Library Corporation (OCLC), a nonprofit educational corporation, provides on-line bibliographic cataloging services through 24 independent networking organizations to over 3,000 libraries utilizing in excess of 5,000 on-line terminals.
 - College and university libraries (53%), together with public libraries (16%), are the major users.
 - OCLC is shifting to an IBM PC for their 300 workstations in order to offer a variety of other services including integrated ordering, accounting, and the ability to interface with microprocessor software such as Lotus 1-2-3.

2. LEGAL/ACCOUNTING

a. Types

- Legal/accounting data bases contain a wide variety of information on statutes, decisions, opinions, standard practices, pending legislation, corporate disclosure, case description, and case annotation.

- Data bases are of three types:
 - Indices referring the user to a body of information in printed form, primarily legal/accounting, journals, and periodicals.
 - Citations and abstracts offering both referrals and opinions or discussions of legal/accounting interpretation of printed material, usually law/accounting library books and official publications.
 - Full text of law, case summaries, legal opinions, statutes, new rulings of federal and state courts, pending legislation, and corporate disclosure.
- There has been a continual shift from citation and abstract data bases to fulltext data bases due to:
 - Decreasing auxiliary storage costs, both mainframe and local.
 - Improved fulltext search software.
 - Microprocessor-driven intelligent terminals and personal computers.
 - The implications of legal "due diligence" in an electronic age.

b. Market Forecast

- Information services vendors, as shown in Exhibit IV-11, dominate (84%) the current marketplace. However, a number of specialized data base vendors, particularly in legislative and corporate disclosure areas who offer their services through value-added network vendors, are leading expenditure growth, which will exceed \$590 million in 1990.

EXHIBIT IV-11

FORECAST OF USER EXPENDITURES FOR
LEGAL/ACCOUNTING ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 12	\$ 16	\$ 60	30%
Information Services Vendors	125	157	480	25
Value-Added Network Vendors	11	10	55	31
Total	\$148	\$183	\$595	26%

- The services (lawyers/accountants) sector utilizes over 70% of total current expenditures, as shown in Exhibit IV-12.
- Growth in use by federal and state courts and legal departments is limited by both budgetary constraints and the availability of an on-line legal data base system maintained by the U.S. Justice Department.

c. Key Data Bases and Vendor Services

- Capitol Services, Inc. specializes in data base services related to congressional activity.
 - The Congressional Record data base contains abstracts of bills before Congress, subcommittee reports, floor actions, and public laws.
 - The Federal Index contains citations on the Congressional Record, Federal Register, and presidential documents.
 - Federal Register Abstracts covers each document published in the Federal Register.
- Tax Analysts, Inc. maintains fulltext data bases related to federal taxation.
 - Tax Notes includes general counsel, treasury decisions, and tax legislation.
 - Tax Notes Today covers federal tax developments, including court decisions, IRS rulings, accounting standards or reports, and tax bulletins. Several states have automated their legislative bill status system, making the data bases available to interested vendors:
 - State of Illinois Legislative Information System.
 - State of Oregon Legislation Administration Committee.

EXHIBIT IV-12

FORECAST OF USER EXPENDITURES FOR
LEGAL/ACCOUNTING ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Services	\$ 90	\$115	\$365	26%
Federal Government	8	9	20	20
Discrete Manufacturing	6	8	25	26
Banking and Finance	5	6	20	26
All Others	16	19	50	21
Total	\$125	\$157	\$480	25%

- . Alaska Legislative Information System.
- . Hawaii Legislative Information System.
- Disclosure, Inc. maintains a data base of more than 8,500 publicly owned companies filing reports with the SEC. The information includes 10Ks, proxy statements, annual reports, tender offer/acquisition reports, financial data for two fiscal years, and management comments.
 - The data base is offered through at least eight information services vendors, including Mead.
 - Disclosure markets software for the IBM PC to enable downloading and analysis of information available in the data base.
- Public Affairs Information, Inc. offers on-line data base services related to state and federal legislative and regulatory affairs. Data bases include monitoring of the current status and legislative history of all measures introduced in the 50 states and Congress, as well as extensive state and federal regulatory information. The data base includes 100% of all bills and proposed regulations.
 - Services are rendered to more than 800 corporations, trade associations, public agencies, and individuals.
 - The service includes electronic mail and document services.
 - The system interfaces with the automated legislative files in selected states.
- Mead Data Central (MDC), the largest vendor of legal on-line data base services with over 110,000 users and 1984 revenues approaching \$100 million, offers six major on-line data bases.

- Legal data bases covering tax, securities, energy, labor, bankruptcy, trade regulation, and communications.
- Case law for all 50 states and the Supreme Court.
- Autocite (case law citations from Lawyers Cooperative Publishing Company).
- Shepherd's citations.
- Matthew Bender publications.
- Patents and trademarks.
- MDC is shifting emphasis from special-function terminals to microprocessors. The system currently supports the IBM PC, the DisplayWriter, and IBM 3101 terminals.
- MDC has recently reduced and altered its pricing structure. Pricing will now consist of three separate charges:
 - A fixed search cost ranging from \$9 to \$18 per search.
 - Connect time charge of \$20 per hour.
 - VAN charges averaging \$8 per hour.
 - A 50% discount for using the services during off-peak hours.
- West Publishing Services Company offers legal on-line data base services with its West Law System that utilizes value-added network vendors. Data bases can be accessed through a variety of intelligent terminals and, most recently, through software marketed for the IBM PC. Data base coverage includes:

- Business law.
- Communications.
- Energy.
- Federal regulatory affairs.
- Insurance.
- Labor and employment.
- U.S. Federal law.
- State law.
- Patents.
- Securities.
- Other West Law legal on-line data base references include:
 - Shepherd's Citations.
 - West Law Case Highlights.
 - West Law Tax Highlights.
 - Citation Index to Federal and State Cases.
 - American Bar Association's References and Citations.

D. NEWS GROUP

- Data bases are emerging for the electronic publishing of information in textual and, more recently, image form. Data bases related to current business, government, and commercial markets are included in the news group.

I. TYPES

- News data bases contain information from leading newspapers such as the Wall Street Journal and The London Times, from leading wire services such as the Associated Press or Reuters, from leading newspaper publications such as Barron's, Time, or the London Economist, and from newsletter services such as The Wellington Letter, Forbes Investment Review, and Fed Watch.
- There are two types of data bases:
 - Citation or abstract data bases such as The New York Times information bank containing key information in an attempt to eliminate the need to reference the full text.
 - Fulltext data bases such as NewsNet's Newsletter Service.
- Spurred by decreased on-line storage costs, improved access and search software, and personal computers, the market is rapidly shifting to fulltext news data bases.

2. MARKET FORECAST

- The market for news data base services, currently over \$250 million and forecasted to grow 32% annually and reach \$1.3 billion by 1990, is directed primarily toward companies and institutions. Details are in Exhibit IV-13.

EXHIBIT IV-13

FORECAST OF USER EXPENDITURES FOR
NEWS ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 19	\$ 24	\$ 75	26%
Information Services Vendors	220	290	1,160	32
Value-Added Network Vendors	13	16	65	32
Total	\$252	\$330	\$1,300	32%

- Distribution systems such as Knight-Ridder and Times Mirror View-Data Systems and the more recent IBM-Sears-CBS announcement aimed at delivering on-line news data bases to individuals (including consumers) could well result in explosive growth in this market segment.
- Remote computing, network delivery services, and the vertical integration of data base production result in information services vendors having over 85% of the current market as well as the largest growth rate (32% AAGR).
- News on-line data base services are utilized in some degree by all market sectors, with the primary concentration in the five sectors shown in Exhibit IV-14.
 - Accelerated growth (33%) in the services sector is due to new offerings tailored to news broadcasters, editors, advertising executives, lawyers, and marketing personnel.
 - Accelerated growth in the banking and finance sector is due to the rapid expansion of Dow Jones News Retrieval service to the individual investor marketplace.

3. KEY DATA BASES AND VENDOR SERVICES

- NewsNet, Inc. specializes in newsletter data base services. The number of newsletters on-line has grown from three in 1982 to over 175. Information is accessed by Tymnet, Telenet, and Dialcom. Search software is available on the IBM PC. Over 5,000 corporate and individual users currently subscribe to the service.
- With well over 130,000 subscribers, Dow Jones news retrieval is an excellent example of delivery of on-line news data base services to both corporate and

EXHIBIT IV-14

FORECAST OF USER EXPENDITURES FOR
NEWS ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Services	\$ 50	\$ 72	\$ 300	33%
Discrete Manufacturing	33	44	165	30
Banking and Finance	26	32	95	24
Transportation	21	31	85	22
Retail/Distribution	15	20	95	36
All Others	75	91	420	36
Total	\$220	\$290	\$1,160	32%

individual end users. In addition to on-line information services, Dow Jones markets software for the IBM PC which assists search and analysis of the information contained in 27 data bases.

- Telerate, Inc. offers on-line financial market data information services to security firms, banks, other financial institutions, and corporations. The on-line system serves more than 4,000 subscribers utilizing over 7,000 Telerate video terminals. The network also serves approximately 1,200 subscribers in over 20 countries outside of the U.S. through over 2,000 terminals. The Telerate system offers pages of information, some of which are Telerate supplied and others which are offered by data base vendors such as Money Markets, Inc.
- Reuters of North America provides financial news services (domestic and international) through a monitor service similar to Telerate's. There are approximately 2,000 users of the Reuter monitor service in the U.S. Special attention is given to foreign exchange and commodities, including futures.
- Mead Data Central, with its NEXIS service, offers news data base services including The New York Times Information Bank, four other newspapers, some twenty magazines, five wire services including AP and Reuters, and some 20 newsletters including Coal Week, Electric Utility Week, the Morgan Guaranty Survey, and World Financial Markets. NEXIS' latest offering, called The Exchange, includes a data base of in-depth analysis from investment firms on more than 1,500 companies in 100 industries.
- CompuServ offers business information services from over 100 news data bases to over 1,000 corporate users and 100,000 individual users nationwide.
 - Service to individuals was first marketed through Radio Shack for the TRS-80 personal computer. Access and analysis software is now available for the IBM and a wide range of other personal computers.

E. OTHER GROUP

- Data base types that were not classified in the above four groups have been included in the "Other" Group, completing the grouping structure as presented in INPUT's Annual Report of Information Services Markets (see Appendix B).

I. MARKETING

a. Types

- Marketing data bases are highly specialized data bases containing consumer data on such items as retail products, buying habits, and radio and TV preferences.
- Marketing data bases are usually offered bundled as part of printed subscription services. Marketing data base subscription fees of \$20,000 or more are not uncommon.
- Marketing data bases are offered by data base vendors directly or, frequently, through information services vendors who often offer special value-added software useful for market and media analysis and forecasting.
- There are four types of marketing data bases:
 - Data bases that contain consumer retail product data, such as the SAMI product movement data base.
 - Data bases that contain consumer audience data, such as Media Market Research, Inc.'s consumer surveys.
 - Data bases that contain media data, such as Media Market Research, Inc.'s media market data bases.

- Data bases that contain aggregate economic data, such as The Lumberg Report on petroleum prices and movements from Lumberg Surveys, Inc.

b. Market Forecast

- Spurred by automated data collection such as automated audience recorders, data scanners, hand-held data recorders, and automated data transmission, the market for marketing data base services, over \$230 million in 1984, will exceed \$900 million in 1990, experiencing an annual growth rate of 27% for the forecast period. Details are shown in Exhibit IV-15.
- Recognizing the value-added nature of the data, data base vendors' subscription services represent the major source (66%) of user expenditures.
- Major data base vendors (such as A. C. Nielsen) that have integrated data bases with the computing services will accelerate information services vendor growth during the forecast period.
- Sustained growth in value-added network services results from the continued entry of new data base vendors, such as Market Data Retrieval, Inc., which delivers products and services through VANs.
- Retail and discrete manufacturing are, as shown in Exhibit IV-16, the major market sectors, together comprising just over 50% of total 1984 user expenditures placed with information services vendors.

c. Key Data Bases and Vendor Services

- The study identified nearly 40 marketing data bases--double the number identified in 1980.

EXHIBIT IV-15

FORECAST OF USER EXPENDITURES FOR
MARKETING ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$155	\$190	\$560	24%
Information Services Vendors	65	85	290	28
Value-Added Network Vendors	13	16	65	32
Total	\$233	\$291	\$915	27%

EXHIBIT IV-16

FORECAST OF USER EXPENDITURES FOR
MARKETING ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Discrete Manufacturing	\$21	\$29	\$100	28%
Retail/Distribution	12	16	70	34
Wholesale	8	11	40	31
Process Manufacturing	7	9	30	28
All Others	17	20	60	24
Total	\$65	\$85	\$300	27%

- Information Resources, Inc., produces Market Facts, which contains market data on the purchases made by 20,000 U.S. households, including the use of coupons, promotions, displays, and advertising features.
- Mendelson Media Research, Inc. produces a data base of media and marketing data on consumers having incomes of over \$40,000 annually.
- J. D. Powers & Associates produces an automotive consumer profile data base containing demographics, driving habits, the characteristics of current vehicles in use, purchase intentions, etc.
- A. C. Nielsen, the leading vendor of marketing data base services, offers data base services by subscription and on-line consisting of:
 - Coordinated Management Systems, located in Minneapolis, offering retail data base services.
 - Media Research Operations Center, located in Florida, offering media data base services.
- Management Science Associates, Inc. offers over 10 data bases, including the Nielsen station and television indexes and the SAMI data bases. It also offers specialized software to advertising agencies in radio and television media departments.
- Telmar Media Group, one of the leading vendors of on-line marketing information services, offers nearly 20 data bases, including Arbitron Radio and T.V., the Target Group Index to over 500 advertising agencies, publishers, broadcasters, market research companies, and media departments of large corporations.
 - Telmar's latest offering, Micronet Service, downloads its access and analysis software on IBM PCs.

- Over 20% of 1983 revenues are related to Telmar's value-added vendor relationships with IBM and from sales of its software products.
- GEISCO offers seven marketing data bases produced by Marketing Information Data Systems, Inc., together with software for market research and planning.

2. MEDICAL

a. Types

- The study identified over 50 data bases related to medicine and medical services.
- Four types of medical data bases are:
 - Bibliographic data bases, by far the largest category, refer to medical research.
 - News data bases contain current information on drugs, treatments, medical alerts, and disease control.
 - Financial, economic, and marketing data is related to drugs, hospital supplies, and medical services costs.
 - Image data is related to drug molecular structure and, more recently, to sonic and X-ray images.
- Up to recently most medical data bases have resulted from federal government (NIH and National Library of Medicine) or government-supported (Center for Disease Control) activities.

- But the growing emphasis on medical services cost containment offers increasing opportunity for data base services related to laboratories, clinics, nursing homes, hospitals, etc.
- Technology, in the form of microprocessors and video disc storage, offers opportunities for the acquisition and storage of medical image data bases for both record retention and medical analysis.

b. Market Forecast

- User expenditures for medical on-line data base services are about \$45 million in 1984 and will increase by a factor of six to over \$280 million in 1990, as shown in Exhibit IV-17, paced by quantitative and image data bases.
- User expenditures will be increasingly focused on vendors such as MDC, IBM, and National Data Corporation, rather than the federal government and bibliographic retrieval services vendors such as Lockheed's Dialog.
- Although the medical sector is, as shown in Exhibit IV-18, the largest user of on-line medical data base services, other sectors such as discrete manufacturing (pharmaceuticals) and services (druggists and physicians) are making increasing use of medical on-line data base services.

c. Key Data Bases and Vendor Services

- The National Library of Medicine maintains and offers on-line some 20 data bases, primarily bibliographic and related to biomedicine, health, health care, toxic effects, the environment, and medical research. Subscribers are primarily educational institutions and medical research centers worldwide.
- GTE offers MINET, a medical information network to over 3,000 users, half of whom are practicing physicians. MINET includes AMA/NET's five data bases of medical information on drugs, disease, medical procedure, economic infor-

EXHIBIT IV-17

FORECAST OF USER EXPENDITURES FOR
MEDICAL ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$14	\$18	\$ 60	27%
Information Services Vendors	25	35	190	40
Value-Added Network Vendors	6	8	35	34
Total	\$45	\$61	\$285	36%

EXHIBIT IV-18

FORECAST OF USER EXPENDITURES FOR
 MEDICAL ON-LINE DATA BASE
 INFORMATION SERVICES BY INDUSTRY SECTOR
 1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Medical	\$11	\$16	\$110	47%
Discrete Manufacturing	5	7	35	38
Education	4	5	20	30
All Others	5	7	25	29
Total	\$25	\$35	\$190	40%

mation and clinical literature, electronic mail, and reference services of hospital information and medical training.

- National Data Corporation provides on-line data base services, including personal computers, to druggists and pharmacists. One of four data bases contains data produced by the American Druggists Bluebook data center on pharmacology, drugs, and drug side effects.
- IMS America Ltd. produces and offers seven major pharmaceutical data bases:
 - U.S. pharmaceutical market--drug stores.
 - U.S. pharmaceutical market--hospitals.
 - National disease and therapeutic data.
 - National prescription audit.
 - National detailing audit.
 - National journal audit.
 - National mail audit.
- The IMSPAC data bases are used by hospitals, druggists, pharmaceutical producers, distributors, and the federal government for marketing, research, and sales analysis.
- The American Society of Hospital Pharmacists offers its on-line data base of drug formulation, compatibility, testing, and dosage in fulltext form through DIALOG and BRS.

- The most recent addition is PHYCOM, a data base offered by Fisher Stephens, Inc. covering prescription drugs.
- The data base service allows electronic mail between doctors and drug companies regarding samples and other information.
- Mead Data Central is entering the medical information services marketplace using a data base from American Health Consultants. The data base will contain the fulltext of 12 monthly newsletters dealing with lasers, contraceptives, hospital procedures, and surgicenters.
- The American Hospital Association Medical Device data base, containing data concerning 50,000 medical devices and supplies, is offered through the IBM Information Network.

3. INTERNATIONAL

a. Types

- International data bases containing information about a foreign country or continent are created and maintained by both U.S. producers and by foreign organizations. The data bases may be bibliographic, financial/economic, news, or any other. They have been classified as international to highlight their increased use within the U.S.
- User expenditures refer to data bases produced by U.S. vendors for direct subscription and to data bases produced by U.S. and foreign vendors and offered through on-line services by U.S. information services vendors.
- The last three years have seen a proliferation of international data bases to over 120, with a three-year annual growth exceeding 50% annually.

- Although the majority of the international data bases are numeric (financial, economic, and econometric), more recent offerings include fulltext (news and legal) offerings.

b. Market Forecast

- Spurred by increased trading activity by the multinationals in both Europe and the Far East, and coupled with the availability of more data on foreign economies and industries, the market for international data base services, just over \$40 million in 1984 as shown in Exhibit IV-19, will more than quadruple by 1990.
- Using satellite communications, information services vendors will add value by offering timeliness and variety in service offerings.
- As shown in Exhibit IV-20, Fortune 500 companies in the discrete manufacturing sector and large banking and finance institutions account for half of user expenditures to information services vendors.

c. Key Data Bases and Vendor Services

- Learned Information Ltd. maintains a Mid-East file data base of bibliographic citations with abstracts about international affairs, news, science and technology, and events in the Mid-East. The file is available through Dialog Information Services, Inc.
- California Institute of International Studies produces a world affairs data base providing assessments gleaned from the Soviet press about Western countries. The data base is available through Dialog Information Services, Inc.
- Multi-national Computer Models, Inc. maintains a statistical and factual information data base about 125 countries. Data from international and

EXHIBIT IV-19

FORECAST OF USER EXPENDITURES FOR
INTERNATIONAL ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$11	\$14	\$ 45	26%
Information Services Vendors	26	34	135	32
Value-Added Network Vendors	3	4	20	38
Total	\$40	\$52	\$200	31%

EXHIBIT IV-20

FORECAST OF USER EXPENDITURES FOR
INTERNATIONAL ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Discrete Manufacturing	\$ 8	\$11	\$ 45	32%
Banking and Finance	5	6	25	30
Federal Government	4	5	20	32
All Others	9	12	45	30
Total	\$26	\$34	\$135	32%

central banks and international publications covers economics, international finance, and international affairs. The data base is available through Dun & Bradstreet Computer Services, Inc.

- World Energy Information Services produces an international energy data base containing approximately 40,000 time series on world-wide energy markets. Included are petroleum, coal, nuclear, and electric power. The data base is offered through Chase/IDC.
- The Bank of England together with the British Central Statistical Office, in a joint venture with DRI, maintains a European data base covering over 16,000 time series on European economies. The data base is offered through DRI.
- Wharton Econometric Forecasting Associates (WEFA) offers, through CISI U.S., international data bases and models covering Mexico, Brazil, the Middle East, and the Pacific Basin, and a world economic model containing 6,000 annual time series covering 32 countries and areas.
- Data Resources (DR) maintains international data bases including automobiles, energy, trade, trucks, and aggregate information about less developed countries in Africa, Asia, and Latin America.
- NIKKEI maintains three major data bases on the Japanese economy, which are available through DRI:
 - Economic statistics containing 12,000 aggregate economic time series on the Japanese economy.
 - An energy data base containing 3,300 time series on Japanese supply and demand. Covered are oil, gas, electricity, nuclear power, and petrochemicals.

- Corporations financial data base containing time series on balance sheet and income statement data for 1,700 companies listed on the Japanese stock exchanges.
- CISI U.S. is now offering a comprehensive data base of international economic statistics (CRONOS, produced by the EUROSTAT). The data base contains:
 - 50,000 time series of general economic statistics.
 - 25,000 time series for national accounts and balance of payments.
 - Over 30,000 time series on industries and services.
 - Over 25,000 time series on agriculture.
 - Over 100,000 time series on foreign trade.
 - 16,000 time series on research and development.

4. DEMOGRAPHIC

a. Types

- Demographic data bases are numeric, containing data on households, family income, expenditures, housing, population, employment, and education.
- Completion of the 1980 census has allowed expansion of demographic data bases. The study of population shifts, consumer income and preferences, etc. are possible through correlation and estimation techniques applied to the 1970 census data.
- Demographic data bases are differentiated into two types by the degree of data aggregation:

- Data bases aggregated at the city, state, regional, and national level are used for general economic analysis and planning.
- Data bases aggregated by standard metropolitan statistical area (SMSA), zip code, latitude/longitude, county, area of dominant influence (ADI), and through centroid techniques are used for marketing, advertising, and political analysis.

b. Market Forecast

- User expenditures will rise by a factor of four between 1984 and 1990, resulting in 27% annual growth over the forecast period as shown in Exhibit IV-21.
- Demographic data bases are often used in conjunction with other data base types such as financial, economic, marketing, and econometric.
- Demographic data bases are usually used with value-added software, such as for site selection, resulting in significant data-base-related revenues.
- Four sectors, led by services, account for half of user expenditures to information services vendors. Exceptional growth in the services sector results from the continued shift to services in the U.S. economy. Details are in Exhibit IV-22.

c. Key Data Bases and Vendor Services

- SiteNet, an on-line geo-economic data base which provides basic site screening in 20 states and was developed by Conway Data Inc., is offered by CompuServ.

EXHIBIT IV-21

FORECAST OF USER EXPENDITURES FOR
DEMOGRAPHIC ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$15	\$19	\$ 70	30%
Information Services Vendors	45	55	175	26
Value-Added Network Vendors	-	-	-	-
Total	\$60	\$74	\$245	27%

EXHIBIT IV-22

FORECAST OF USER EXPENDITURES FOR
 DEMOGRAPHIC ON-LINE DATA BASE
 INFORMATION SERVICES BY INDUSTRY SECTOR
 1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Services	\$ 8	\$12	\$ 75	44%
Discrete Manufacturing	6	8	25	26
Retail/Distribution	5	6	20	29
Banking and Finance	4	5	15	27
All Others	22	24	40	11
Total	\$45	\$55	\$175	26%

- Marketing Information Data Systems offers two demographic data bases:
 - The 1980 census, containing demographic data and current-year estimates.
 - A 1970-1980 census comparison, providing actual values as well as absolute differences for a wide variety of demographic data. The data has been segregated into 10 segments.
 - The data bases are available through GEISCO.
- Donnelly Marketing Information Services produces Census Plus, a demographic data base together with retrieval and analysis software based on the 1970-80 census and available through CDC/BIS. A similar data base, Cluster Plus, patterned after 47 different lifestyles, is available through Dun & Bradstreet Computer Services, Inc.
- SIGNA Data Services Corporation provides a comprehensive set of demographic data bases called DataGraf. The data bases and analysis programs offered through Boeing Computer Services allow the study of environmental issues related to demographic data. The data bases contain information concerning water quality, air quality, emission quality, and natural stream quality. These factors are then coupled with demographic information concerning cancer, mental health, mortality, etc.
- Urban Decision Systems offers an on-site data base together with a retrieval and report generation system permitting analysis of sites contained in geometric shapes useful for marketing and site planning. The system is offered through STSC, Inc.
- CACI Inc. offers Site II, a demographic data base covering the 1960, 1970, and 1980 census, together with current and five-year updates for more than 60,000 census tracks. The Site-Star data base system provides demographic data

used in deriving sales potential for retail stores and financial institutions. These widely used data base services are standard offerings of more than 10 information services vendors including GEISCO, CDC/BIS, CSC, and Tymshare.

- National Planning Data Corporation offers a demographic data base on the 1980 census, plus current-year estimates on five-year projections interacting with software allowing for site planning and marketing. The data base and modeling software are available through ADP network services.

5. RESOURCES

a. Types

- Resources data bases contain data on natural resources such as gas, petroleum, coal, and uranium in the U.S. and Canada, offshore, and to some extent internationally. As a result of the energy crisis, resource data bases associated with exploration and production of oil, gas, and coal have grown at a rate exceeding 70% annually over the past three years.
- The study identified two types of data bases:
 - Data bases containing data specific to resource location, such as well location, drilling cost, reserve, and well production.
 - Data bases containing aggregate economic data, such as oil imports, gas production costs, and coconsumption by states. These data bases are stored as time series useful for financial and economic analysis, etc., and for econometric forecasting.

b. Market Forecast

- With temporarily stabilized prices and resources becoming increasingly scarce in the marketplace, resource data base services, at over \$98 million in 1984, will exceed \$400 million by 1990. The healthy expected growth of 27% annually is shown in Exhibit IV-23.
- The shift of data base vendors, such as the Petroleum Information Corporation, to information services vendors through offering data bases coupled with specialty software directly to end users will spur the 27% annual growth for information services vendors.
- The process manufacturing sector, with increasingly expensive energy exploration and development costs, is the major (53%) user of resources data base services. Details are in Exhibit IV-24.
- Electric power utilities, major users of petroleum, gas, coal, and uranium, are important users of resource data base services.

c. Key Data Bases and Vendor Services

- Petroleum Information Corporation, the largest vendor of resources data bases, has shifted to direct on-line delivery of its five petroleum-industry-related data bases:
 - The active well data makes up a data base of well activity, containing some 40 data elements for all active wells in the U.S., including offshore and Alaska.
 - The drilling activity data base contains some 50 data elements on all oil and gas drilling activity in the continental U.S., including offshore and Alaska.

EXHIBIT IV-23

FORECAST OF USER EXPENDITURES FOR
RESOURCES ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 6	\$ 8	\$ 30	30%
Information Services Vendors	88	110	365	27
Value-Added Network Vendors	4	5	10	15
Total	\$98	\$123	\$405	27%

EXHIBIT IV-24

FORECAST OF USER EXPENDITURES FOR
RESOURCES ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Process Manufacturing	\$21	\$27	\$115	34%
Utilities	6	8	35	34
Federal Government	5	6	20	25
Banking and Finance	4	5	15	26
All Others	3	4	15	30
Total	\$39	\$50	\$200	32%

- The historical well data base covers over 1.5 million completed wells in the U.S.
- The permit data base contains information on all well-drilling permits, pending and granted. The data is updated weekly and covers the U.S., offshore, and Alaska.
- The production data base contains current and historical monthly production volumes and oil reservoir summary data for all U.S. gas and oil wells in the five major U.S. regions.
- The United Communication Group produces and offers nine data bases containing U.S. wholesale price market information on petroleum futures and petroleum products segregated by petroleum administrative districts. The data includes market price alerts, spot prices, price moves, wholesale prices, liquid petroleum prices, petroleum futures, supply and production data, city-by-city averages, and dealer prices.
- In addition to providing data services for well drilling and production data collection, GEISCO offers three major energy data bases:
 - Dwight's Energy Data contains monthly and annual data on oil and gas production for over 600,000 gas wells and oil leases in the continental and offshore United States.
 - The University of Oklahoma petroleum data system contains information on approximately 100,000 gas and oil fields in the U.S. and on the continental shelf.
 - Energy Planning's Texas Gas data base contains records and production data of all natural gas wells in Texas.

- Beadrock Brick Company produces a data base that contains a census of all rotary rigs in the U.S. The data base is available through CISI Network Corporation.
- Computer Petroleum Corporation offers an information and product-trading data base and on-line service (Petronet) for gasoline fuel oils and jet fuel and propane. The data base contains current prices from dealers in 200 U.S. locations. The system permits trading to be accomplished between interested parties.
- DRI maintains a number of resources data bases:
 - CoaLink contains data on coal purchases and shipments to electrical utilities.
 - The oil and gas drilling data bank contains approximately 17,000 time series on gas and oil drilling activity in the United States.
 - The Oil Company Data Bank contains 2,000 annual time series on major U.S. oil and gas companies.
 - Platt's Data Bank contains 6,000 time series on domestic and foreign petroleum and petroleum product prices.
 - The U.S. Energy Data Bank contains over 54,000 time series on sources and uses of all major petroleum products.
- L.A. Martin Associates produces a data base of probable cost to retrieve offshore oil and gas in eight geographic locations. The data base and analysis software are available through Computer Sciences Corporation.
- Chase/IDC offers an energy data base containing over 18,000 time series on supply and demand statistics for petroleum, gas, coal, and electricity.

- Probe Economics, Inc., produces a data base of 500 time series covering supply and demand of coal, natural gas, petroleum, and electricity. The data covers production, consumption, imports, and exports. Consumption data is related to industrial, consumer, and motor vehicle use. The data base is offered through Sage Data, Inc.

6. REAL ESTATE

a. Types

- Two types of real estate data bases exist:
 - Data bases containing textual and numeric information about residential real estate offerings. These data bases are available through real estate agents and brokers.
 - Numeric data bases used for real estate mortgage and housing mortgage market analysis.
- Residential real estate and available mortgage data bases are tied directly to on-line data base vendor services.

b. Market Forecast

- Breaking out of a depressed housing market, revenues for on-line real estate data base services were close to \$125 million in 1984, as shown in Exhibit IV-25. Revenues are expected to grow at a rate of 18% annually over the forecast period and to exceed \$300 million in 1990.
- There is a growing market for offering real estate data base services to a national market consisting of franchise and corporate real estate agencies.

EXHIBIT IV-25

FORECAST OF USER EXPENDITURES FOR
REAL ESTATE ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 42	\$ 48	\$100	16%
Information Services Vendors	81	96	230	19
Value-Added Network Vendors	-	3	10	27
Total	\$123	\$147	\$340	18%

- Real estate data bases are used in just three sectors, as shown in Exhibit IV-26. Real estate agents and brokers in the service sector are the predominant users (90%) of information services vendors' on-line offerings.
- The study identified 20 real estate data bases, more than three times the number in 1980. The annual growth over the three-year period approached 50%.

c. Key Data Bases and Vendor Services

- Marshall and Swift Company maintains and offers a data base containing component building costs for over 100 building types. Analysis software allows evaluation and replacement cost analysis on residential and commercial structures.
- The National Association of Home Builders offers a data base of 30 annual time series on housing starts, building permits, and other related housing variables for all counties in the U.S. Another data base containing 175 time series on housing starts and financial housing market variables is maintained and made available with access and analysis through Chase/IDC.
- Regional Data Associates offers a real estate data base containing over 40,000 time series for the U.S., individual states, and SMSA. This data base covers housing demographics and financial and economic data for residential and nonresidential construction. The data base together with modeling software is available through Chase/IDC.
- PRC Realty Systems offers its on-line real estate data base service as an integrated system. Their latest offering includes an IBM PC as an integrated realty office automation product. The service includes:
 - On-line Listing Service, Real Estate Property Management, Word Processing, Spread Sheet, and financial analysis software.

EXHIBIT IV-26

FORECAST OF USER EXPENDITURES FOR
 REAL ESTATE ON-LINE DATA BASE
 INFORMATION SERVICES BY INDUSTRY SECTOR
 1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Services	\$80	\$100	\$330	27%
Banking and Finance	5	6	20	25
Insurance	3	4	15	27
Total	\$88	\$110	\$365	27%

- Loan Express, which provides the ability to shop for home mortgages nationwide.
- Realtron Corporation offers an on-line data base multilisting service to over 40,000 real estate agents representing 80 realty boards. The latest product offering includes a real estate office management system using the Televideo Personal Computer. Additional services include membership information, mailing lists, billing and accounts receivable, general ledger, and client analysis.
- There are a number of vendors offering access to data bases representing available mortgage funding in what will soon be a national electronic mortgage market:
 - ShelterNet is offered by First Boston Capital Group, with 100 participating vendors in 30 states.
 - Realtor's National Mortgage Access is offered by the National Association of Realtors.
 - Loan Express is offered by Planning Research Corporation.
 - The International Mortgage Exchange is sponsored by Union Planters National Bank.
 - RKI Data Base, offered by Realty Knowledge, Inc., covers 200 originators and lenders in San Francisco and San Diego.
 - Loan Link is offered by TRW.
- Remote Computing, a division of Hale Systems, Inc., maintains and offers the Mortgage Index, a data base that provides centralized quotation and information about the secondary mortgage market.

7. ECONOMETRIC

a. Types

- Econometric data bases contain data, primarily economic or financial in nature, that is stored in time series in frequencies from weekly to annually. The data bases contain aggregate (entire U.S., regional, or sector) as opposed to micro (company, assets, stock price) data.
- There are two types of data bases:
 - Historical data bases, where data is collected, at times adjusted, and validated over a significant time (at least 10 years).
 - Forecast data bases, which contain data estimated by vendors' forecasting models for future time periods, ranging from one week to two years (short range) to annually for up to 10 years (long range).
- Information services vendors combine consulting services with forecasting models, model-building software, and access to on-line historical and forecast data bases. Econometric data base services are used primarily within Fortune 500/50 companies:
 - By chief economists for forecasting interest rates in the economy.
 - By Treasury Department analysts for cash requirements forecasting.
 - By economists for industry and by U.S. economy forecasts.
 - By management scientists for strategic planning.
 - By market research analysts for industry and product analysis.

- The chief economists at very large savings and loan associations use econometric data base services for forecasting money market rates, mortgage markets, and housing activity.
- Econometricians in the federal government use econometric data base services for budgeting, interest rate forecasting, money supply analysis and forecasting, and balance of payment analysis and forecasting.
- Over 60 econometric data bases were identified (double the number in 1980), for a growth of 24% annually over the three-year period.

b. Market Forecast

- With vendors still entering a fairly mature market, user expenditures for econometric on-line data base services were over \$150 million in 1984. As shown in Exhibit IV-27, this figure will mushroom by 1990 to over \$280 million, a steady growth of 32% annually over the forecast period.
 - Growth will continue as college graduates who have been trained in econometric techniques continue to increase their proportion in the corporate marketplace.
 - Sustained growth will also come from the continuing shift from printed reports to on-line data base access.
- There is a significant data base vendor market (37%) in supplying data base subscription services to both large corporations and other information services vendors.
- Companies in the manufacturing sectors and large financial institutions account for, as shown in Exhibit IV-28, over half of company expenditures used for on-line data base services provided by information services vendors.

EXHIBIT IV-27

FORECAST OF USER EXPENDITURES FOR
ECONOMETRIC ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$15	\$20	\$ 75	30%
Information Services Vendors	39	50	200	32
Value-Added Network Vendors	-	2	10	38
Total	\$54	\$72	\$285	32%

EXHIBIT IV-28

FORECAST OF USER EXPENDITURES FOR
ECONOMETRIC ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Banking and Finance	\$19	\$24	\$ 65	22%
Discrete Manufacturing	17	20	45	18
Process Manufacturing	10	13	40	25
Federal Government	7	8	15	13
Services	6	8	25	26
All Others	22	23	40	12
Total	\$81	\$96	\$230	19%

c. Key Data Bases and Vendor Services

- An essential ingredient in offering econometric data base services is the national reputation of the head econometrician:
 - Lawrence Chimerine at Chase/IDC.
 - Lawrence Klein at Wharton Econometric Forecasting Associates.
 - Michael Evans at Evans Economics.
 - Allan Greenspan at Townsend-Greenspan.
 - John Rutledge at Claremont Economics Institute (CEI).
 - A. Gary Shilling from Shilling and Company, Inc.
 - Albert H. Cox at Merrill Lynch Economics.
- Econometric data base services are offered with a wide array of economic models, forecasts based on the models, and on-line models by clients to produce individual forecasts.
- DRI is shifting significant econometric computational capability onto personal computers and changing its pricing structure to accommodate downloading of selected data bases through its "DRI-link."
 - Initially, DRI used its own micro utilizing Zilog hardware.
 - More recently, DRI has interfaced with the IBM PC/XT.

- Sage Data Incorporated, a recent entry in the econometric data base services marketplace, offers a number of econometric data bases developed by Probe Economics through both their own and CompuServ's networks.
 - Specialized software (called Sage PC), interfacing with IBM PCs and widely available micro packages such as Lotus 1-2-3, provides easy-to-use, menu-driven, mainframe-to-PC downloading, quality graphics, electronic mail, and data analysis.
 - An econometric modeling and data base management system including a graphics software package operates under VM/CMS for IBM mainframes.
- Chase/IDC, with nearly a thousand clients, offers two forecast models:
 - An interest rate model forecasts 140 items such as interest rates, the money supply, credit and debit markets, and commercial paper. The model provides alternative forecasts for higher and lower interest rates.
 - A macroeconomic model forecasts the U.S. economy and contains over 750 quarterly and annual series of forecast macroeconomic data for both short (3 months) and long (up to 2.5 years) terms.
- DRI offers a macroeconomic model of the U.S. economy to the major portion of its 1,000 clients. The model forecasts 1,100 variables monthly up to 12 quarters and quarterly up to 10 years.

8. OTHER

a. Types

- Classified as "Other" are data bases oriented toward the consumer and data bases not classifiable in one of the above 14 subsectors. Those included here, although not exhaustive, are further indication of the almost unlimited variety of available data upon which to base information services offerings. Data bases included under "Other" are:
 - Properties data bases containing key parameters of known chemical compounds used in chemical engineering for scientific research and environmental protection.
 - Actuarial data bases containing data related to births, longevity, and health.
 - Funding data bases containing textual data on available government and foundation grant programs.
 - Technology data bases containing specialized textual data relating to technology transfer.
 - Travel data bases containing data on such items as airlines, hotel, and automobile reservations and travel plans.
 - Leisure data bases containing data on entertainment and recreation.
 - Personnel data bases containing textual data on qualified employment candidates.
 - Data bases related to maintenance and field service of computers and other communication systems.

- The study identified over 70 data bases, over double that identified in 1980 for an annual growth of 32% for the three-year period.

b. Market Forecast

- The market for "Other" on-line data base services exceeded \$200 million in 1984, as shown in Exhibit IV-29. The market will exceed \$650 million by 1990 as new data bases and services accelerate growth over 21% annually over the forecast period.
- The major portion (74%) of the "Other" data base services is closely tied to information services vendor offerings.
- As shown in Exhibit IV-30, other data base services are widely distributed over industry segments.
- The transportation and services sector (heavily involved in consumer services related to travel, entertainment, and recreation) accounts for over one-quarter of user expenditures to information services vendors.

c. Key Data Bases and Vendor Services

- The National Institute of Health (NIH) and the Environmental Protection Agency (EPA) maintain a number of property data bases as part of the Chemical Information System (CIS). These data bases contain primarily numeric and chemical structural data and are available through the NIH/EPA information network, a facility managed by Interactive Sciences, Inc.
- The Institute of Chemical Engineers maintains a data base of physical properties, vapor-liquid equilibriums, and steam/vapor coefficients. The data bases, together with support software, are offered through GEISCO.

EXHIBIT IV-29

FORECAST OF USER EXPENDITURES FOR
OTHER ON-LINE DATA BASE SERVICES BY VENDOR TYPE
1985-1990

VENDOR TYPE	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Data Base Vendors	\$ 40	\$ 49	\$140	23%
Information Services Vendors	151	195	485	20
Value-Added Network Vendors	11	13	55	20
Total	\$202	\$257	\$680	21%

EXHIBIT IV-30

FORECAST OF USER EXPENDITURES FOR
OTHER ON-LINE DATA BASE
INFORMATION SERVICES BY INDUSTRY SECTOR
1985-1990

INDUSTRY SECTOR	USER EXPENDITURES (\$ Millions)			1985-1990 AAGR (Percent)
	1984	1985	1990	
Transportation	\$ 29	\$ 41	\$ 75	13%
Services	13	18	65	29
Discrete Manufacturing	12	14	30	16
Wholesale	9	12	45	30
Retail/Distribution	8	11	45	34
All Others	80	99	225	18
Total	\$151	\$195	\$485	20%

- The United Communications Group offers the Commerce Business Daily data base of 52 weeks via Tymnet and Telenet. The CBD daily is also offered by Dialog Information Services and Data Resources.
- Inventory Locator Services, a parts locator service for aircraft maintenance, integrates CBD data to provide parts location and anticipated government quantity purchases to its suppliers.
- Digital Equipment is offering a data base of information on DEC-developed software, including third-party software, together with an expert system for on-line search and ordering of software and related services.
- IBM through its Information Network offers two data bases on software associated with IBM operating systems. The data bases cover technical product descriptions, articles produced by IBM, modification letters, program change-level information, access methods, and hardware change-level information.
- EIC/Intelligence offers data base services tracking regulation, domestic and international product development, new research, and events in the telecommunications industry. The Tele/Scope service provides access to primary information from the public utility commission, the FCC, and major corporations in the telecommunications industry. The company offers an integrated system, including a communication terminal display, phone, and access to its data bases.
- There is an expanding market in "Private" data base development.
 - SDC Search has become an FM manager for the U.S. Patent Office, Trademark Division.
 - Quadra Associates has installed its Star system in a number of corporate information centers.

- BRS is offering a minicomputer-based integrated system for in-house data base development.
-
- The in-house on-line data base systems are interfaced with vendors' information services.
- American Airlines (AA) and United Airlines (UAL) offer travel data base services to travel agents.
- Besides interconnecting the reservations data bases of airlines, hotels, and rental cars, travel data base services offer tour information, weather, currency exchange rates, and available entertainment.
- American Express has implemented its own travel information processing systems in over 1,100 offices worldwide. The on-line system offers travelers checks, credit and tour data base services, and customer preference information.

V PRODUCT AND MARKETING ISSUES

V PRODUCT AND MARKETING ISSUES

A. PRODUCT STRATEGIES

- As is shown in Chapter IV, Market Analysis by Data Base Sector, data bases are available from an almost infinite variety of sources.
- Innovation is the key to discovering and developing value-added data base services. Examples are:
 - The ADP Collision Estimating data base service is used for insurance adjustment of the property and casualty insurance industry, product research marketing analysis by the automotive industry, and safety analysis by the federal government.
 - Use of the Commerce Business Daily by Inventory Locator Services, Inc. matches supply and demand for aircraft parts as related to aviation maintenance.
- The shifting emphasis on containing costs in health care services will encourage development of on-line data base services for hospital, surgicenter, rehabilitation center, and convalescent care center services and administration.

- Advanced and enhanced medical diagnosis systems (including X-ray, infrared, and sonic systems) will generate comparative analysis data that can only be efficiently handled by video imaging data base systems.
- Real estate, credit, mortgage, and training data bases are all examples whereby the user in effect creates a high value-added data base in conjunction with information services vendor offerings.
- Data Graph is an example of a government agency (Council on Environmental Quality) contracting with a data base vendor (Sigma Data Services Corporation) to develop and maintain a data base that is then offered on a fee-for-service basis, in this instance by Boeing Computer Services Company.
- Publishers of all types, particularly specialty publishers of information such as industry newsletters, are excellent candidates. NewsNet Inc. has increased its services offerings from 14 to over 150 in less than two years.
- Another product strategy issue is that of data base pricing. As shown in Exhibit V-1, most data base pricing schemes have at least two components:
 - A subscription fee (one-time, annual, minimum, or monthly).
 - An individual data base access fee consisting of access, at times a surcharge based on content value, and, in the case of VANs, a communications fee.
 - Exhibit V-2 describes financial data bases and the information provided by each, along with the basis for fees.
- The proliferation of personal computers, a significant number with hard disk storage, is forcing vendors, particularly with static-type data bases, to revise pricing to accommodate the inevitable downloading of data base subsets while still maintaining revenues and profit margins.

TYPICAL DATA BASE PRICING ARRANGEMENTS FOR ON-LINE DATA BASE INFORMATION SERVICES

DATA BASE TYPE	NAME	DATA BASE VENDOR	INFORMATION SERVICES VENDOR	SUBSCRIPTION COSTS	ACCESSING COST	ROYALTY ARRANGEMENTS
Industry	Livestock	Western Livestock Association	Agridata Network Corporation	\$75.00 plus \$39/month	\$25/hr. - 300 baud \$30/hr. - 1,200 baud	\$4.00/hr. Surchage
Legal/Accounting	Legislative Monitoring	Public Affairs Information, Inc.	Public Affairs Information, Inc.	\$10,000 Annually	\$90/hr. \$45/hr. with 40 hr. minimum	-
News	UPI	United Press International	ITT Dialcom, Inc.	-	\$27.50/hr. Prime \$23.50/hr. 6 p.m. - 6 a.m.	\$11.00/hr.
Securities and Commodities	Commodities Futures	MJK Associates Inc.	MJK Associates Inc.	\$4.00 plus \$40/month	\$16/hr. Prime \$6/hr. nonprime +\$9/hr. Communication	-
Credit	Consumer Credit	Trans Union Credit Co.	Trans Union Credit Co.	-	\$1.50/Credit Report	-
Financial/Economic	Citibase	CitiCorp	NDC/Rapidata	\$100/month	No. Surchage	Subscription Costs
Marketing	Retail Index	A.C. Nielsen	Management Sciences Associates, Inc.	Packaged with Report Services, \$10,000 Additional, Depending on Category	No Surchage	Subscription Costs Paid Directly to A.C. Nielsen

EXHIBIT V-1 (Continued)

TYPICAL DATA BASE PRICING ARRANGEMENTS FOR ON-LINE DATA BASE INFORMATION SERVICES

DATA BASE TYPE	NAME	DATA BASE VENDOR	INFORMATION SERVICES VENDOR	SUBSCRIPTION COSTS	ACCESSING COST	ROYALTY ARRANGEMENTS
Financial/ Economic	Money Markets	Money Market Services, Inc.	Telerate, Inc.	-	\$275/Month for 52 Pages	All Above Telerate System Fees
News	Federal Reserve	Business Publishers Weekly	NewsNet, Inc.	\$15/Month Minimum	\$24/hr. - 500 baud \$48/hr. - 1,200 baud	Not Available
News	Dow Jones News/Retrieval	Dow Jones, Inc.	Dow Jones News/Retrieval	\$50	\$1.20/Min. Prime .20/Min. 6 p.m. - 6 a.m.	-
Legal	LEXIS	Mead Data Central	Mead Data Central	-	\$20/hr. \$9-18/File Group \$8/hr. Communication	-
News	Mercury News	Knight-Ridder Inc.	Knight-Ridder Vutext	\$60/Month or None	\$30-60/hr. \$90/hr.	-
Bibliographic	ABI/Inform	Data Courier Company	Lockheed Information Services	\$50	\$35/hr. plus \$8/hr. Communication	\$10/hr.
Financial/ Economic	Standard and Poor's; Inc.	Standard and Poor's, Inc.	CompuServ	\$50.00 plus 0.25/Company Summary	\$12.50/hr. - 300 baud \$15/hr - 1300 baud \$10/hr. Communication	Subscription Costs

(Continued)

EXHIBIT V-2

FINANCIAL ANALYSIS UTILIZING PERSONAL COMPUTERS AND FINANCIAL AND ECONOMIC ON-LINE DATA BASE SERVICES

FUNCTION	VENDORS				
	CompuServ	Dow Jones Information Services	National Computer Network	The Source	Warner Computer Systems
<ul style="list-style-type: none">● Data Bases<ul style="list-style-type: none">- Company- SEC- News- Bonds- Commodities- Options- Stocks	X X X X X X X	X X X X X X X	X X X X X X	X X X X X	X X X X X X
<ul style="list-style-type: none">● Financial Analysis Software<ul style="list-style-type: none">- Corporate Analysis- Estimated Earnings- Economic Analyses- Commodity Analysis	X X X X	X X X	 X	X	 X
<ul style="list-style-type: none">● Fees<ul style="list-style-type: none">- Subscription	None	\$87/Year	\$30 (Init.)	\$49/Year	\$48 (Init.)
<ul style="list-style-type: none">- Quotes	10¢ to 25¢/Min. + 2¢ to 10¢/ Quote	20¢ to \$1.80/Min. or 1½¢ to 7¢/Quote	15¢ to 45¢/Min. 1/10¢ to 7¢/Quote	14¢ to 43¢/Min. or 1/2¢/Quote	30¢ to \$1.20/Min. or 1½¢ to 2½¢/ Quote
<ul style="list-style-type: none">- Company and Analysts Reports	25¢ to \$10/ Company	15¢ to \$11/ Company	\$1 to \$6/ Company	\$4.50/ Report + On-Line Fees	\$1.50 to \$7/Company + On-Line Fees

- A data base vendor having data bases with high value-added content is still able to require end users to buy a package of services, including data bases, at premium prices.
 - SAMI requires end users to buy report services, usually in excess of \$50,000 annually.
 - Then SAMI charges an additional \$10,000 for either in-house use of the data base or permission to access the data through an information services vendor such as the Telmar Media Group.
- By combining proprietary software, either on the mainframe or more recently as separately offered access and analysis packages on personal computers, information services vendors add value to their on-line data base offerings.
 - CACI, Inc. offers Site II, a demographic data base coupled with access, analysis, and report generation software. An additional offering, Site Potential, reorganizes the same data and other data structures for deriving sales potential.
 - Lloyd Bush and Associates offers a GINNIE MAE (GNMA) data base, together with analysis software for a portfolio analysis, hedging, and secondary mortgage market participation, both directly and through CDC/BIS.
- Use of the pricing mechanisms of loading connect time and surcharging CPU resource units is on the decline due to two factors:
 - The proliferation of personal computers and intelligent workstations that are capable of sophisticated computation as well as downloading of significant data base segments.

- Higher line speeds of up to 4,800 baud, which reduce connect time.
- Other pricing trends are as follows:
 - A switch from connect time to data base items accessed is occurring.
 - Intelligent workstations can cause one-half minute connect.
 - The CPM watches the output writing, providing automatic monitoring.
 - PC use influences the pricing basis.
 - Transmission baud rate is increasing to 2,400 and above.
 - Intelligent modems are becoming cost-effective.
 - Surcharges are being made for user friendly access and analysis software.
 - Differentials are given for off-peak access.
 - Discounts are given for corporate volume.
- Information services vendors are increasing revenue through the sale of micro-driven application software and as value-added vendors of integrated systems.
- The rising profitability of this market is seen in the pre-tax operating margin comparisons displayed in Exhibit V-3.
 - By 1983, business information services had an average pre-tax operating income of 21%, compared to newspaper publishing which had the next highest margin of approximately 18%.

EXHIBIT V-3

PRE-TAX OPERATING MARGINS FOR BUSINESS INFORMATION INDUSTRY

INDUSTRY SEGMENT	PRE-TAX OPERATING INCOME (Percent)				
	1979	1980	1981	1982	1983
Business Information Services	16.2%	16.1%	18.1%	19.2%	21.0%
Newspaper Publishing	17.1	16.3	16.3	15.7	18.3
Book Publishing	12.1	11.2	10.1	10.1	10.2
Consumer Magazine Publishing	9.3	8.3	9.6	9.9	8.9
Business Magazine Publishing	13.2	12.5	11.6	11.9	13.9
Industry Averages	14.7%	14.3%	14.6%	14.5%	16.3%

Source: 85 Companies, Industry Report (VS & A).

- The lower margins in publishing pushed the industry average down to just over 16%.
- Data base vendors, better aware of data content value, are raising subscription prices and basing royalties upon data base subsegment access and item "hits" (i.e., items displayed or selected for computation).
- The personal computer and intelligent workstation are revolutionizing the way information services vendors are offering on-line data base services. Over 80% of the vendors interviewed were offering or planned to offer microprocessor access search and analysis software utilizing the IBM PC and other personal computers.
 - Many offerings have the capability of downloading data base segments onto hard disks.
 - Some vendors offered the capability to interface with widely available personal computer software such as Lotus 1-2-3 and spreadsheet analysis packages.
 - Vendors such as Computstat, DRI, BEST, and Dow Jones were offering data base segments on flexible disks for use on personal computers.
- Data base vendors are increasingly turning to the use of VANs and giving up on information services vendors for end-user delivery of their data and value-added access and analysis software. By announcing VANs, information services vendors, such as ADP and GEISCO, will add impetus to the proliferation of on-line data base services.
- IBM and AT&T are both intensely interested in the delivery of on-line information services to the corporate and consumer marketplace.

- AT&T, in spite of temporary roadblocks, will be successful in delivering "Yellow Pages-like" information services from data bases created and maintained by the BOCs.
 - IBM is intensely interested in on-line services in the insurance industry.
 - IBM, in a joint venture with Sears and CBS, is approaching the consumer marketplace with a wideband communications concept, easily accommodating information data base services.
 - IBM, in a joint venture with Merrill Lynch, is planning to deliver real-time securities and commodities information services to security brokers and individuals.
-
- Knowledge-based systems tend to utilize large data bases of information in synthesizing responses to user requests. INPUT expects that the successful implementation of knowledge-based systems in selected areas will greatly expand the market for on-line data base services.
 - Software programs that provide gateways to a variety of data bases and vendor services operating on personal computers will become the "VisiCalc" of the on-line data base marketplace.
 - Now in various stages of development or pilot programs are products for the emerging videotex market. Although somewhat slow to gain acceptance, the potential of videotex for distributing both consumer and business services is enormous.
 - The primary reasons this market could explode are the vast networks represented by telephone equipment and cable television already in place.
 - A factor which has, however, dampened user enthusiasm in some trials is the use of special expensive terminals.

- Opportunities are in both NAPLPS (graphics) and ASCII (text) based systems with some interesting niches in NAPLPS now developing. Current systems are mostly ASCII based.
- Trends which appear to be accelerating development are an orientation toward end users and software that is menu-driven, giving easy access to system functions.
 - Credit card payment systems dominate the current market.
 - There is a shift from targeting consumers to providing service for small business users.
- Strategies are emerging which could result in great market success for some participants. Primary among these is service distribution through the PC-installed base rather than with custom-designed terminals. Also showing promise:
 - Offering services to businesses during the day and stressing consumer services at night.
 - Closed network services for large user groups.
 - A focus on financial, transactional, and specific information services.
 - Watching for federal, state, and local projects that will depend on videotex distribution.
- Exhibit V-4 describes current services and others in development. CompuServ leads the emerging market with some 200,000 users.

EXHIBIT V-4

THE EMERGING VIDEOTEX MARKET

● Major National Services

SERVICE	USERS	1984 REVENUES (\$ Million)	PRICING (Start Up/Monthly Minimum/Prime Time \$/Evening \$)
CompuServ	200,000	\$25	\$39.95/--/12.50/6*
The Source	70,000	\$10	\$49/95/10/20.75/7.75*
Knowledge Index (Dialog)	10,000	\$ 5	\$35/--/--/\$24
BRS/After Dark	8,000	\$ 3	\$75/12/--\$6-20
DELPHI (Gen. Videotex)	8,000	N/A	\$49.95/--/16/6
VIEWTRON+ (Knight-Ridder)	6,000	\$ 1	\$9.95/--/\$13/\$5

*1200 based services

● New Services under Development

- TRINTEX (IBM/Sears/CBS)
 - Under Development - 1 Year
 - NAPLPS Protocol Based
 - \$250 Million Capitalization
- COVIDEA (AT&T, B of A, Chemical Bank, Time Inc.)
 - Recently Announced
 - ASCII Portocol Based
 - Banking and Information Services to Small Businesses

B. MARKETING ISSUES

- It is essential that marketing personnel involved in the sale of on-line data base services be knowledgeable in end-user needs and solutions using specific data base products. For example, consultants versed in media advertising are essential for selling marketing data base services to advertising agencies, corporate advertising departments, or regional marketing managers.
- Graduates with an excellent background in quantitative analysis and financial and economic data bases are a good source of technical personnel for offering services to financial markets.
- Graduates trained in library sciences (in excess supply because of a Proposition 13-like state and county environment) are potential sources of technical expertise for offering bibliographic and text data base services.
- Information services vendors would do well to use the technical and consulting expertise of data base vendors (including the proprietary software available for personal computers) as the specific technical support necessary for the successful marketing of specialized on-line data base services.
- Information services vendors, particularly educational and publishing corporations, have been using the acquisition of specialty data base firms as a way to obtain market presence as well as qualified personnel for information services marketing operations.
- The personal computer is capable of (through windowing and menus) a degree of computer-aided instruction, smoothing the way for increased use of on-line data base services by otherwise reluctant end users.
- The on-line information services marketplace has become large enough to sponsor its own regional and national conventions. The national conventions,

still heavily tilted toward bibliographic and information storage and retrieval, are a place where major product announcements and demonstrations across many data base sectors are presented, resulting in good follow-on press coverage.

- Information services vendors are beginning to shift from the supermarket approach to emphasizing exclusivity in product lines for their on-line data base services offerings.
- Most successful vendors (like Quotron Systems, Telerate, and Mead Data Central) offer on-line data base services packages as a total system: data bases, software, networking, terminals, and maintenance.
- INPUT believes that data base vendors will join the mass advertising bandwagon of the PC and PC software vendors to increase potential user awareness of product and services offerings.
- Data base and information services vendors should consider distributing segmented data bases and personal-computer-related software through commercial channels.

VI COMPETITIVE ENVIRONMENT

VI COMPETITIVE ENVIRONMENT

A. COMPETITIVE STRUCTURE

- Competition in the market for on-line data base information services is among three vendor types:
 - Type one consists of data base vendors producing and maintaining data bases for license either directly to end users or through information services vendors. Data base vendors offering data bases on-line to users through their own networks or through value-added service vendors are considered information services vendors in this study.
 - Type two consists of information services vendors offering on-line to end users either their own data bases or licensed data bases from data base vendors. Information services may be delivered through their own networks and/or value-added network vendors. The services may include software products and integrated systems.
 - Type three consists of value-added network vendors able to reach widely disbursed end users by means of value-added network (VAN) services.

- The definition of vendor types is clearly blurring.
 - Data base vendors are offering their data bases directly, either by establishing their own networks or by utilizing VANs and becoming information services vendors.
 - In addition to developing their own data bases, information services vendors such as ADP and GEISCO are offering their own VAN services.
 - With entry into the information services marketplace, AT&T and IBM are beginning their own on-line information services to end users.
- The study identified over 600 vendors participating in the U.S. marketplace.
 - Over 150 data base vendors (a 35% annual growth over three years).
 - Over 450 information services vendors (a 40% annual growth over three years).
 - Eleven value-added network vendors (a 50% annual growth over three years).
- The market is widely shared. Although some vendors hold major portions of selected on-line data base market segments, no one vendor controls even 10% of the total market.
- The \$2.5 billion 1984 market for on-line data base information services is shared among vendor types as follows:
 - \$490 million or 20% is data base vendors.
 - \$1,990 million or 80% is information services vendors.

- Some \$65 million or 3% of the total may also be classified as value-added networks.
- As shown in Exhibit VI-1, 26 data base vendors, approximately 17% of the total identified, account for just over 80% of total revenues in that market segment.
- Total data base subscription revenues are highest (27%) for marketing data bases. Data base vendors involved in gathering data on consumer markets are still able to tie print services to the high royalty arrangements for on-line data base subscription and access.
- Some vendors are diversified in the types of data bases they offer. Major vendors as a group have data base subscription revenues totaling 14% of the market. Most of the information provided is in the form of historical and numerical data associated with financial, industry, resources, and international data bases.
- Vendors providing large volumes of real-time trading data from the major stock and commodity exchanges directly to securities and commodities on-line information services vendors form another important data base group. Three vendors account for 7% of total data base subscription revenues.
- High value-added data bases are found in the credit subsector where two vendors represent 7% of the total market and in the financial corporate information sector where revenues of three vendors represent another 7% of the market.
- Some 32 information services vendors, approximately 7% of total vendors identified, represent, as shown in Exhibit VI-2, nearly 94% of total revenues for the information services segment for the market for on-line data base services.

EXHIBIT VI-1

DATA BASE VENDORS' SHARE OF
ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES (\$ Millions)	MARKET SHARE (Percent)
McGraw-Hill/DRI	Diversified	\$ 24	
Chase/IDC	Diversified	18	
CISI/WEFA	Diversified	9	
Disclosure Inc.	Diversified	7	
Evans Economics	Diversified	10	
	Subtotal	\$ 68	14%
Dow Jones, Inc.	Securities & Commodities	30	
Associated Press	Securities & Commodities	20	
Commodity Information Services Company	Securities & Commodities	5	
	Subtotal	\$ 55	11%
S&P CompuStat	Financial & Economic	10	
Value Line Inc.	Financial & Economic	8	
Telstat, Inc.	Financial & Economic	15	
	Subtotal	\$ 33	7%
CDC/Arbitron	Marketing	25	
A.C. Nielsen	Marketing	80	
SAMI	Marketing	20	
Simmons Market Research	Marketing	8	
	Subtotal	\$ 133	27%

(Continued)

EXHIBIT VI-1 (Cont.)

DATA BASE VENDORS' SHARE OF
ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES (\$ Millions)	MARKET SHARE (Percent)
CACI, Inc.	Demographic	\$ 6	
Urban Decisions, Inc.	Demographic	4	
National Data Planning, Inc.	Demographic	3	
	Subtotal	\$ 13	3%
Standard and Poor's, Inc.	Credit	18	
National Association of Credit Managers	Credit	16	
	Subtotal	\$ 34	7%
Data Courier, Inc.	Bibliographic	6	
Predicasts, Inc.	Bibliographic	7	
Information Access Co.	Bibliographic	6	
IEEE	Bibliographic	4	
	Subtotal	\$ 23	5%
NewsNet	News	8	
Money Market Services	News	8	
IMS America, Ltd.	Medical	20	
Chemshare Co.	Properties	8	
	Subtotal	\$ 44	9%
Others	Diversified	\$ 87	17%
Total	Total	\$490	100%

EXHIBIT VI-2

INFORMATION SERVICES VENDORS' SHARE OF
ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES (\$ Millions)	MARKET SHARE (Percent)
McGraw-Hill/DRI/Monchik-Weber	Diversified	\$ 90	
Chase/IDC	Diversified	90	
ADP	Diversified	65	
D&B/NCSS	Diversified	75	
CDC/BIS	Diversified	60	
GEISCO	Diversified	100	
NDC/Rapidata	Diversified	35	
	Subtotal	\$515	25%
Quotron	Securities & Commodities	140	
ADP	Securities & Commodities	40	
Allied Information Systems	Securities & Commodities	60	
Dow Jones	Securities & Commodities	40	
	Subtotal	\$280	14%
Mead Data Central	News	40	
Telerate	News	75	
Dow Jones,	News	60	
Reuters, Ltd.	News	40	
	Subtotal	\$215	11%

(Continued)

EXHIBIT VI-2 (Cont.)

INFORMATION SERVICES VENDORS' SHARE OF
ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES (\$ Millions)	MARKET SHARE (Percent)
TRW Information Services	Credit	\$ 62	
Trans Union Credit Co.	Credit	55	
EQUIFAX	Credit	63	
Telecredit	Credit	68	
Tymshare	Credit	25	
National Data Corporation	Credit	20	
Chilton Co.	Credit	30	
CSC Credit	Credit	17	
Dun & Bradstreet	Credit	115	
	Subtotal (460)	\$455	22%
OCLC	Bibliographic	55	
Lockheed Information Services Company	Bibliographic	45	
SDC Information Services Co.	Bibliographic	20	
BRS	Bibliographic	12	
	Subtotal	\$132	7%
Mead Data Central	Legal	95	
Westlaw Co.	Legal	35	
	Subtotal	\$130	7%

(Continued)

EXHIBIT VI-2 (Cont.)

INFORMATION SERVICES VENDORS' SHARE OF
ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES (\$ Millions)	MARKET SHARE (Percent)
Telmar Media Group Interactive Marketing A.C. Nielsen	Marketing	\$ 15	
	Marketing	12	
	Marketing	30	
	Subtotal	\$ 57	
Planning Research Corp. Realtron, Inc. Real Estate Data, Inc.	Real Estate	42	
	Real Estate	12	
	Real Estate	20	
	Subtotal	\$ 74	
Others Diversified	Diversified	\$ 135	7%
Total		\$1,993	100%

- Vendors offering a wide variety of data base services across many of the 15 data base market subsegments (such as econometric, financial and economic, industry, and international) form the major group, accounting for 25% of the total market segment.
- Vendors offering credit data base services to both commercial and consumer markets (with 22% of information services data-base-related revenues) are the most important specialty group.
- In another important specialty area (securities and commodities data base services offered in real-time to support securities exchange trading operations), the four major vendors constitute 14% of the information services vendor segment total.
- Revenues of four vendors offering on-line news data base services (a rapidly growing market) represent another 11% of the information services vendor market segment.
- Nearly half of the information services revenues for bibliographic data base services (7% of total revenue shared by four vendors) goes to the Ohio Cooperative Library Corporation, a nonprofit venture. Revenues for bibliographic data base services supplied by the federal government are not included in this study.

B. KEY VENDORS AND PRODUCTS

- Key data bases and vendor services for each data base market subsector are presented in Chapter IV, Market Analysis by Data Base Sector.
- The information presented below illustrates the products and offerings of key vendors from an integrated viewpoint across data base market subsectors.

I. MEAD DATA CENTRAL

- With 1984 revenues approaching \$135 million and an annual growth of 35%, Mead Data Central is rapidly becoming the largest vendor of on-line data base services in the marketplace.
- Mead first created LEXIS, legal data base services (100,000 current active users), and next offered NEXIS, news data base services (30,000 active users). There has been an increase in user of over 30% over 1984. Mead is now rapidly expanding into business information services with The Exchange and is also now offering medical information services. MEDIS (Medical Reference Data Bases) was recently launched.
 - Data bases offered number 150, representing 50% growth. Data base size is in the 100 billion character range.
- With over 100,000 users, MDC operates its own telecommunications network (MeadNet), supplies its own dedicated terminals, and is shifting to offering the IBM PC and compatibility with IBM DisplayWriter and 3101 terminals.
- Expanded full text service, new software architecture, and user friendliness are recent service improvements.
- Expanding its market base, MDC has recently revised its pricing structure significantly downward. Pricing will consist of separate charges:
 - Connect time charges have been eliminated.
 - A fixed search cost will depend on the file accessed, beginning at \$9 per search. Search prices were increased 12% to cover giving up connect time.

- VAN charges averaging \$8 per hour.
- A 50% discount for use during off-peak hours.

2. LOCKHEED/DIALOG

- Dialog Information Services is the largest of the commercial bibliographic information services vendors. It offers over 230 data bases, an increase of 15%, sized at approximately two billion characters. Dialog is:
 - Increasing use of full text.
 - Providing full-service data base "supermarkets."
 - Supporting numeric data bases.
 - Providing user friendly systems software.
 - Revising and improving access and retrieval software. New Insearch is provided and Prosearch has been enhanced.
 - Providing DialNet, a VAN. The first phase in 55 major cities has been completed.
 - Providing electronic mail.
 - Interfacing with the IBM PC.
 - Providing interface with corporate information centers on a CPU-to-CPU basis.
- With an excess of 90,000 subscribers, 1984 worldwide revenues exceeded \$45 million for a growth rate of 29%. Active users number 25,000 during the days and 10,000 at night.

3. TELERATE, INC.

- Telerate offers an on-line financial network that provides subscribers with current financial news and data. The supply of time-critical information--numbers, analysis, opinion--is Telerate's key strategy.
- Telerate provides its own data bases and provides the opportunity for other vendors to offer financial information services by purchasing "Pages." There are 600 page contributors.
- The company supplied its own specialized terminals, which received information in a broadcast-select mode. Telerate's latest offering, TeleRate II, a microprocessor-based terminal, allows downloading of information and financial analysis using widely available PC software products. The special terminals are being phased out.
- With 1984 revenues exceeding \$75 million and an annual growth of 50%, Telerate provides services for approximately 23,000 users in 39 countries worldwide.
- The company is being acquired at a very high multiple by Dow Jones.

4. DOW JONES

- Dow Jones represents a successful combination of financial and information data bases with PC access and analysis of software.
- With more than 130,000 subscribers and growing more than 50% annually, Dow Jones offers financial and news data services to the corporate marketplace through quotation vendors such as Quotron and to individuals utilizing personal computers through its news/retrieval service.

- Data bases now number:
 - Six stock and commodity quotes market average data bases.
 - Fourteen company/industry data bases.
 - Sixteen other general public data bases.
- In addition to carrying articles from the Wall Street Journal, Barrons, and the Dow Jones News Service, Dow Jones is offering other vendor data bases, such as Disclosure II and Media General, as well as world news, sports, and weather reports.
- Dow Jones markets its own access and search software for the IBM PC, and also widely available micro software packages for conducting financial analysis, word processing, and other financial office automation functions.
- PC software programs total:
 - Six investment programs.
 - Three data analysis/communications programs.
 - One sales analysis program.
- Information services revenue approached \$80 million in 1983, 60% of which is estimated to be related to its "Broad Tape" and News/Retrieval on-line data base services.
- Dow Jones has recently simplified access and use charges.
 - Prime time \$0.90/minute—300 baud, 2X for 1,200 or 2,400 baud.

- Other \$0.20/minute--300 baud, 2X for 1,200 or 2,400 baud.
- Surcharges for access of proprietary data bases (i.e., \$0.30/minute surcharge for DJ News, OAG).

5. TRW INFORMATION SERVICES

- TRW specializes in credit on-line data base services. TRW supplies consumer credit services to over 20 of its own credit bureaus and another 50 independent credit businesses.
- TRW consumer credit data bases contain credit data on approximately 85% of all U.S. households. Utilizing corporate credit information from the National Association of Credit Managers and Standard and Poor's, TRW offers an automated national credit information service to nearly 1,000 users.
- TRW is utilizing information contained in its data bases to expand in other areas, such as product advertising and consumer mortgage markets.
- Total 1983 related revenues of \$55 million were divided between:
 - \$12 million in business credit, growing 12% annually.
 - \$43 million in consumer credit, growing 25% annually in an expanding economy.
- TRW revenues from credit data bases in 1984 exceeded \$62 million.

6. GEISCO

- With its international network, GEISCO is a leading vendor of on-line data base services to multinational corporations.

- GEISCO obtains data bases primarily through licensing arrangements with data base vendors. Nearly 50 data bases are offered in seven data base sectors.
- GEISCO targets industry data bases with analysis software in the discrete manufacturing and process manufacturing industry sectors.
- With over 6,000 clients worldwide, 1984 information services revenues related to on-line data base services exceeded \$100 million.

7. DUN & BRADSTREET

- Through its information services subsidiary, Dun & Bradstreet Computer Services, Inc., and through direct offerings through VANs, Dun & Bradstreet is rapidly expanding into the on-line data base information services marketplace and is now emphasizing the marketing of financial business information.
- Corporate credit information services are offered to well over 10,000 users, with annual growth exceeding 50%.
- The Official Airline Guide, currently offered through five information services vendors, has recently been made available directly.
- Other data base offerings are:
 - D&B—Dun's Market Identifiers, Million Dollar Directory, and Principal International Directory, all on Dialog information services.
 - Dun's Quest—containing descriptive financial data on over a million U.S. companies, offered directly.
 - Six marketing, demographic, and profile data bases offered by Donnelly Marketing Information Services through Dun & Bradstreet Computer Services (NCSS).

- Dun & Bradstreet acquired A. C. Nielson in 1984.
- 1984 revenues of \$2.4 billion reflect a 16% real annual growth (restated).
- In 1985, the company went on an acquisition binge with the following purchases:
 - Southern States Directory Company (Florida).
 - Oklahoma Telephone Directories Inc.
 - US Travel Operations of Thomas Cooke (England).

8. McGRAW-HILL, INC.

- McGraw-Hill, through its subsidiary DRI and directly, is showing an increasing presence in the on-line data base services marketplace.
- Data Resources (DRI) offers perhaps the most extensive set of economic and econometric data base services.
 - Over 80 data bases in six data base sectors, including financial-economic, econometric, industry, international, and demographic, are compiled and maintained primarily by DRI.
 - Data bases obtained by license from data base vendors include:
 - CompuStat.
 - Platts' Oil Data Bank.
 - Green Markets Data Bank.

- JD Power Data Bank on consumers and the automobile industry.
- ValueLine.
- Standard and Poor's Industry Financial Data Bank
- Distributed processing is through a new IBM PC-compatible software and services offering.
- BudgeTrack (a data base that tracks the status of unclassified DOD, NASA, and DOT appropriations for research and development procurements) is offered through DRI.
- The Metals Week Data Base covers prices and movement for over 50 major nonferrous metals. It is licensed to Chase/IDC and also offered through DRI.
- Shepard's Citations on case history law are licensed to both Mead Data Central and West Publishing Company.
- Dodge Construction Potentials Data Bank, containing national data on construction projects, is available through DRI.
- Total McGraw-Hill on-line data base information services revenues were estimated to be in excess of \$340 million in 1984.
- McGraw Hill has recently reorganized to strengthen leadership as a supplier of information on-line to industry, the professions, government, and education, forming two new subsidiaries and making a number of acquisitions.
- The acquired new companies are:
 - Monchik-Weber - financial services.
 - Future Computing - personal computer forecasting.

- CYMA Corporation - software development.
- Educational Services - education software.
- Center for Communications Management - telecommunications.
- McGraw-Hill Financial and Economics Information Company was established with an emphasis on the PC as a delivery mechanism to include:
 - Standard and Poor's, Compustat, Inc.
 - Data Resources, Inc.
 - Monchik-Weber Corporation.
- The information systems company includes:
 - Sweets.
 - Datapro.
 - Fourteen hundred dial-up data bases.
 - Cost information systems design estimator PC software to become available.

9. AMERICAN EXPRESS

- American Express participates with a credit data base and has explored other product types.

- Recently it acquired the remaining 25% stock of First Data Resources for \$255 million.
- The company's 1980-1985 AAGR was greater than 40%.
- American Express is shedding unrelated businesses:
 - Selling cable T.V.
 - Reducing exposure in property-casualty insurance.
- The company plans to refocus on customer-oriented financial services; for example, on-line interactive data base financial and business services.

10. AT&T

- AT&T could be a strong competitor with its strength in communications technology and installed transmission systems.
- The company is in a joint venture with Quotron System to develop and market computer-aided financial information systems. Quotron had 1984 data base revenues of \$140 million.
- Its videotex offerings are based on hardware built in-house:
 - Frame Creation Systems Series 300 and 350.
 - AT&T 6700 IBM-compatible PC.

11. IBM

- IBM has shown an interest in on-line networks services as a supplier recently.

- The company acquired 16% interest in MCI.
- IBM introduced corporate videotex.
 - PC/videotex - \$2,500.
 - Videotex 370 - \$75,000.
 - North American Presentation Level protocol-based.
- IBM is a partner in several joint ventures. Among its partners are:
 - Merrill Lynch for security and commodities quotation services.
 - CBS/Sears for TRINTEX videotex services.
- IBM also offers network services for casualty and property insurance independent agents.

12. KNIGHT-RIDDER NEWSPAPERS

- Knight-Ridder is another publisher who hopes to become a leader in integrated data base production/distribution. Already the company offers services in four sectors:
 - Security/commodity services.
 - Commodity News Service: For commodity and future markets.
 - Commodity Perspective, Commodity Research Bureau: On-line chart services.

- Tradecenter: Realtime graphic price information for financial community (170 leading brokerage houses and banks).
 - Money Center: New on-line data base of government debt, foreign exchange, and money market instruments.
- New services:
 - Vy/Text: On-line fulltext data base of 20 newspapers, three wire services, and several other business reference data bases.
 - KNT News Wire (joint venture with Tribune Company): 160 subscribing newspapers.
- Industry services:
 - Journal of Commerce Shipping Data Bases: PIERS (Port Import/Export Reporting Service) and RATES (Rapid Access Tariff Expediting Service).
- Consumer services:
 - Viewtron: The nation's first national consumer videotex service. Viewtron will include a national service with access via IBM and other PCs. Current subscribers number over 6,000.
- Total subscribers to Knight-Ridder services number over 51,600.

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

- INFORMATION SERVICES - The provision of:
 - Data processing functions using vendor computers (processing services).
 - The provision of data base access where computers perform an essential role in the processing or conveyance of data.
 - Services that assist users to perform functions on their own computers (software products and/or professional services).
 - A combination of hardware and software integrated into a total system (integrated systems).

A. REVENUE

- All revenue and user expenditures reported are available (i.e., noncaptive) revenue, as defined below.
- NONCAPTIVE INFORMATION SERVICES REVENUE - Revenue received for information services provided within the U.S. from users who are not part of the same parent corporation as the vendor.

- CAPTIVE INFORMATION SERVICES REVENUE - Revenue received from users who are part of the same parent corporation as the vendors.
- OTHER REVENUE - Revenue derived from lines of business other than those defined above.

B. SERVICE MODES

- PROCESSING SERVICES - Remote computing services, batch services, and processing facilities management.
 - REMOTE COMPUTING SERVICES (RCS) - Provision of data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. There are four submodes of RCS:
 - INTERACTIVE (timesharing) - Characterized by the interaction of the user with the system, primarily for problem-solving timesharing but also for data entry and transaction processing; the user is on-line to the program/files.
 - REMOTE BATCH - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.
 - DATA BASE - Characterized by the retrieval and processing of information from a vendor-provided data base. The data base may be owned by the vendor or a third party.
 - USER SITE HARDWARE SERVICES (USHS) - These offerings provided by RCS vendors place programmable hardware on the user's site (rather than in the EDP center). USHS offers:

- Access to a communications network.
 - Access through the network to the RCS vendor's larger computers.
 - Significant software as part of the service.
- BATCH SERVICES - This includes data processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as key-punching and computer output microfilm processing, are also included. Batch services include those expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing.
 - PROCESSING FACILITIES MANAGEMENT (PFM) (Also referred to as "resource management" or "systems management") - The management of all or a major part of a user's data processing functions under a long-term contract (more than one year). This would include both remote computing and batch services. To qualify as PFM, the contractor must directly plan, control, operate, and own the facility provided to the user, either on-site, through communications lines, or in a mixed mode.
- Processing services are further differentiated as follows:
 - Function-specific services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general ledger, accounts receivable, payroll, and personnel applications fall into this category. Function-specific data base services where the vendor supplies the data base and controls access to it (although it may be owned by a third party) are

included in this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific.

- Industry-specific services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications "tool" that the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation. Industry-specific data base services, where the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry-specific applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.
- Utility services are those where the vendor provides access to a computer and/or communications network with basic software that enables users to develop their own problem solutions or processing systems. These basic tools include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.
- SOFTWARE PRODUCTS - This category includes user's purchases of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures as well as fees for work performed by the vendor to implement and maintain the package at the user's sites. Fees for work performed by organizations other than the package vendor are counted in professional services. There are several subcategories of software products.

- APPLICATIONS PRODUCTS - Software that performs processing to service user functions. These consist of:
 - CROSS-INDUSTRY PRODUCTS - Used in multiple user industry sectors. Examples are payroll, inventory control, and financial planning.
 - INDUSTRY-SPECIFIC PRODUCTS - Used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.
- SYSTEMS PRODUCTS - Software that enables the computer/communications system to perform basic functions. They consist of:
 - SYSTEMS CONTROL PRODUCTS - Function during applications program execution to manage the computer system resource. Examples include operating systems, communication monitors, emulators, and spoolers.
 - DATA CENTER MANAGEMENT PRODUCTS - Used by operations personnel to manage the computer system resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.
 - APPLICATION DEVELOPMENT PRODUCTS - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include languages, sorts, productivity aids, data dictionaries, data base management systems, report writers, project control systems, and retrieval systems.

- PROFESSIONAL SERVICES - Made up of services in the following categories:
 - EDUCATION SERVICES - EDP products and/or services - related to corporations, not individuals.
 - CONSULTING SERVICES - EDP management consulting and feasibility studies, for example.
 - SOFTWARE DEVELOPMENT - Including system design, contract programming, and "body shopping."
 - PROFESSIONAL SERVICES FACILITIES MANAGEMENT (PSFM) - The counterpart to processing facilities management, except that in this case the computers are owned by the client, not the vendor; the vendor provides people to operate and manage the client facility.
- INTEGRATED SYSTEMS (Also known as Turnkey Systems) - An integration of systems and applications software with hardware, packaged as a single entity. The value added by the vendor is primarily in the software. Most CAD/CAM systems and many small business systems are integrated systems. This does not include specialized hardware systems such as word processors, cash registers, and process control systems.
- Integrated systems revenue in this report are divided into two categories.
 - INDUSTRY-SPECIFIC systems, i.e., systems that serve a specific function for a given industry sector such as seismic processing systems, automobile dealer parts inventory, CAD/CAM systems, discrete manufacturing control systems, etc.
 - CROSS-INDUSTRY systems, i.e., systems that provide a specific function that is applicable to a wide range of industry sectors such as financial planning systems, payroll systems, personnel management systems, etc.

- Revenue includes hardware, software, and support functions.

C. DATA BASE

- DATA BASE - An organized collection of information. The data base may contain a collection of time series and numeric data, a collection of indexed or full-textual data, or a combination of both. Some data bases are beginning to contain textual and image data. Data bases contain principally historical information, but they may also contain real (or near-real) time data and, in special circumstances, forecasted data. Data bases may be either in printed form or, increasingly, automated and machine-processible form.
- ON-LINE DATA BASE - Data bases that are available for on-line access by users through information services and value-added network vendors where access is by computer terminal, personal computer, or a micro-controlled word processing system.
- DATA BASE VENDOR - Data bases are produced and maintained by vendors who frequently produce the data base as a by-product of electronic publishing. In addition to offering the data in the form of printed publications, the vendor offers the computer-readable data base either directly (often on-line) or, more frequently, through information services vendors. For using data bases on-line, data base vendors charge subscription fees, collect use royalties, or do both. Charges may either be direct to the end user or through licensing arrangements with information services vendors.
- INFORMATION SERVICES VENDORS - Information services vendors offer data bases that they build and maintain themselves, license from data base vendors, or both. Data base vendors who offer data bases on-line to end users (either through their own network or via value-added network vendors) are considered information services vendors in this report.

- VALUE-ADDED NETWORK VENDORS - Value-Added Network (VAN) vendors offer data telecommunication services, usually in the form of packet switching networks between data base vendors and, in some instances, information services vendors and end users, usually in widely dispersed areas. There are a number of information services vendors, including GEISCO, ADP, and DRI. These, in addition to Tymnet, Telenet, and Uninet, offer VAN services between data base vendors and end users.

D. OTHER CONSIDERATIONS

- When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint. Expenditures are then categorized according to the answer to what the users perceive they are buying.
- The standard industrial classification (SIC) codes are used to define the economic activity contained in generic sectors such as Process Manufacturing, Insurance, Transportation, etc.

APPENDIX B: RELATED INPUT REPORTS

APPENDIX B: RELATED INPUT REPORTS

- U.S. Information Services Markets, 1983-1988, Volumes I and II, December 1983.
- Impact of Upcoming Optical Memory Systems, April 1983.
- Personal Computers in the I.S. Strategy, December 1982.
- Western European Market Opportunities for On-Line Data Base Services, June 1981.
- Market Opportunities for Data Base Services, July 1980.

APPENDIX C: QUESTIONNAIRE

VENDOR QUESTIONNAIRE
ON-LINE DATA BASE INFORMATION SERVICES

1. Discuss the types of products/services you offer.

Services : _____

Data Bases : _____

2. What markets do you serve? ☐ Industry-Specific ☐ Cross-Industry

3. How large in terms of revenues do you think each of the markets you serve is? ☐ <\$100M ☐ \$100-500M ☐ >\$500M _____

4. How fast are these markets growing (annually)? ☐ < 20% ☐ 20-30%
☐ >30% _____

5. What are your best estimates of the revenues you derive from the markets you serve? ☐ <\$1M ☐ \$1-5M ☐ \$5-20M ☐ >\$20M _____

6. What portion of total revenues is derived from:

- | | |
|---|---------|
| <input type="checkbox"/> Data Base Subscriptions | _____ % |
| <input type="checkbox"/> Data-Base Related Access | _____ % |
| <input type="checkbox"/> Professional Services | _____ % |
| <input type="checkbox"/> Communications | _____ % |
| <input type="checkbox"/> Other _____ | _____ % |

TOTAL	100%
-------	------

7. What about your annual growth as compared to the overall market?

☐ Less ☐ Same ☐ Greater _____ %

8. What is your best estimate of the share of each of the markets you serve?
☐ <10% ☐ 10-30% ☐ >30% _____

9. Who are your major (3-4) competitors, and how do they rank in each of the markets you serve?

COMPETITOR	MARKET	RANK	COMMENTS

10. Who are the buyers/users of the services/products you offer (titles, functions)?

Buyers: _____

Users: _____

11. What types of hardware do you offer in conjunction with your service?

- ☐ None
- ☐ Intelligent terminals/micro-based workstations

- ☐ Personal Computer (DEC, IBM, Apple, H-P, _____ (Circle))

12. To what extent is technology affecting your markets or delivery system?

- ☐ Personal Computers ☐ Optical Storage ☐ Telecommunications
- ☐ Pricing

13. What types of software aids are necessary to use as part of the service/product you offer? ☐ None

14. Which, if any, of your products/services is/are offered as integrated systems?
☐ None ☐ Personal Computers

15. How are the offered data bases created or updated?

16. How are your on-line data bases and services priced?

17. How many users do you serve with each of your product offerings?
 What are the major industries served?

18. What new market areas do you see for your data-base-related products/ services? Any newly announced products?

19. What major changes do you see taking place in the information data base marketplace in the next five years (1984-1989)?

20. Available literature being sent?

☐ Yes ☐ No

